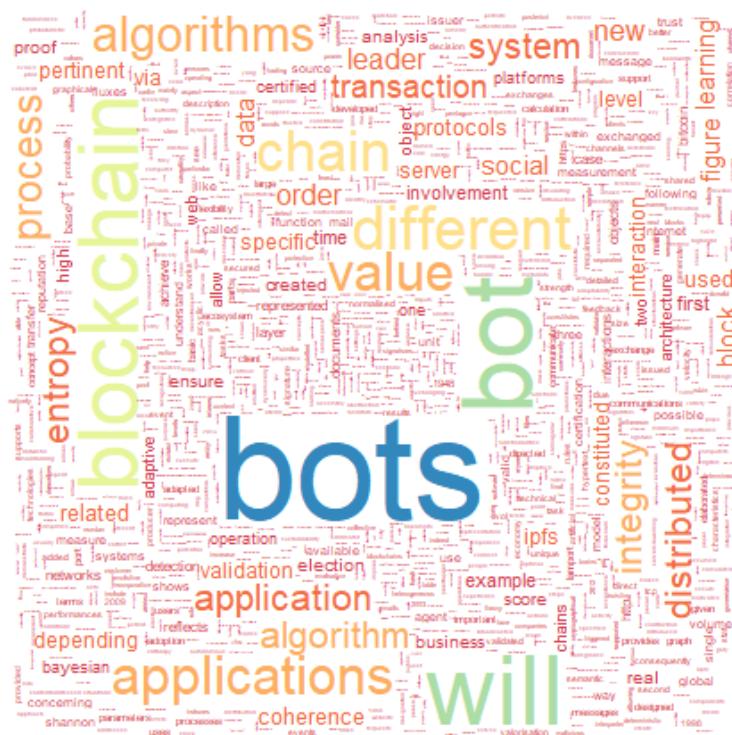




V.3.0

# NEUROCHAIN WHITE PAPER



# BUSINESS ORIENTED

## GENERAL WARNING

This draft White Paper is for discussion and pre-information purposes only. The information contained herein is subject to change. No part of this White Paper is legally binding or enforceable, nor is it meant to be, until it has been discussed, reviewed and revised by the board of directors, the board of advisors and Company lawyers. Please do not copy or disseminate any part of this White Paper without including this disclaimer. The final version of this White Paper will be published as soon as adopted.

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BY PURCHASING NCC TOKENS, YOU EXPRESSLY ACKNOWLEDGE AND ASSUME THESE RISKS. Only people who are fully aware of these risks should participate in the ICO. Note also that the ICO excludes certain groups of people such as “U.S. Person” (within the meaning of “Regulation S” of the Securities Act 1933 under U.S. law).

## EXECUTIVE SUMMARY



# NeuroChain

Powered by Machine Learning



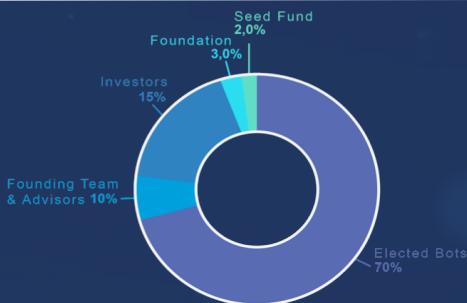
NeuroChain is an evolution of the Blockchain that integrates machine learning and AI to drastically improve the performance and capabilities of distributed systems. It's a distributed ecosystem specifically designed to carry collective AI applications.

**Distributed System  
+ New Consensus  
+ Machine Learning  
= NeuroChain**

### Key Figures

- #1 EU and French based Blockchain protocol
- 3 serial entrepreneurs
- 4 Doctors Ecole Polytechnique, MIT, Oxford, Columbia
- 6 nationalities
- 18 Team members, handpicked skills
- 330 years of experience in the team

### Token Allocation



The ICO will result in the immediate forging of 15% for token purchasers and 3% for the Founding Team and advisors. Post ICO all remaining tokens are forged to operate the NeuroChain : 70% for Elected bots, 3% for the Foundation, 2% for the Seed Fund and 7% for NeuroChain Management to be vested over 5 years to ensure a continuous involvement.

### Token Metrics

The **hardcap** for the NeuroChain project is **30M€**. This number is the estimated **budget for the delivery** of the first milestone : the NeuroChain Blockchain (V1). After this first delivery milestone, the project will be financed next with a set of planned release of the **reserve aligned with the project milestone delivery**. Token purchasers can decide to **exchange their tokens immediately** (private sales purchasers must respect their respective **lock up periods**) or hold them until the Business Applications developed by NeuroChain are built. At this time, their **value will have been boosted by the fantastic potential** of this disruptive protocol creating a huge ROI potential for purchasers.

### Executive Summary

- The circulating supply (post ICO)  
**NCC 395,000,000**
- The Total Supply Ever (100% of NCC)  
**NCC 4,374,000,000**
- The hardcap  
**EUR 30M**
- Token Public Price (March 19<sup>th</sup>, 2018)  
**EUR 0.08**

### ICO Structure



The total amount made available for the ICO purchasers is 15% of the total token allocation. It is split in two parts. 395,000,000 during the ICO and 262,000,000 called the Reserve progressively released to finance the project.

The reserve is locked and managed by the foundation to finance the remaining steps of the project :

1. Intelligent App based on Machine Learning – June 2019
2. Collective Artificial Intelligence – March 2020
3. Self-Consistent Blockchain and autonomous Bots – 2023

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## 2 INTRODUCTION TO NEUROCHAIN AND PHILOSOPHY OF THE PROJECT

### Artificial Intelligence: the next digital and productivity frontier!

As many business leaders and government officials are debating on the potential impact of Artificial Intelligence on their cost and profit structure, they actually may already be late to the party.

Forward thinking companies in financial services, high tech and telecommunication are re-thinking their business process to boost productivity. According to Accenture the growth of profits dropped from 25 percent in 2010 to -3% in 2015. On the other hand, there is a potential to boost profitability an average of 38% by 2035. This will lead to the creation of \$14T across 16 industries in 12 economies by 2035 (Source: The impact of AI on profits by industry - Accenture and Frontier Economics).

So, it is here, and it will create massive changes in our economies. No doubt. What most people see is the impact on their job. As productivity changes scale, millions of people need to be redeployed on additional and new added value activities. The need for re-training for both the workforce and our government and business leaders is certainly one of the first priority. In this early 2018, the initiatives to fully embrace this new digital frontier should be at the top of all leaders' agendas.

#### So what?

The classic People, Process and Technology is a rational way to address the topic.

As far as the Process is concerned, identifying how millions of tasks can be automated and how decisions can be made based on successful patterns is a first step that can lead to significant improvement. As an example, in the supply chain world, newly created platforms unify procurement, logistics, manufacturing, and inventory operations in real time and provide early warning of potential problems and propose alternative solutions; thanks to processes retooled with AI they analyze tens of millions incidents per day and US\$ trillion worth of products in real time.

The People aspect will be the north face for most businesses. According to Michael Chui from McKinsey Global Institute, half of our workforce activities can be automated. But on the other hand, the world will welcome millions of people coming from India, China, Indonesia, Africa and others. These populations are entering the consuming age with needs for a better efficiency energy mix and will create enough new jobs to offset the cut in traditional economies.

Then Technology. There is so much to say here. So, in a nutshell the first vital technology need is a new automation protocol that fully leverages artificial intelligence and allows businesses and individuals to fully develop their potential. The blockchain was the first step since it provided a decentralized ledger to transfer and store information safely. But the reality is that it is still a heavy process to approve the blocks (transactions). The concentrations of approvers (miners) in a few countries/hands is a complete paradox to the original spirit of the Blockchain and the energy needed to power the server farms is just impossible to scale to the level needed to rethink entire economies.

#### What is coming next?

NeuroChain (the "Company") is the best answer available since it is a brand new protocol based on a new consensus that does not give the priority to the biggest computation capacity or the wealthiest approvers, but rather the best behaviors (entropy, enthalpy and integrity, see below, or in our blog for scientific whitepaper for further technical descriptions).

With NeuroChain intelligent bots can evolve thanks to machine learning and benefit from the collective improvement made by other providers in the system. This new protocol, an open source language, can be deployed safely and benefit from the collective intelligence created by the network of contributors.

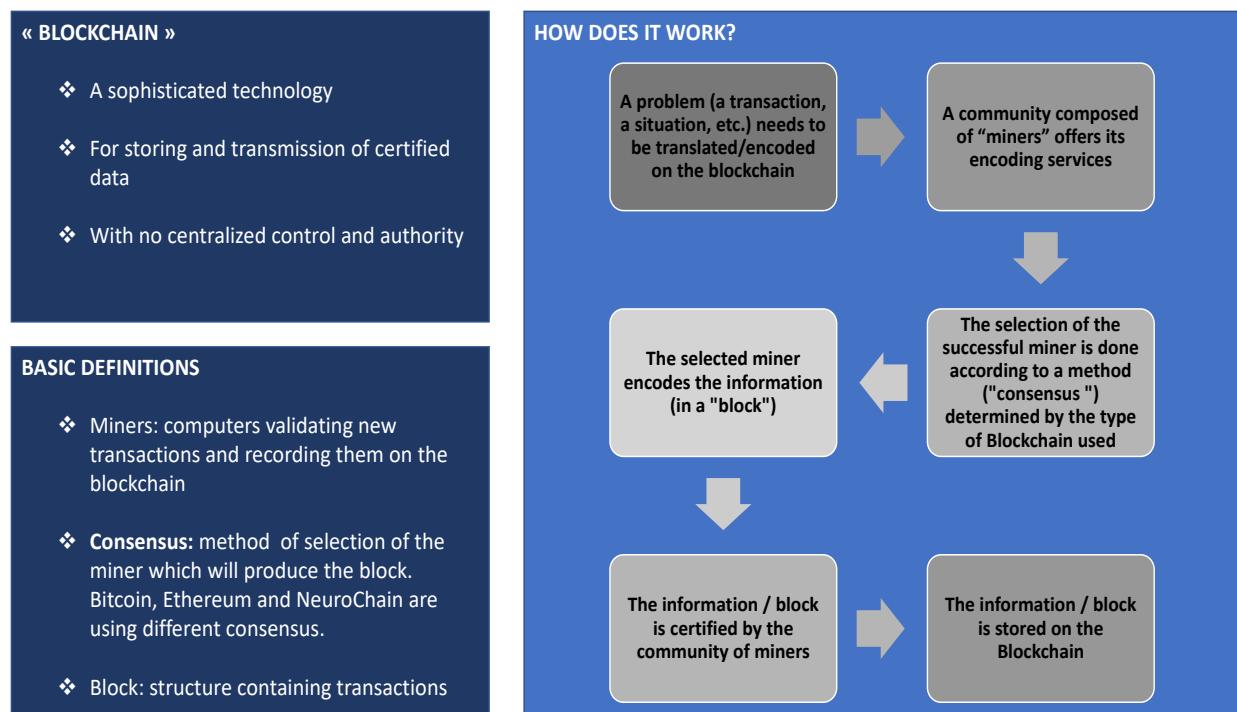
This is a very disruptive way to address technology since it is based on a rapidly evolving language that is accessible by all. Pioneers for sure will be the first to benefit from these new productivity boosts. Nobody can afford to be left behind.

NeuroChain will propose the protocol that will securely help to augment business processes with AI. Business leaders have the expertise in their field, with NeuroChain, they will also have the best strategy to stay ahead of the pack.

### 3 WHAT IS NEUROCHAIN ?

#### 3.1 BLOCKCHAIN BACKGROUND

##### The Blockchain in a few words



The Blockchain is a large-scale, innovative technology that allows digital data to be stored in a decentralized and secured manner.

Data and related transactions are ‘written’ in a ledger, pretty much like in a register. This ledger is decentralized, i.e. stored on the users' servers and not in a single location.

Constantly updated, transactions are tamper-proof since they are based on a user-controlled cryptographic validation system. The transactions, materialized by the lines in the register, are recorded in the general ledger after validation, by blocks of data, and thus form a chain of unalterable blocks: the Blockchain.

The Blockchain is therefore a decentralized registry in which everyone has the right to write, but no one can delete what has been written. This registry is available to everyone. It can be viewed at will but without being able to modify its contents once written. Having only one version of a physical register would be problematic (i.e. it would be impractical if everyone wanted the opportunity to write, but it would also be very risky if stolen or destroyed). To ensure the sustainability of this registry, many copies would have to be made. Unlike a good old paper registry, today's computers can share information quickly and ‘en masse’. The Blockchain register is computerized and copied in multiple places.

Unlike the current Internet network which operates on nodes owned by multinationals, with the Blockchain technology, which is based on a decentralized and peer-to-peer network, network users themselves become network nodes. Some of the users hold copies of the Blockchain worldwide. Thousands of the registry copies are constantly updated, simultaneously, making the Blockchain totally indestructible.

Some versions of the Blockchain, such as Ethereum or HyperLedger, even allow executing pieces of programs in the Blockchain, making decentralized execution possible.

### **Disruptive technology**

As of today, any transaction between two parties is somehow certified by a trusted third party (a notary, a bank, an insurance company, a government, etc.). The trusted third party ensures that the conditions are met to complete the transaction and then allows the execution (or even executes it) in accordance with the contracts signed and the legislation in force. At the very top of the chain of trust, the State is the guarantor of the coherence and stability of the entire system. It may grant or withdraw approvals to operators who do not comply with the rules.

This system, which has been in place for centuries, is in the process of being somewhat overturned by the Blockchain technology. Thanks to Blockchain, transactions between two parties will be carried out directly, via the Blockchain mechanism, without going through a certifying third party.

### **Applications**

Blockchain was born when the Bitcoin was created in 2009. The Bitcoin is certified "non duplicable", traceable and tamper-proof, all this guaranteed by technology. The exchanges and transfers of Bitcoins are visible to everyone, so it is impossible to create false Bitcoins without this being reflected in the decentralized registry. This technology also makes it possible to make payments without having to go through a bank or financial institution third party.

Bitcoin is a special application of the Blockchain, which is based on a monetary value: it is a cryptocurrency. The technology is used to ensure the traceability of transactions since each Bitcoin has its own encryption code. Thus, a user can only use a Bitcoin with a single recipient corresponding to a single given transaction.

As a result, the Bitcoin solved a first problem, the question of the permanence and uniqueness of digital assets.

But the Blockchain technology will have many other applications. In particular Blockchain will bring a new generation of business processes as detailed later in this document.

## 3.2 NEUROCHAIN AT-A-GLANCE

NeuroChain is an augmented Blockchain. NeuroChain brings AI at the heart of the Blockchain. So far, the blockchain technology has not really met its promises. This creates a significant barrier to entry. It has become urgent to overcome the current issues. NeuroChain offers a long-term solution which will make the blockchain technology open to the world.

NeuroChain is intelligent, more secure, more reliable and hundreds of times faster than existing Blockchains.

NeuroChain is an evolution of the Blockchain that integrates machine learning and Artificial Intelligence (AI) to drastically improve the performance and capabilities of distributed systems. It's a technological platform specifically designed to carry collective AI applications.

NeuroChain is the future of Blockchain. Its cutting-edge technology is based on years of extensive scientific research.

### Key concepts

It relies on 4 key concepts to go above and beyond the regular capabilities of Blockchain.

- It's powered by INTELLIGENT, ultra-fast, secure and reliable bots (robots)

The bots act independently and use machine learning algorithms to get better and better as time goes by.

- It's an ECOSYSTEM of collective artificial intelligence

The bots work seamlessly together thanks to a new protocol. The whole network of bots makes up the NeuroChain environment, an ecosystem of connected AI that gets more virtuous as it gets used.

- It performs better thanks to a clever DECISION protocol

Instead of relying like Blockchain on Proof of Work – that requires an enormous amount of brute computing power –, NeuroChain uses a PROOF OF INVOLVEMENT AND INTEGRITY (PII) protocol to achieve the best performance from a limited number of bots.

- It's an OPEN SOURCE initiative

NeuroChain is designed as a base on which to build intelligent applications. The power resides in the community that stands united under the banner of NeuroChain.

### NeuroChain's strengths

- Intelligent Applications: Forget smart contracts, which requires to lay down all the possible outcomes of a given scenario in advance. Think intelligent applications, where AI is now embedded into the contract. NeuroChain's architecture was designed to carry intelligent applications from the start. The scope of potential intelligent applications is endless.

- Reliability: NeuroChain favors quality over quantity, Intelligent bots over brute computer processing.

- Incredible Speed: Hundreds of times faster than the regular Blockchain.

- Security: NeuroChain doesn't rely on external validation (i.e. mining farms), the consensus comes from within the NeuroChain network.

## About the project

Based in Paris, France, the NeuroChain project gathers experts in their fields – Blockchain, distributed systems, machine learning, big data... – around a common goal: to make the world a better place by leveraging the power of NeuroChain. Two core members of the NeuroChain team wrote the first extensive French language book on Blockchain back in 2015. NeuroChain relies on cutting-edge innovations in consensus, communication, analysis, distributed abstraction and security. Moreover, NeuroChain is designed to be very flexible, allowing for a swift implementation of technological innovations. A NeuroChain prototype is already up and running on GitHub.

## 4 KEY FIGURES

NeuroChain is the **1**st EU and French based Blockchain protocol project

The **2** co-founders are blockchain pioneers

NeuroChain team includes **3** serial entrepreneurs

There are **4** Doctors in the team

**5** Team members have graduated in the best engineering schools in the world:  
*Ecole Polytechnique, MIT, Oxford & Columbia*

**6** nationalities are represented in the team

Altogether, there are **18** team members, with handpicked skills

Last, but not least, there is a combined **330** years of professional experience in the team

## 5 THE DIFFERENTIATORS

### 5.1 NEUROCHAIN PROTOCOL PROMISES

Existing blockchains execute anticipated programs (i.e. smart contracts). The existing protocols do not handle not pre-planned and not pre-programmed circumstances.

Machine learning capabilities are embedded into NeuroChain: its protocol allows execution of any transaction, planned or unplanned, pre-programmed or not pre-programmed.

Existing blockchains are based on two protocols: Proof of Work & Proof of Stake.

The Proof of Work protocol takes into account the computational power to select a miner who validates a transaction. This has led to a race for computational power and the creation of farms of servers for mining to get the cash rewards involved. As a result, the most powerful miner is the winner.

The Proof of Stake takes into account the miner's wealth in the network. The more a miner owns, the more it is selected to validate transactions.

NeuroChain's protocol is called Proof of Involvement and Integrity (PII).

Bots vs. Miners: given the limitations of miners, NeuroChain replaces them with Bots.

Bots are rewarded for their involvement in the network and their intrinsic integrity. Involvement and Integrity, rather than power and wealth.

This is made possible thanks to new machine learning capabilities embedded into Bots.

#### NeuroChain Scoring

For NeuroChain purposes, a business is a bot: when adopting NeuroChain, a particular business will be represented in the blockchain ecosystem by its Bot.

In NeuroChain, Bots are rewarded for their involvement in the network and their intrinsic integrity: Involvement and Integrity.

- Involvement is based on physics theories: Entropy and Enthalpy.

Entropy is the ability of a Bot to interact with other Bots: effectively sharing information means good entropy.

Enthalpy relates to the quality of the interaction with other Bots: sharing critical information means good enthalpy.

Each Bot will have an Entropy and an Enthalpy score calculated by NeuroChain's algorithm. This is machine learning and artificial intelligence at work.

- Integrity is the recognition of interaction relevancy. Integrity is calculated on the probability of a bot interacting with all bots, including in the future. Integrity means trust. Each bot will have an Integrity score.

The more effective a Bot is in introducing value to the network, the higher the global score. The higher the global score, the more chances the bot will be recognized by its peers and will be selected for validating transactions.

### NeuroChain value proposition

NeuroChain offers a scoring mechanism of each of the bots, so that peers and players are permanently assessed based on balanced criteria:

- ⇒ BEST & MOST RELEVANT BOTS (i.e. BUSINESSES) ARE EMPOWERED AND REWARDED

NeuroChain protocol enables the automation of decisions based on the dynamic scoring. A bot with a 'bad' score may automatically be replaced by a 'better' bot for carrying out the exact same task:

- ⇒ OPTIMUM DECISION-MAKING AUTOMATION

Unlike current blockchain rigid smart contracts, NeuroChain contracts evolve and re-assess constantly the ecosystem and the players (bots): agility and machine learning

- ⇒ UNLIMITED EVOLUTIVITY AND SCALABILITY BASED ON ARTIFICIAL INTELLIGENCE

### The existing Blockchain broken promises... addressed by NeuroChain

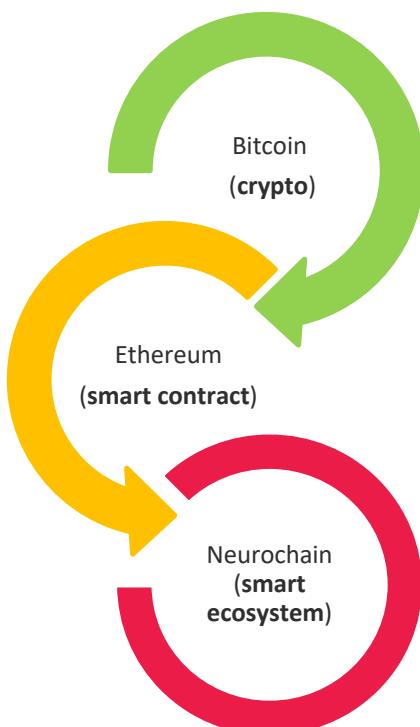
The Blockchain promise	Issues	NeuroChain
Trustworthy system	Approvers concentration	Innovative fair consensus
Transparency	Low adoption	Easy adoption due to business focused applications
Faster transactions	Block interval few minutes	Block interval ~3s
Reduced transaction costs	Iterative developments of smart contracts not scalable	Machine learning creates agility and auto adaptability

## 5.2 BENCHMARK WITH OTHER BLOCKCHAINS

Characteristics	Bitcoin	Ethereum	NeuroChain
Coins	Bitcoin	Ether	<b>Clausius</b>
Application properties	Financial Transactions	Smart Contracts	<b>Intelligent Applications</b>
Decision Making Process	Non-systematic	Non-systematic	<b>Constitutional Assembly</b> <b>Fair decisions</b>
Consensus Algorithm	Proof of Work	Current : Proof of Work Future : Proof of Stake	<b>Proof of Involvement and Integrity (PII)</b> <b>Weighted entropy and reputation scoring</b>
Transaction performance	7tx/sec	~25tx/sec	<b>Few thousand tx/sec (optimal)</b>
Block Interval	10 minutes	15 seconds	<b>~3 seconds (optimal)</b>
Block Size	1MB/Dyn	Dynamic	<b>Dynamic</b>
Technology	Distributed Network	Distributed Network	<b>Distributed Network + Machine Learning</b>
Applications	Cryptocurrency	Basic Smart Contracts	<b>Elaborated Applications: Crypto-Value, Traceability, Certified Data Bank, Social Interactions, Smart IoT, Business Applications</b>
Communication protocol	Static	Static	<b>Dynamic and adaptive</b>

See another comparison table next page.

BITCOIN: 1st blockchain generation	ETHEREUM: 2nd blockchain generation	NEUROCHAIN: the next blockchain
<b>CONSENSUS : Proof of Work</b> The selected miner is the most efficient The most efficient is the first one solving the problem Solving the problem 'just' requires computational power	<b>CONSENSUS : Proof of Stake (The most common alternative to proof of work)</b> The miner is randomly selected among all cryptocurrency holders. The probability is weighted by the total amount of cryptocurrency held (i.e. a miner who holds 10,000 tokens will have 10 more chances of being selected than a miner holding 1,000 tokens (1 token = 1 chance)	<b>CONSENSUS : Proof of involvement and integrity</b> <b>1) Miners are replaced by robots ("Bots")</b> Bots scoring according to interaction with their environment (active Bots vs. static miners) Involvement = quality of information provided Integrity = reliability of information provided <b>2) Selection of the Bot validating a block –</b> Random selection among highest rated bots
<b>Limited application</b> - Bitcoin is a blockchain limited to cryptocurrency (Bitcoins) exchange – no other business applications are available	<b>Applications:</b> Smart Contracts. They carry with them the benefits of the Blockchain technology and allow for automation... with limitations	<b>Bots interaction</b> – Businesses are represented by Bots; Bots will interact with each other thanks to Machine Learning and AI algorithms. Bots (hence businesses) will self adapt to the environment => Interactive and reliable network used for business applications
<b>Cons –</b> <ul style="list-style-type: none"> <li>Very large electricity consumption</li> <li>Concentration of the block production power to a limited number of miners – the most powerful</li> <li>No other business application development available</li> </ul>	<b>Pros –</b> <ul style="list-style-type: none"> <li><b>Security:</b> The smart contract is encrypted and distributed among nodes.</li> </ul> <b>Cons –</b> <ul style="list-style-type: none"> <li>Smart contracts' <b>Human factor:</b> People write the code, and can make mistakes, which are then embedded into the smart contract</li> <li>Smart contracts' <b>Implementation costs:</b> Smart contracts cannot be performed without programming, hence generating high cost</li> </ul>	<b>Pros –</b> <ul style="list-style-type: none"> <li>Consensus is smart, intelligent and ecologic</li> <li>Bots may be lodged in regular desktops, laptops or even smartphones</li> <li>Advanced business applications – adaptive technology</li> <li>The Bots scoring mechanism is a guarantee of the network and smart applications reliability</li> </ul> Adoption of the blockchain by businesses and the public at large is made possible



## 6 BUSINESS APPLICATIONS

### 6.1 INTELLIGENT APPLICATIONS VS. SMART CONTRACTS

The smart contracts were for the first time described in the nineties (1996) by Nick Szabo.

In the context of the Blockchain, a smart contract is an object in which a methodology is defined to execute, facilitate and verify the negotiation or improve the performance of a contract.

Smart contracts are pertinent since many contractual clauses may be partially or fully self-executed. The integrity of the contract is ensured by the Blockchain since all the transactions are listed in the immutable register.

However, the main limitation of smart contracts is their inability to handle complex clauses and take into account the evolution of their environment –they execute pre-planned conditions.

In NeuroChain, the intelligent applications are based on distributed rational agents (Bots). A rational agent always selects an action that optimizes an appropriate performance measure, depending on its knowledge. The performance measure is fully defined by the final user and reflects what the user expects from the rational agent.

To highlight the difference between intelligent applications of NeuroChain and existing standard smart contracts, a clear description of a rational Agent should be given:

#### Rational Agents (Bots)

A Bot is a rational agent taking into account its environment and having an autonomous behavior. To act rationally, an agent should take both the past and the future into account when making an action. The past refers to the information the agent knows and the actions it has made until time t. The future refers to the information the agent expects to receive and the actions it will make after time t (predictions).

For an optimal decision making, an agent has to map the complete history of observation-action of all the other agents in its ecosystem. Merely storing all observations would require very large memory and computational power, hence would be too expensive.

In a standard artificial intelligence environment, a goal for a particular task is a desired state of the considered environment. Accordingly, planning in the AI world refers to searching through the state space for an optimal path to the goal.

In a deterministic environment (smart contracts), planning comes down to a simple graph search problem.

In a stochastic world (intelligent applications), the agent takes into account the uncertainty of the transaction when planning.

As a conclusion, the main difference between smart contracts proposed by existing blockchains and intelligent application proposed by NeuroChain, is the planning world (decision making system). With existing blockchains, the world is deterministic while with NeuroChain, the world is stochastic.

With NeuroChain, the Bots are rational agents: they will comprehend their environment, including the behavior of other Bots, and will act rationally depending on the ecosystem and the “potential” actions of the other Bots.

This intelligent environment will allow to build smart business applications.

## NeuroChain: when Intelligent Blockchain Reinvents Business

NeuroChain is composed by a chain of Bots, which is an intelligent Blockchain where Machine Learning and Artificial Intelligence enrich the distributed system. The main characteristic which makes NeuroChain different is its capability to share the intelligence between the Bots.

The first intuitive application of NeuroChain is public which means Open Blockchain. But also, specific private applications called Smart Business Application such as the chains of traceability applied in various industries (agriculture, health, finance, accounting, human resources, etc.).

NeuroChain's entire design is focused on intelligent business applications, architecture, communication protocol, machine learning algorithms and connectivity with other Blockchain but also with other orphan (exogenous) bots that provide a fertile ecosystem for augmented business.

Another important aspect of NeuroChain is its flexibility to provide a distributed environment to connect autonomous agents and create a synergy between them. This property meets the needs of companies to achieve a high level of cooperation and collaboration between their various applications and therefore between their teams.

In other words, NeuroChain provides tools for transforming disparate intelligent agents into artificial (and human) collective intelligence.

Security, trust and exploration are the main properties included in the package offered by NeuroChain.

The NeuroChain new paradigm is to create a space or an environment that represents a source of intelligence. NeuroChain is designed to analyze the situation and make a decision.

The created Bot ecosystem allows different workflows (whose integrity is ensured by the protocol) between these Bots and also between Bots and humans. It thus induces trust and neutrality in the exchanges within and between companies.

Two examples:

**Traceability and transparency:** The distribution and persistence characteristics of NeuroChain allow the lineage of an object or concept between different actors in a given process. This induced traceability could apply to different fields of activity, agriculture, food, medicines, energy, compliance, and regulated professions. Machine Learning algorithms shared between the Bots allows also an audit of the transactions in order to detect anomalies or malicious exchanges. This process will allow the establishment of high level trust in the application.

**Documents storage and management:** the redundancy of validations in the network will achieve a high level of trust and certification. The use of NeuroChain protocol will provide a cryptographic signature of the documents. Stamps of documents will be saved in the Blockchain to ensure the uniqueness and durability of digital signatures. This repository of documents will be used for different applications such as traceability.

The list of applications is endless. The two examples above give an overview of NeuroChain capabilities. A number of companies have been targeted already, and all of them are very keen to move forward quite quickly in creating customized applications (Energy, taxes calculation and collection, industry, IoT, etc.). Some companies have even asked for consulting type of services to the NeuroChain team (please see the web site for the name of 'partners').

### ⇒ NeuroChain : Better business decisions

## 7 ICO STRATEGY – TERMS AND POLICIES OF ICO

The next few pages describe the creation of NeuroChain Blockchain and its attached crypto-currency:

- Executive Summary
- Details on the crypto-currency issued
- ICO economics

Any update on this part of the project will be posted on the Company website, in particular the Terms and Policies, which shall be amended or supplemented at any time at the sole discretion of NeuroChain: <https://www.neurochaintech.io/>

The document describes forward looking elements that are subject to risks and uncertainties that could cause actual results to differ materially from our projections.

This document is not an offer and is for information purpose only. The information contained herein is subject to change. No part of this draft document is legally binding or enforceable. Accepted purchasers of the token will receive legal documents in due course. NeuroChain is compliant with existing regulations. Therefore, all token purchasers without any exception, will have to provide the required data as specified in the KYC form they will receive (Know Your Customer). Before signing the Token Sale Agreement with NeuroChain, specific attention will have to be paid by each purchaser to the legal warnings which will be displayed in due course on our web site and ICO related documentation, since some participants may be banned and will not be allowed to take part to the ICO. This will be detailed extensively and NeuroChain will strictly enforce its KYC policy.

The NeuroChain ICO is a Pre-Sale since NeuroChain is a new Blockchain protocol and the crypto-value created will be forged later in the NeuroChain ecosystem.

NeuroChain's blockchain development is in progress. A demonstrator already exists.

The first NeuroChain elements to be delivered will be:

- The NeuroChain infrastructure (Blockchain Protocol)
- The Artificial Intelligence that will act as a part of the validation process
- The client software
- The Meta language based on C++ agent oriented (the Neuronal)
- The SDK (development kit for intelligent apps)
- The interface apps
- The tooling for web apps
- The fast deployment tools with automatic controls and online repositories
- The documentation to use it all.

Beyond these technical points, a wiki and training center will be created.

Easy to use interfaces for simple apps will be created, and a large marketing and evangelization process toward corporations to get quick wins on technical issues will be started as soon as possible.

The objective is to leverage on actual use cases, ensure real integration of production grade applications.

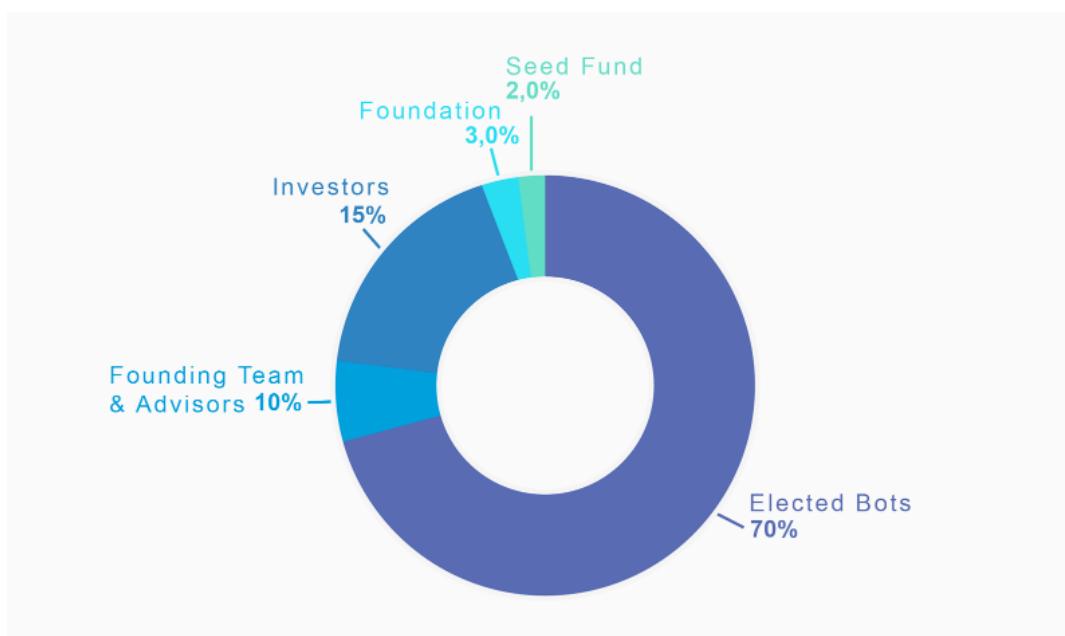
## 7.1 ICO EXECUTIVE SUMMARY

NeuroChain will create a **crypto-currency**.

The NeuroChain's crypto-currency will be called CLAUSIUS, or "NCC" (for NeuroChain Clausius).

The total supply ever will be **NNC 4,374,000,000**

The total forged NCCs will be distributed as follows:



### A- 70% will be distributed to NeuroChain elected Bots (forging block reward, "neurogenesis")

- Validate transactions and Block analysis reward.
- Support stable / viable network
- Processing intelligent applications

### B- 15% will be granted to Token purchasers (Genesis allocation)

- People who wish to support the NeuroChain project from the outset will be able to buy NCCs in exchange for other crypto-currencies (Bitcoin, Ethereum) or Euros;
- The crypto-currencies or Euros they give in exchange for NCCs will help develop and support the project & business development; it will also help develop partnerships with various industries and top-level universities (La Sorbonne, MIT, ...); and it will allow to start a marketing and communication campaign.

### C- 10% to be granted to founding team & key advisors (Genesis allocation and 5 years linear vesting)

Two thirds of these NCCs will be generated through a vesting process linearly spread over 5 years to ensure the full success of the project.

- The main missions of the group are:
- Design of the NeuroChain blockchain
- Technical research, engineering, deployment
- Security and communication protocol
- Maintain / improve the protocol

- Long-term strategy and business development
- Legal and financial strategy
- Marketing and communication

**D- 3% to be granted to NeuroChain Foundation (Genesis allocation, 5 years linear attribution or vesting)**

- Insure long term governance / meetings
- Public works
- Training and education
- Community building
- Legal and compliance

If the NeuroChain Foundation is not created, the 3% NCCs will never be forged.

**E- 2% to be granted to seed capital and innovative applications (Genesis allocation, 5 years linear vesting)**

- Developing promising applications on top of the NeuroChain
- Build partnerships and continuous improvement mechanism for the protocol
- Branching with other Blockchains

**Critical points of attention in relation to the NCCs distribution**

The allocation detailed above offers a long-term visibility of the created volume and potential value of the NCC.

The long term vesting process for the founding team and advisors is critical to keep their energy and creativity focused on the success of the project.

Altogether, the NCC distribution is a powerful tool to control speculation and volatility of the NCC by injecting regularity in the process.

The founding team and advisors will not hold more than 10% of all the NCCs ever created.

The largest part of NCCs (70%) is granted to the Bots.

## 7.2 NCCs FEATURES

The Tokens are utility tokens that will, once the Platform is developed, be used exclusively on the Platform.

In particular, purchaser of NCC will have the right to:

- use the artificial intelligence and machine learning capabilities of the created blockchain platform;
- create intelligent applications; and
- become Bots providing artificial intelligent and machine learning services in the NeuroChain network and therefore elected Bots during the election process, hence potentially earning Clausius ("NCC") as a contribution for their election.

The various uses and utilities of the Token will be further described on NeuroChain website at <https://www.neurochaitech.io/>.

The Ownership of Tokens carries no rights, uses or attributes, express or implied, other than those described in these terms and in the Whitepaper.

In particular, you understand and accept that Tokens:

- a) do not represent or confer any financial right on the economic results of the Company ;
- b) do not represent or confer any ownership right or stake, share or security or equivalent rights, intellectual property rights or any other form of participation in or relating to the Platform and/or Company and its corporate affiliates ; and
- is not intended to be a digital currency, security, commodity or any other kind of financial instrument.

### 7.3 ICO ECONOMICS

The ICO is designed to allow participants who believe in the project to take part in it at the outset.

There will be two stages, subsequently:

- A Private sale
- A Public sale, in three steps:
  - o Discount sale phase
  - o Attractive sale phase
  - o Haste sale phase

The accepted cryptocurrencies are the following :

- Bitcoin (will depends on statistics and compromise between security and utility)
- Ether (confirmed)

Euros will be accepted as well.

The crypto-currency is called NeuroChain Clausius. Its tag is **NCC**.



#### The Private Sale (Feb 19th – Mar 12th, 2018)

The Private sale of NeuroChain has two main objectives:

- Incentive the early adopters (or believers)
- Show to the community a quantitative measure of early success.

To be accepted in the private sale, purchasers of tokens must:

- Provide the KYC form (Know Your Customer);
- Sign the confidentiality clause along with the KYC

- Attach a scan of ID (Passport or driving license or ID)
- Plan a skype interview with the NeuroChain executive team to finalize the conditions.

NeuroChain team will make a decision on whether accepting the purchaser to the Private Sale.

Afterwards, an Agreement will be provided to be signed by each accepted purchaser. At this time only, the purchase will be possible.

### Philosophy of the Private Sale

Regarding our project and strategy (communication and ICO), the community is an important factor to the success of NeuroChain. For these reasons, the private sale is proposed to the community with conditions and limits.

### Lock up period

To ensure the stability of NCC and therefore the stability of NeuroChain, a lock up mechanism will be set up for the private purchasers. The lock up process is as follows:

- 30% of NCCs will be available after the ICO
- 30% of NCCs 3 months after the ICO
- 40% of NCCs 9 months after the ICO

The steps of the lock up period are correlated with the progress of the NeuroChain project to ensure its stability.

## **The Public Sale – Terms and Conditions**

### Step 1: The discount phase

The first step of the sale is characterized by the fact that there is a decreasing discount over a period of one week maximum.

<b>Starting date</b>	March 19th, 2018, 00:00:00 UTC (Equinox Spring)
<b>Ending date</b>	March 25th, 2018, 23:59:59 UTC
<b>Maximum total expected</b>	~10 million EUR equivalent in BTC or ETH
<b>Minimum entry floor</b>	Median expected funds computed from white list commitment(1)
<b>Maximum entry cap</b>	Average expected funds computed from white list commitment + 3 standard deviation(2) (to satisfy maximum people)
<b>Unit price</b>	0.08 EUR equivalent in BTC or ETH, increasing over time(3)
<b>Max token distributed</b>	200,000,000 NCC
<b>Conditions</b>	White List and KYC

The pricing function is as follows:

$$Purchase\ Value_t = B * \exp^{discount\ rate * \max(\frac{\tau}{T}, \frac{f}{F\_discount\_phase})}$$

Where:

B is the base price: 0.08 EUR

M is the max price: 0.10 EUR

$\tau$  is the marginal time spanned from phase start to phase end

T is the total time spanning over the phase

f is the funds invested so far

$F\_discount\_phase$  is the max amount of money expected during this phase: 10 million EUR.

The equation that will allow to compute, by using limit conditions, the decreasing discount rate is as follows:

$$\text{Discount rate} = \ln\left(\frac{\text{Purchase Value}_t}{B}\right)$$

When the threshold of the allocated volume of NCCs sold is reached or at the end of the week, whichever comes first, the sale is temporary closed. Any purchaser that would apply for the first step of the sale while it is closed, will have a priority for the second step of the sale.

### Step 2: The attractive phase

The second step of the sale is characterized by the fact that the selling price of the NCC will be constant. The amount of NCCs that could be purchased will be of 30,000,000 maximum over a two weeks period.

Participants that would have applied for the first step of the sale while it is closed, will be toggled to Step 2 automatically.

Step 2 will be over when the number of NCCs exchanged reaches 30,000,000 or at the end of the two weeks period, whichever comes first.

During this phase, all funds are accepted, and a peg is established during two weeks.

<b>Starting date</b>	March 26th, 2018, 00:00:00 UTC
<b>Ending date</b>	April 8th, 2018, 23:59:59 UTC
<b>Maximum total expected</b>	3 million EUR equivalent in BTC or ETH
<b>Minimum entry floor</b>	0.1 ETH or its equivalent in BTC.
<b>Maximum entry cap</b>	2000 ETH
<b>Unit price</b>	0.1 EUR equivalent in BTC or ETH, constant price
<b>Max token distributed</b>	30,000,000 NCC
<b>Conditions</b>	KYC

### Step 3: The haste phase

During the third step, over a one-week period of time, the selling price of the NCC will progressively go up, for a maximum of 20,000,000 NCCs sold. The more purchasers will want to benefit from the sale, the higher the exchange value.

<b>Starting date</b>	April 9th, 2018, 00:00:00 UTC
<b>Ending date</b>	April 15th, 2018, 23:59:59 UTC
<b>Maximum total expected</b>	Up to EUR 3 Million
<b>Minimum entry floor</b>	0.5 ETH or its equivalent in BTC.
<b>Maximum entry cap</b>	2000 ETH or its equivalent in BTC.
<b>Unit price</b>	EUR 0.10 up to EUR 0.20
<b>Max token distributed</b>	20,000,000 NCC
<b>Conditions</b>	KYC

The maximum total expected at this phase is unknown. The peg on the price is not maintained at 0.10 EUR equivalent for 1 NCC. The price will increase and will be computed based on demand. The upper limit of the price is 0.20 EUR. The idea behind the mechanism is that the critical amount necessary to start and trigger the project is reached. The price increases to dissuade people purchasing, but as said randomization is important for the protocol. The unsold tokens will be locked.

The duration of this period could be adapted according to the ICO progress. If the objective of the attractive phase is reached, the hast phase will be shortened.

The model is similar to the discount phase, but for:

- the limit conditions and
- the valorization rate.

The equation transforms into:

$$Purchase\ Value_{\tau} = B\_haste\_phase * \exp^{discount\ rate * \max(\frac{\tau}{T}, \frac{f}{F\_haste\_phase})}$$

Where:

B\_haste\_phase is the base price: 0.1 EUR

$\tau$  is the marginal time spanned from phase start to phase end

T is the total time spanning over the phase

f is the funds invested so far in the phase

F\_haste\_phase is the max amount of money expected during this phase: around 3 million EUR.

The equation that will allow to compute, by using limit conditions, the decreasing discount rate is as follows:

$$Discount\ rate = \ln\left(\frac{Purchase\ Value_{\tau}}{B\_haste\_phase}\right)$$

We believe that a fair valuation mechanism is much sounder than hectic speculation. Therefore, the mechanism allows keeping a relatively stable value during the haste phase.

## Project Cap

The NeuroChain project is based on a strong business plan, built and audited with experts in finance and blockchain to capture the correlations and ensure the coherence between the different steps of the project and the financial part. The projections are on 5 years with high granularity during the first 18 months.

The adequacy between the technical part and the financial part of NeuroChain project allowed to identify the different steps and deliverables in time and according to the funds raised.

Formally, the hard cap is the addition of the expected raised amounts during the private and public sales → EUR 30 M equivalent in BTC or ETH. The hast phase is designed to dissuade the purchasers given the increase in token price (x2). The circulating supply after the ICO will correspond to the volume of sold tokens.

The unsold tokens, if any, and the reserve will be locked. They will progressively be made available over time to finance the following steps of the project according to the roadmap: after a new version of the blockchain is delivered, the total token reserve will be made available to finance the next version (See below for details on the timing). No other event shall generate unlocking of the reserve. In particular, the founding team will not be granted these tokens.

The community will be in a position to clearly follow up on these critical points.

## 8 ROADMAP

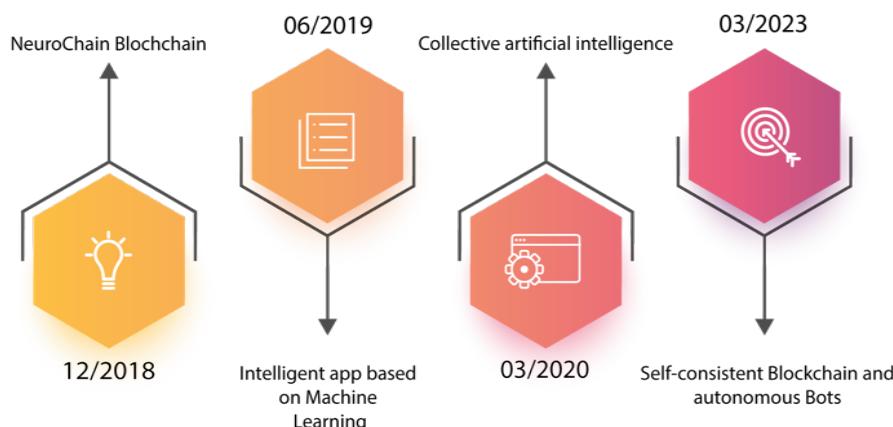
### 5 years Development roadmap:

**V1:** The new Blockchain infrastructure based on Proof of involvement and integrity. The time estimation is about 9 months after the ICO consolidation.

**V2:** Integration of Proof of Workflow allowing intelligent applications based on Machine Learning. This functionality is expected 15 months after the ICO consolidation.

**V3:** The third phase, 2 years after the ICO consolidation, is the integration of intelligence sharing property by the Bots and instauration of collective artificial intelligence.

**V4:** Five years after the ICO consolidation, self-consistent distributed system will be achieved where the Bots experience a form of autonomous.



5 years development roadmap

## GLOBAL ROADMAP



## 9 FINANCIAL HIGHLIGHTS

The NeuroChain project is based on detailed planning, to capture the correlations between the scientific expertise and the business reality of a new start-up.

The 3 years financial projections show the consistency between the technical part and the financial constraints of the project.

### Business Plan



<i>Amounts in M EUR</i>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>3 years</b>
<b>Revenue</b>	<b>30,0</b>	<b>0,0</b>	<b>0,0</b>	<b>30,0</b>
<b>Compensation</b>	<b>(2,7)</b>	<b>(7,3)</b>	<b>(10,6)</b>	<b>(20,6)</b>
<b>G&amp;A</b>	<b>(1,6)</b>	<b>(3,1)</b>	<b>(4,4)</b>	<b>(9,1)</b>
<b>EBIT</b>	<b>25,7</b>	<b>(10,4)</b>	<b>(15,1)</b>	<b>0,3</b>
<b>Headcount (avg)</b>	<b>41,1</b>	<b>111,5</b>	<b>159,8</b>	

Assumptions : ICO hardcap at EUR 30 M raised in Q1 2018, no additional fund raising until NeuroChain V3 is delivered

## Costs Breakdown



<i>Amounts in M EUR</i>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>3 years</b>
Technical	1,6	5,1	8,3	15,0
Marketing	0,3	0,7	0,8	1,8
Partnership	0,2	0,4	0,4	0,9
Legal & Quality	0,2	0,3	0,3	0,9
Administrative	0,3	0,6	0,7	1,5
General Management	0,1	0,2	0,2	0,4
<b>Compensation</b>	<b>2,7</b>	<b>7,3</b>	<b>10,6</b>	<b>20,6</b>
IT	0,1	0,7	1,3	2,1
Premises	0,3	0,9	1,3	2,5
Other G&A	1,2	1,5	1,9	4,6
<b>G&amp;A</b>	<b>1,6</b>	<b>3,1</b>	<b>4,4</b>	<b>9,1</b>
<b>Total Cost</b>	<b>4,3</b>	<b>10,4</b>	<b>15,1</b>	<b>29,7</b>

## 9.1 USE OF THE PROCEEDS: RESEARCH STRATEGY

NeuroChain is an intelligent Blockchain with many innovations in different fields: consensus, communication, analysis, distributed abstraction and security.

Because technologies are in fast and perpetual evolution, technological watch is taken into account earlier in the project, parallel to its development and industrialization.

Most of the funds collected will be used in R&D.

Four main axes of research are identified:

### **Consensus and Blockchain Performances**

In distributed systems, the consensus is central in the decision process in order to converge to a specific state of Blockchain. In this regard, consensus may be considered as a state function which is fully determined. In NeuroChain, the consensus is based on another state function which is the entropy weighted by the enthalpy and integrity. This measure is fully adapted to distributed systems and therefore determines the most pertinent Bot (depending on the paradigm) to enrich the resilient data base and create wealth.

The consensus in Blockchain, in particular in NeuroChain has to be continuously improved to adapt it and its parameters for performant operations in the network. NeuroChain is constructed to support these improvements through adaptive parameters similar to machine learning methodology.

This research focus is a priority for NeuroChain. In this context, collaborations with leading universities in the world, in algorithmic and distributed systems, are initiated and will be enhanced over the coming months.

Proof of Workflow developed for distributed algorithms and based on IPFS protocol will be improved rapidly by involving the Bots for the distributed storage of the algorithms keeping a high level of security. The idea is to dissociate NeuroChain from IPFS to guarantee a complete and auto-consistent ecosystem.

### **Security, Cryptography and Anomaly Detection**

Security in distributed networks represents a constitutive pillar since any regulation entity in the system is banned. Cryptographic techniques are therefore used to introduce high level of security and trust in the system. In NeuroChain Machine Learning Algorithms are also at work to detect malicious transactions and behaviors in the network. The first proposed algorithm is based on Bayesian network to estimate the probabilities in order to detect incoherent or improbable events.

These two complementary processes, the first, a priori and the second, a posteriori, represent an active field of research in many disciplines. At NeuroChain, also, cryptography and Machine Learning algorithms are identified as critical, and a dedicated team is constituted with this aim, early in the project.

### **Communication Protocols and Technologies**

Secure and adaptive direct communication between the Bots in NeuroChain is important to achieve high level of availability and resilience. In NeuroChain, several communication protocols are available in order to ensure maximum security and portability. The evolution of the protocol is critical to keep the performances at the highest level. This is also a research priority for NeuroChain.

New promising communication technologies will also integrate into the project. We will be testing them through proof of concepts.

## Architecture

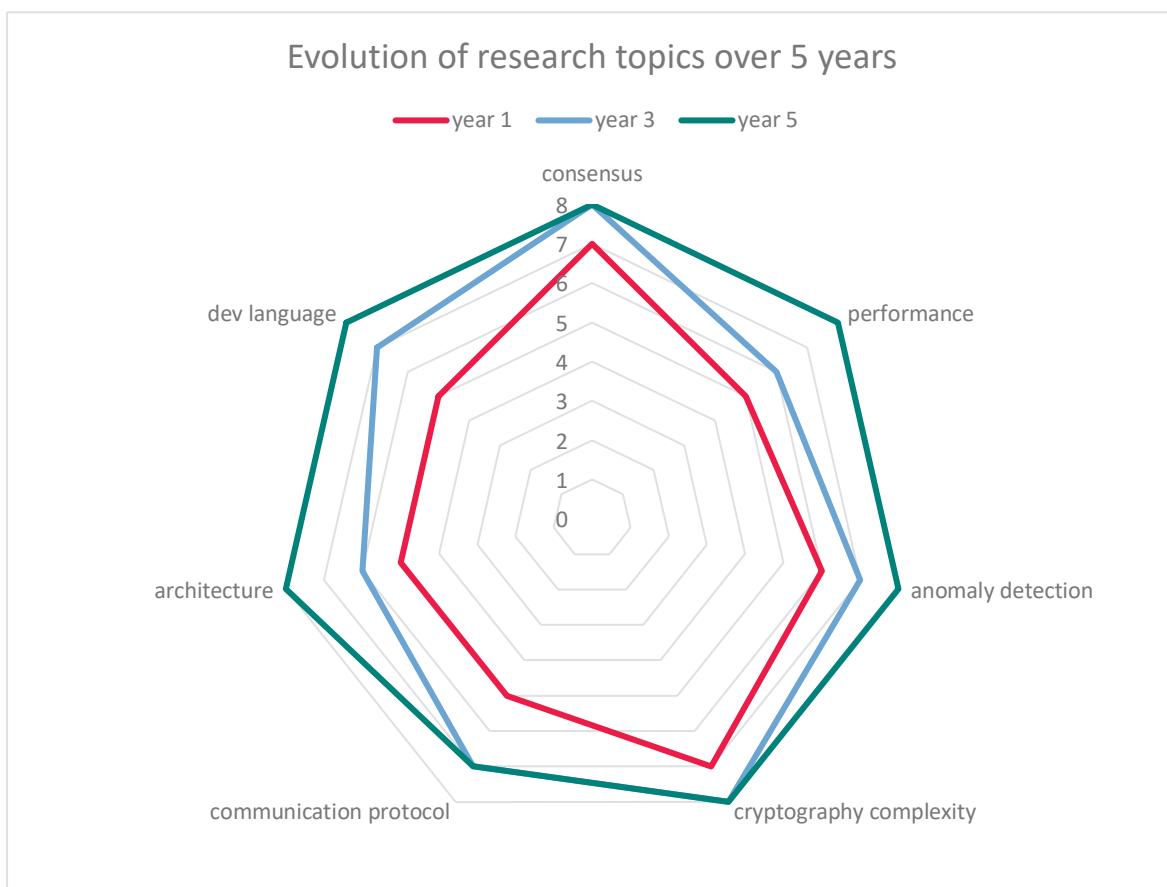
By design, through distributed Bots, NeuroChain is totally polymorphous. It can meet current and future needs by adapting to Kappa, Lambda, Data Driven and even Event Driven architectures.

NeuroChain architecture presents also a large flexibility and capability of partitioning treatment and connectivity with existing applications. The ultimate goal is to bring a new vision of architecture by decorrelation of the application layer from the physical layer. The applications will become totally fluid and dynamic without adherence to the hardware. Like ideas spreading from one human mind to another through collaboration, applications will adapt from one technical environment to another.

- ⇒ **In other words, NeuroChain is inspired by the most advanced and efficient engine: the brain**

The following diagram represents the research projections for the coming five years, potentially less than that depending on funds collected.

## 9.2 EVOLUTION OF RESEARCH TOPICS OVER 5 YEARS



## 10 TEAM

### 10.1 FOUNDERS



*Frédéric Goujon*  
**CEO**

Big Data Architect, Frédéric is an entrepreneur in Business Intelligence and author on blockchain.

- . More than 20 years of experience in distributed and high availability application architectures.
- . Data specialist, he knows everything about traditional databases as well as Big Data databases.
- . Passionate about innovation, change and technology, digitization is Frederic's Leitmotiv.
- . He has started several technology companies, and sold a couple. Successful entrepreneur, he has been leading companies and teams for more than 15 years.
- . Author of a book on the Blockchain with Billal Chouli (Les Blockchains - De la théorie à la pratique, de l'idée à l'implémentation – Editions ENI, 11 janvier 2017).



*Dr. Billal Chouli*  
**CTO**

Doctor in nuclear physics, Billal is specialist in distributed Algorithms, Cryptography and Machine Learning.

. PhD in nuclear and particle physics from the Commissariat à l'Energie Atomique (CEA) and the Massachusetts Institute of Technology (MIT), and with the Joint European Torus (JET) in Oxford.

. Highly skilled in Modeling (R, Matlab, C++ and C#), Probability and Applied Statistics, Stochastic Mathematics (Simulation of systems and analysis of their behavior) and Machine Learning.

. In charge of a R&D team (PhDs and engineers) in Machine Learning and quantitative finance, to carry out fundamental research and achieve innovation projects based on Statistical Learning (advice, Big Data architecture and algorithm deployment).

. Author of a book on Blockchain technology with Frédéric Goujon.

## 10.2 FOUNDING TEAM



*Bruno Delahaye*  
**CMO - Founding  
Partner**

Software industry veteran and Digital Marketing leader, Bruno is an Industry Transformation recognized expert.



*Rogier Van Der Wal*  
**Sales Advisor**

Director of Sales and Marketing at Interxion France (data center specialist). Business leadership & determination are the keys of Rogier's success.



*Dr. Patrice Guichard*  
**Security Advisor**

CEO, IT Security Expert and Legal expert at the Paris court of Appeal. Patrice is passionate by cryptography and new technologies.

## 10.3 CORE TEAM



*Dr. Maxim Irshkin*  
**Scientific Manager**

Project Manager at Nuclear Cluster at Skolkovo Foundation, Maxim has defended his PhD in nuclear physics at CEA (France).



*Maurizio Cacace*  
*Technical Specialist*

Design Engineer Presso at Hyundai Motorsport GmbH. Maurizio is passionate about new technologies and blockchain.



*Dr. Talib Dbouk*  
*Technical Specialist*

Associate professor at IMT Lille (France), Talib is a specialist in fluid mechanics and topology optimization. He is also passionate by blockchain technology.



*Nicolas Van Eeckhout*  
*Agnostic & Holistic Innovation Catalyst*

More than 15 years experience in Innovation. Nicolas has developed his technical skills as well as entrepreneurial skills, while deploying a great versatility and creativity in goals achievement.



*Benjamin Mateo*  
*Blockchain Architect*

Benjamin is an IT engineer with a lot of experience in computer science for various industries. He has founded several startups and worked as an IT specialist for major companies and institutions.



*Dr. Luca Comisso*  
*Research Fellow, Columbia University*

Research Fellow at Columbia University in the City of New York, Luca is a specialist in computational particle and plasma physics.



*Jérémie Seban*  
*Blockchain Project Architect*

Managing partner of FranceChain Solutions: development and advice in blockchains. Project management of ICO, development of smart-contract, integration of means of payment in cryptocurrency.



*Yves-Michel Leporcher*  
*Lead Dev*

Big Data lead Dev / Data scientist. MSc. in Quantitative Finance, and author on blockchain and finance.



*Gilles Slomovits*  
*Data Scientist*

Senior consultant IBM Cognos analytics TM1. Conception and construction of prototypes. Gilles is expert in his field.

#### 10.4 ADVISORS



*Dr. John Rice*  
*Scientific advisor*

Dr. of plasma physics at Massachusetts Institute of Technology (MIT).



*Pascal Lauffer*  
*Scientific Advisor*

Pascal is an entrepreneur and Technology enthusiast. CEO FIMAT – Blockchain Financing.



*Renaud Roquebert*  
*Founders Advisor – Blockchain Legal & Tax – Global Strategy*

Founder & Managing Partner at LightHouse LHLF, a Law Firm based in Paris, France, Renaud is an entrepreneur lawyer who has advised tech start-ups for more than 23 years.



*Hubert de Vauplane - Kramer Levin*  
*ICO Legal Advisor*

## 11 LONG TERM VISION

### NeuroChain WILL change the world

Blockchains are bringing us to a massive turning point, but in their present form, they will not be able to completely make the transition.

Things have accelerated considerably in recent years, wealth has been created faster than ever, technology is embedded in our lives, and technology changes are somehow frightening.

It may only be the beginning.

We dream of moving from a compartmentalized world to a world of trust and exchange – implementing decentralized applications without a single point of control and consequently without having to question the legitimacy of the operators. Security provided by cryptographic mechanisms and peer to peer dissemination of information is a fanstatic way to do it.

The Blockchain would be the link between the world of business and that of consumers. Exchange becomes possible by opening bridges between mainstream applications and closed corporate worlds.

But the existing Blockchains may not be ready to take on this responsibility. They fulfill their task in cryptocurrency exchange, and on executing smart contracts, but this is not enough. They lack intelligence. At NeuroChain, we bring machine learning and artificial intelligence to the blockchain.

Blockchains are composed of 3 main elements: peer to peer exchanges, cryptography technology and a consensus algorithm. The magic side of Blockchains lies in one word: decentralization – no central server, no control point.

The differences characterizing blockchains often lie in their consensus algorithm. The precursor, Bitcoin, uses the Proof of Work, which uses the power of machines to determine who can write the next block. This has generated a frantic race to machine power, because whoever gains the right to write the next block will receive money. Others use the Proof of Stake, which will choose a random token from all existing tokens. In this world, the richests, those with the most tokens, are more likely to win.

It is hardly possible to have a fair and impartial system with the existing consensus.

How to do it then? At NeuroChain, we decided to put everything back to square one, starting from a empty page, and we have given a lot of thought to it. In our consensus algorithm, the Proof of Involvement and Integrity, we take into account the quality of the data entered in the Blockchain. We have created a formula based on entropy, enthalpy and integrity.

It's more ethical, it's fairer, it's quicker, it's more efficient. It's the blockchain made intelligent. No more brute computationnal power, no more 'wealth comes first'.

If you have convictions, it's time to take part and be active. If you want to change things, speed up the movement, contribute to creating something incredible, now is time to seize the opportunity. Like many, we are "blockchain enthusiasts". We are fans of this movement, but to our regret, the values underlying the creation of these technologies have fallen into oblivion.

We at NeuroChain have the opportunity to change this. This is going to be the Blockchain momemtum, our collective momemtum.

Let's not miss this opportunity !

We want to make sure that our lives will not remain in the hands of the giants of the Internet or governments. We want to bring more justice and fairness in the technology world. As specialists of machine learning and artificial intelligence, we will bring the thinking ability to the Blockchain. The Blockchain is beginning to deliver its promises. Things happen, despite the reluctance of skeptics. This is just the beginning.

We want to go several steps further. We want to bring collective intelligence into the system.

Intelligence is one of the most complex concepts to define. In the context of NeuroChain, there is a relevant definition of intelligence, which was in fact given in the fifteenth century, during the Italian Renaissance: "Intelligence is none other than the reassembly of knowledge".

This definition is really appropriate for Blockchain technology, since the latter consists in an assembly of different independent and complementary technologies, namely cryptography, distributed consensus and peer-to-peer protocol. However, if the Blockchain has the property of aggregation of knowledge and information, where is the intelligence?

NeuroChain is designed to answer this question by merging Blockchain technology with machine learning algorithms. NeuroChain represents a substantial evolution of existing Blockchains, enabling intelligent and complex applications beyond crypto-currencies and deterministic smart contracts, thanks to machine learning.

⇒ **It's artificial intelligence at work.**

NeuroChain is a distributed system of Bots (intelligent or rational agent). The cognitive abilities of the Bots community will constitute the collective artificial intelligence of the network. Bots interact with their environment and have 'social' interactions with other Bots.

⇒ **It's collective artificial intelligence at work.**

**NeuroChain brings intelligence and open a new world to the Blockchain**

## 12 LEGAL DISCLAIMER

Any buyer purchasing the NeuroChain's products or services expressly acknowledges technical and market uncertainties which are inherent in any business development project as presented in this White Paper (see below for risk factors) and that this project may therefore never come to fruition or may have to be abandoned, without the NCC being used. In such a case, the buyer expressly acknowledges and accepts that it will not be entitled to sue or bring any direct or indirect legal action before the courts, the arbitration bodies or any alternative dispute settlement body, either in France or abroad, against the Company, its directors, shareholders, employees or subcontractors in the event of the non-performance, non-deployment or non-implementation of the project, even in cases where its NCC have lost some or all of their value.

In addition, NeuroChain may not be held liable for any of the following:

- (i) use of services that are not compliant with the applicable terms;
- (ii) non-performance, failure, malfunction or unavailability of the services due to a third party, the buyer, a third-party product, or the buyer's breach of its obligations;
- (iii) indirect damages such as business loss or disturbance, loss of orders, operating loss, infringement of the trade mark, loss of profits or clients (e.g. improper disclosure of confidential information concerning said clients due to failure or piracy of the Platform, third-party proceedings against the client, etc.);
- (iv) loss, disclosure or unlawful or fraudulent use of user sign ons by the buyers or third parties;
- (v) suspension of access or temporary or permanent suspension of services (in particular, arising from a request issued by an appropriate administrative or judicial authority, or notification received from a third party);
- (vi) loss, alteration or destruction of all or part of the content (information, data, applications, files or other items) hosted on the infrastructure, insofar as the NeuroChain is not responsible for managing the continuity of buyers activities, and data backups in particular;
- (vii) mismatch between the services and the buyer's needs (in particular, with regard to the sensitivity of the relevant data);
- (viii) security incidents relating to use of the Internet, concerning in particular the loss, alteration, destruction, disclosure or unauthorized access to the buyer's data or details on or via the Internet; and
- (ix) damages to systems, applications and other items installed by the buyer on the infrastructure.

## 13 GENERAL DISCLAIMER

This White Paper does not constitute an offer or an invitation to sell shares, securities or rights belonging to NeuroChain or any related or associated company.

None of the information or analyses in this White Paper is intended to provide a basis for an investment decision, and no specific investment recommendation is made. Accordingly, this White Paper does not constitute investment advice or an invitation to invest in any security or financial instrument of any nature whatsoever.

This White Paper does not constitute or form part of, and should not be construed as, an offer for a sale or subscription, or an invitation to buy or subscribe securities or financial instruments. This White Paper, or any of its component parts, does not constitute the basis for, or should not be used as a basis for, or in connection with, a contract for the sale of securities or financial instruments or a commitment to sell securities or financial instruments of any kind.

NeuroChain expressly disclaims any liability for any direct or indirect loss or damage of any kind arising directly or indirectly from:

- (i) any reliance on the information contained in this White Paper;
- (ii) any error, omission or inaccuracy in said information; or
- (iii) any resulting action that may be brought.

This White Paper has been constructed in accordance with the applicable EU regulations.

### **An NCC does not represent an investment**

in a security or a financial instrument within the meaning of EU Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 relating to markets in financial instruments: NCCs confer no direct or indirect right to NeuroChain's capital or income, nor does it confer any governance right within NeuroChain;

### **An NCC is not proof of ownership or a right of control**

Control over an NCC does not grant the controlling individual any asset or share in NeuroChain, or in the Platform. An NCC does not grant any right to participate in control over the NeuroChain's management or decision-making set-up, or over Platform.

### **An NCC is not an electronic currency**

within the meaning of EU Directive 2009/110/EC of the European Parliament and of the Council of 16 September 2009 relating to access to and pursuit of the business of electronic currency institutions: NCCs are not accepted outside the Platform and an NCC do not have a fixed exchange value equal to the amount delivered at the time of their issue;

### **An NCC is not a payment service**

within the meaning of EU Directive 2007/64/EC of the European Parliament and of the Council of 13 November 2007 relating to payment services in the internal market, nor within the meaning of EU Directive N° 2015/2366 of the European Parliament and of the Council of 25 November 2015 relating to payment service 2 (DSP 2): the ICO does not involve the purchase and/or sale of NCCs and the NeuroChain business does not consist in receiving currencies against the delivery of NCCs; as such, an NCC is not a means of payment either.

### **An NCC is a cryptographic token used by the Platform.**

An NCC is a crypto-currency, i.e. an unregulated digital asset issued and controlled by its developers and used and accepted by the members of a given community.

Participation in the ICO is open to natural or legal persons acting within the scope of their professional activities as well as to any private individual acting on a non-professional basis as a simple consumer, benefitting from consumer protection laws within the meaning of EU Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights.

Documents linked to the ICO may not be transmitted or distributed to a “U.S. citizen” or to mail or email addresses in the United States of America. It is prohibited to transmit, distribute or reproduce documents linked to the ICO to or for a “U.S. citizen” or within the territories of the United States of America, in whole or in part.

To ensure their eligibility for the purchase of NCCs, buyers expressly declare that they are not a “U.S. citizen” (within the meaning of “Regulation S” of the Securities Act 1933 under U.S. law), i.e.:

- (i) any private individual resident in the United States of America;
- (ii) any partnership or business organized or established under U.S. law;
- (iii) any property of which the executor or administrator is a U.S. citizen;
- (iv) any trust of which a proxy is an American citizen;
- (v) any agency or branch of a foreign entity located in the United States of America;
- (vi) any non-discretionary account or similar account (other than a trust or property) held by a trader or other trustee for the benefit of or on behalf of a U.S. citizen;
- (vii) any discretionary account or similar account (other than a trust or trust) held by a trader or other trustee, that is organized, established or (if a private individual) resident in the United States of America; and
- (viii) any partnership or company if:
  - (a) it is organized or established under the law of a foreign jurisdiction; and
  - (b) it is formed by a U.S. citizen primarily for the purpose of investing in securities not listed under the U.S. Securities Act, unless it is organized or established, and owned, by accredited investors who are not private individuals, trusts or properties.

## 14 WARNINGS ON THE RISKS INHERENT TO THE ICO

### 1 - Risk of loss of access to an NCC due to loss of credentials:

Until it is distributed to the buyer, the said buyer's NCCs may be linked to a Company account. You can only access the Company account using the credentials selected by the buyer. The loss of these credentials will result in the loss of the NCCs. Good practices advise buyers to store their credentials securely in one or more backup locations that are geographically separated from the work location.

### 2 - Risks associated with the buyer's credentials:

Any third party that obtains access to the buyer's credentials or private keys may be able to use the buyer's NCCs. To minimize this risk, buyers must protect themselves against people gaining unauthorized access to their electronic devices.

### 3 - Legal risk and risk of adverse regulatory intervention in one or more jurisdictions:

Blockchain technologies have been reviewed by various regulatory bodies around the world, including within the European Union. The ICO has been structured to comply with EU law applicable at the time of the offer and may be subject to securities regulation under US law.

The operation of the Platform and of NCCs may be impacted by the passing of restrictive laws, the publication of restrictive or negative opinions, the issuing of injunctions by national regulators, the initiation of regulatory actions or investigations, including but not limited to restrictions on the use or ownership of digital tokens such as NCCs, which may prevent or limit development of the Platform.

Given the lack of crypto-currency qualifications in most countries, each buyer is strongly advised to carry out a legal and tax analysis concerning the purchase and ownership of NCCs according to their nationality and place of residence.

### 4 - Risk of an alternative, unofficial Platform:

Following presales and development of the original version of the Platform, there is a possibility that alternative platforms may have been established using the same open-source code and open source protocol that underlies the Platform. The official Platform may find itself in competition with these alternatives, unofficial platforms based on NCCs, which could potentially adversely impact the Platform and NCCs.

### 5 - Risk of a lack of interest in the Platform or distributed applications:

There is a possibility that the Platform may not be used by a large number of companies, individuals and other organizations, and that there may be limited public interest in the creation and development of distributed applications. Such a lack of interest could impact on the development of the Platform and, therefore, on the uses or potential value of NCCs.

### 6 - Risk that the Platform is not developed:

The main right associated with NCC is the right to access the Platform, the right to create intelligent application using the Platform and the right to become Bots in the NeuroChain network and become the first elected Bots, potentially earning NCCs. The value of the NCCs is therefore heavily correlated with the existence of such Platform and network, which has not yet been implemented. NCCs may lose part or all of their value if the Platform and/or network is never fully developed.

## **7 - Risk that the Platform, as developed, does not meet buyer expectations:**

The Platform is currently under development and may undergo significant redesign prior to its launch. For a number of reasons, not all buyer expectations concerning the Platform or NCC's form and function may be met on the launch date, including changes in design, implementation and execution of the Platform.

## **8 - Risk of theft and piracy:**

Hackers or other malicious or criminal groups or organizations may attempt to interfere with the Platform or the availability of NCCs in several ways including, but not limited to, denial of service attacks, Sybil attacks, mystification, surfing, malware attacks, or consensus-based attacks.

## **9 - Risk of security weaknesses in the Platform's core infrastructure software:**

The Platform's core software is based on open source software. There is a risk that the Company team, or other third parties, may intentionally or unintentionally introduce weaknesses or bugs into the core infrastructure elements of the Platform, by interfering with the use of, or causing loss of, NCCs.

## **10 - Risk of weakness or exploitable breakthrough in the field of cryptography:**

Advances in cryptography, or technical advances such as the development of quantum computers, may present risks for crypto-currencies and the Platform, which could result in the theft or loss of NCCs.

## **11 - Risk of a mining attack:**

As with other decentralized cryptographic tokens and crypto-currencies, the blockchain used for the Platform is vulnerable to mining attacks, including but not limited to, dual-expense attacks, powerful mining attacks, selfish mining attacks, and critical competition attacks. Any successful attack poses a risk to the Platform, the expected performance and sequencing of the Company's markets. Despite the best efforts of the Company's team, the risk of known or new mining attacks exists.

## **12 - Risk of the Platform failing to be used or adopted:**

While NCCs should not be considered an investment, their value is bound to change over time. This value may be limited if the Platform is not sufficiently used and adopted. In such a case, there could be few or no markets at the Platform launch, which would limit the value of NCCs.

## **13 - Risk of a tight market for NCC:**

There are currently no exchanges or trading facilities on which NCCs can be traded. If such exchanges or trading facilities do develop, they will probably be relatively new and subject to poorly understood regulatory oversight. They may therefore be more vulnerable to fraud and default than the established and regulated exchanges that exist for other products. Should exchanges or trading facilities that represent a substantial part of the NCC trading volume be involved in fraud, security failures or other operational problems, the failures of such exchanges or trading facilities may limit the NCC's value or liquidity.

## **14 - Risk of an uninsured loss:**

Unlike bank accounts or accounts in other regulated financial institutions, funds held through the Company are generally uninsured. At present, there are no public or private insurance agents providing buyers with coverage against a loss of NCCs or a loss of value.

**15 - Risk of winding-up of NeuroChain's project:**

For a number of reasons including, but not limited to, an unfavorable fluctuation in NCC value, the failure of business relationships or competing intellectual property claims, the NeuroChain project may no longer be a viable activity and may be dissolved or simply not launched.

**16 - Risk of malfunction in the Platform:**

The Platform may be impacted by an adverse malfunction including, but not limited to, a malfunction that results in the loss of NCCs or market information.

**17 - Unforeseen risks:**

Crypto-currencies and cryptographic tokens are a new, untested technology. In addition to the risks stipulated above, there are other risks that the Company's team cannot predict. Risks may also occur as unanticipated combinations or as changes in the risks stipulated herein.

## 15 RECENT REGULATORY ACTIONS

As mentioned above, operations of the Platform and of NCC may be impacted by future restrictive laws, regulations, opinions, decisions, injunctions, actions or investigations by national regulators and lawmakers.

Some regulators have already initiated formal or informal proceedings related to the regulation of ICOs and tokens, some of which are listed hereunder. This list is provided for information purpose only and do not constitute legal advice.

- **The European Securities and Markets Authority (ESMA)** published two statements on ICO on November 13th, 2017, one alerting investors to the risks involved in investing in ICOs; and the other alerting firms involved in ICOs of the need regulatory requirements.
- **The International Organization of Securities Commissions (IOSCO)** has issued on January 18th, 2018 a notice cautioning investors against the "clear risks" associated with ICOs.
- **The United States Securities and Exchange Commission (SEC)** issued (i) a report dated July 25th, 2017 stating that tokens offered by the company The DAO were securities within the meaning of the 1933 Securities Act, and (ii) an "investor bulletin" informing potential investors on ICOs.
- **The United Kingdom Financial Conduct Authority (FCA)** issued a statement on September 12th, 2017 warning potential investors about the risks associated with ICOs.
- **The Canadian Securities Administrators (CSA)** issued a "staff notice" dated August 24th, 2017 in which it states that ICOs might be governed by Canadian securities laws (knowing that tokens would, however, not always constitute securities for the purpose of such laws) or by Canadian derivative laws (if the products issued qualify as derivatives).
- **The Israel Securities Authority (ISA)** published a statement dated August 30th, 2017 announcing that it would organize a committee to study the applicability of securities law to ICOs. Both Israel's Finance Ministry and its central bank have issued public warnings concerning virtual currencies and possible risks. The ISA and the Tel Aviv Stock Exchange will soon introduce guidelines to regulate ICOs, as well as to allow for traded companies to engage in bitcoin and other digital currency ventures.
- **The People's Bank of China**, together with other Chinese regulators, issued a statement dated September 4th, 2017 prohibiting token fundraising transactions. Companies that have already launched an ICO are required to refund the tokens issued.
- **The Monetary Authority of Singapore (MAS)** released a statement and a Guide dated August 1st, 2017 concluding that some tokens might be qualified as securities within the meaning of the Singaporean Securities and Futures Act. The MAS added an advisory on August 10th, 2017 to advise consumers to be mindful of potential risks of digital token and virtual currency-related investment schemes and launched on November 21th, 2017 a consultation of a Proposed Payment Services Bill on cryptocurrencies.

- **The Securities and Futures Commission (SFC) of Hong Kong** made a declaration on September 5th, 2017 in which it stated that tokens may qualify as securities under the Securities and Futures Ordinance. On 9 February 2018, the SFC issued an announcement that: it has taken regulatory action against a number of cryptocurrency exchanges and issuers of ICOs in breach of licensing and authorization requirement; it has sent letters to cryptocurrency exchanges in Hong Kong or with connections to Hong Kong warning them that they should not trade cryptocurrencies which are "securities" without relevant licenses; it has also sent letters to several ICO issuers, and "will continue to closely monitor ICOs, and will not tolerate any violations of the securities laws of Hong Kong"; and it "may take further action where appropriate", in particular against non-compliant cryptocurrency exchanges and/or those which are repeat offenders.
- **The Financial Supervisory Commission (FSC) of South Korea** declared, on September 3rd, 2017, that it established a "joint task force meeting" to discuss crypto-currencies regulatory framework. During the inter-agency gathering held on December 4th, 2017, South Korea's government established a second task force to regulate cryptocurrencies. Since then, the South Korean regulators have implemented fresh measures to regulate cryptocurrency exchanges, including a ban on opening anonymous cryptocurrency accounts, and a complete ban on foreigners and minors from trading through cryptocurrency accounts. Both measures took effect from January 30th, 2018. However, the South Korean regulators seem to be rethinking the ban at the moment.
- **The Financial Market Supervisory Authority (FINMA) of Switzerland** published on February 16th, 2018, the Guidelines for Enquiries Regarding the Regulatory Framework for ICOs. In assessing ICOs, FINMA will examine in a case-by-case approach whether the ICO complied with anti-money laundering regulations and investor protection and information, and will focus on the economic function and purpose of the tokens issued by the ICO organizer. FINMA highlighted the underlying purpose of the token, their tradability and transferability as key factors of its assessment and classified tokens in categories.
- **The Australian Securities and Investments Commission (ASIC)** published on September 2017 the Information Sheet 225 as guidance about the potential application of the 2001 Corporations Act to businesses conducting ICOs. According to this document, an ICO, depending on how it's structured, could be qualified as a managed investment scheme, as a public offer and/or as an offer of derivatives.
- **The Abu Dhabi's Financial Services Regulatory Authority (FSRA)** released guidelines on crypto currencies and ICOs dated October 8th, 2017, in which it specified that (i) existing KYC would be applicable to ICOs and (ii) some tokens, on a case-by-case basis and depending on how they are structured, may be classified as securities while others may be classified as commodities.
- **The French Financial Markets Authority (AMF)** publishes on February 22th, 2018 (i) an update on the "UNICORN Program" to provide issuers with a framework for their ICO and to explore potential future regulatory actions; (ii) the summary of responses to the public consultation on ICOs which presented three possible regulatory options: promote a best practice guide without changing existing legislation, extend the scope of existing texts to treat ICOs as public offerings of securities and propose new legislation adapted to ICOs: this last option of an ICO-specific regulation received the strongest support among the respondents and they are also in favor of an information document to inform buyers and allow for the identification of the participants of the ICOs, the establishment of rules making it possible to ensure the escrow of funds raised, and the setting up of a mechanism to prevent money laundering and terrorist financing; and (iii) the analysis on the legal qualification of the cryptocurrency derivatives which concluded that cash-settled cryptocurrency contract may qualify as a derivative, irrespective of the legal qualification

of a cryptocurrency, and online platforms which offer cryptocurrency derivatives fall within the scope of MiFID II and must therefore comply with the authorization, conduct of business rules, and the EMIR trade reporting obligation to a trade repository.

Moreover, France has adopted an Ordinance n° 2017-1674 dated December 8th, 2017 – expected to enter into force at the latest by July 1st, 2018 – in application of the law dated December 9th, 2016 on transparency, anti-corruption and modernization of economic life (Sapin II) in view of adapting French legislation to allow for representation and transmission, through a DLT, of certain financial securities.

- **The Japanese Financial Services Agency (FSA)** published an investor alert on October 27th, 2017 underlying the “high risks” associated with ICOs (i.e. token volatility and likelihood of fraud) and warning issuers and investors that ICOs, depending on how they are structured, may fall within the scope of the Japanese Payment Services Act and/or of the Japanese Financial Instruments and Exchange Act.
- **The New Zealand Financial Markets Authority (FMA)** published a statement dated October 25th, 2017 on ICOs, explaining that the specific characteristics and economic substance of an ICO will determine if the token should be classified as a financial product. More importantly, the FMA specified that “all tokens or cryptocurrencies are securities under the FMC Act – even those that are not financial products”.
- **The Gibraltar Financial Services Commission (GFSC)** published on September 22th, 2017, a new regulatory framework for Distributed Ledger Technology (DLT) which provides consumers and businesses legal protection based upon nine key statutory regulatory principles and the new legislation allows Distributed Ledger Technology (DLT) firms to operate legally within the established regulatory framework.
- **The Federal Financial Supervisory Authority (BaFin) of Germany** published on February 20th, 2018 a notice stressing that market participants need to closely assess the character of the respective token, e.g. whether it forms a financial instrument as per MiFID II, a security or constitutes an investment pursuant and subject to respective regulations.

## 16 KNOW YOUR CUSTOMER PROCEDURES (KYC)

As part of the Know Your Customer procedure (KYC), anyone wishing to acquire NCCs will have to provide NeuroChain with the following minimal details via the dedicated ICO website prior to purchasing NCCs:

- Surname and first name (for private individuals) / company name (for companies);
- Country of tax residence;
- Address;
- E-mail address;
- Proof of ID.

Other additional information may be required at the actual time of registering for the ICO (including but not limited to information on origin of the funds)