SCIENCEROOT

Scienceroot

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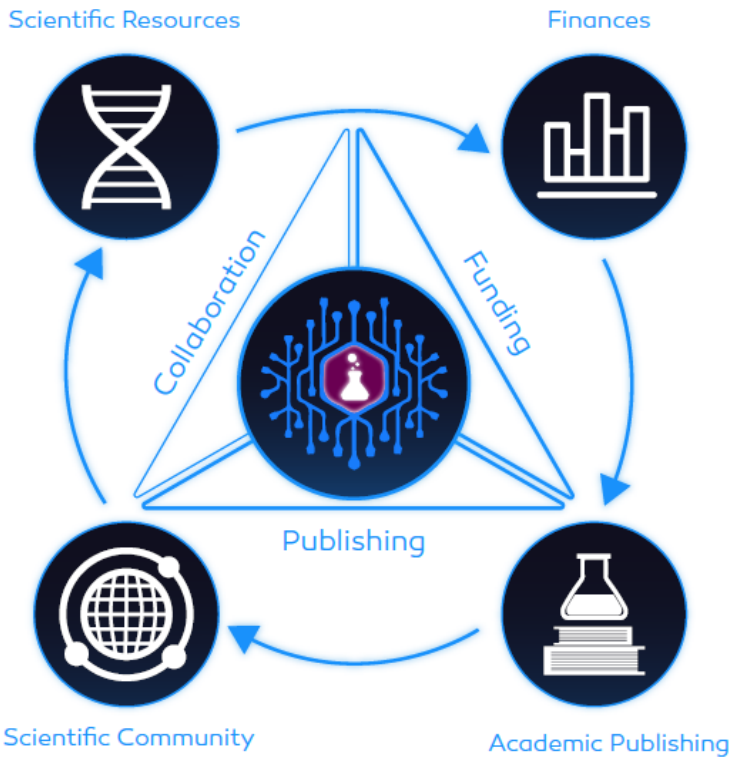
1 Introduction

Scienceroot aims to transform the scientific and research community using blockchain technology. Our goal is to create an ecosystem where anyone in the scientific community around the globe will have the ability to gather funding, interact, discuss research ideas, collaborate and in the end, publish their work through a more efficient, intuitive and transparent platform. Our scientific ecosystem will be powered by its own unique currency called **Science Token** (**ST**), which will be used to exchange funds, submit articles to our journal, access content and reward parties involved.

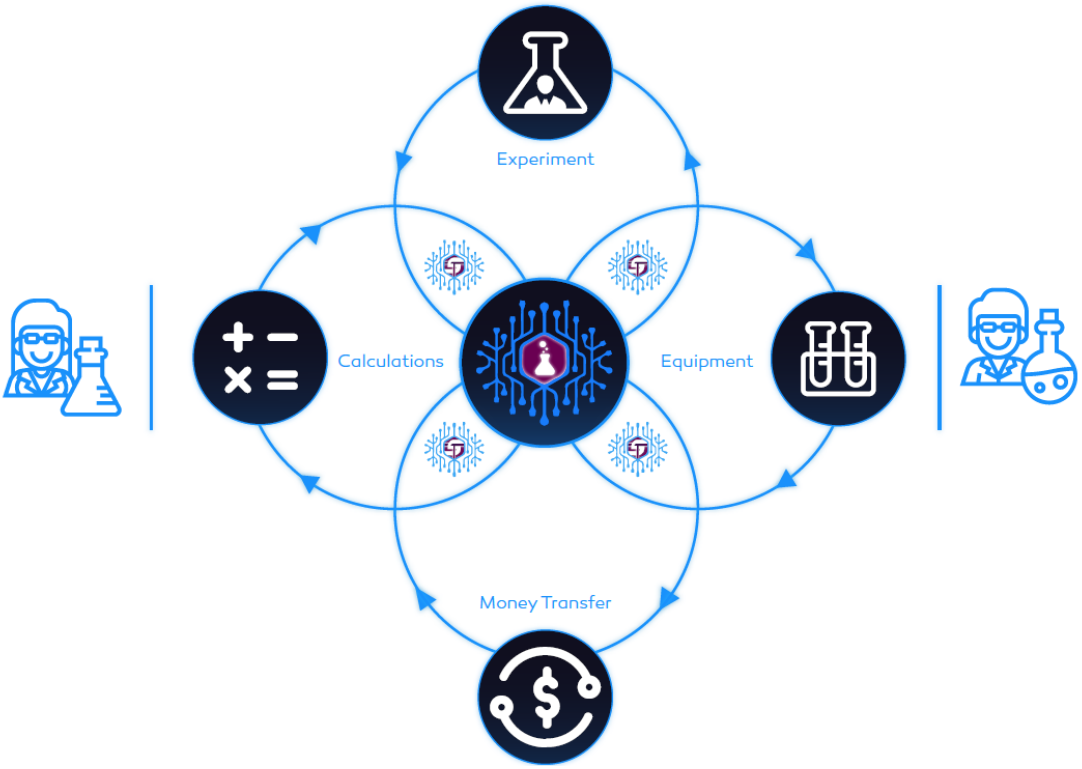
Scienceroot will integrate all the critical functionalities needed by researchers, scientists and academics, making their day to day lives easier and allowing them to focus on maximizing their impact in the scientific world. The reason why we decided to combine **Collaboration**, **Funding** and **Publishing** is because they are the 3 **key pillars** of the scientific/research lifecycle. Each researcher, scientist and academic has to go through them in order to publish, advance and disseminate their results.



Currently many of these pillars are spread out on different platforms. By combining them, we are creating the platform which will change the scientific community for the better. To take it to the next level we add blockchain to create the worlds most efficient, intuitive and transparent scientific ecosystem.

2 Collaboration Platform

The first part of Scienceroot will be the collaboration platform. This will use as a decentralized social network platform for academicians. Here they can showcase their work, connect with peers, seek new collaborations, set up private groups, find solutions, create and manage projects. Everything will be governed by blockchain smart contracts and therefore the need for middlemen is eliminated. We will incorporate some of the known elements from social media platforms like LinkedIn, Twitter and Facebook such as : creating profiles, implementing a ranking system based on contributions to a certain field, liking and following researchers/publications, endorsing skills, sharing news items and updates, and many others.

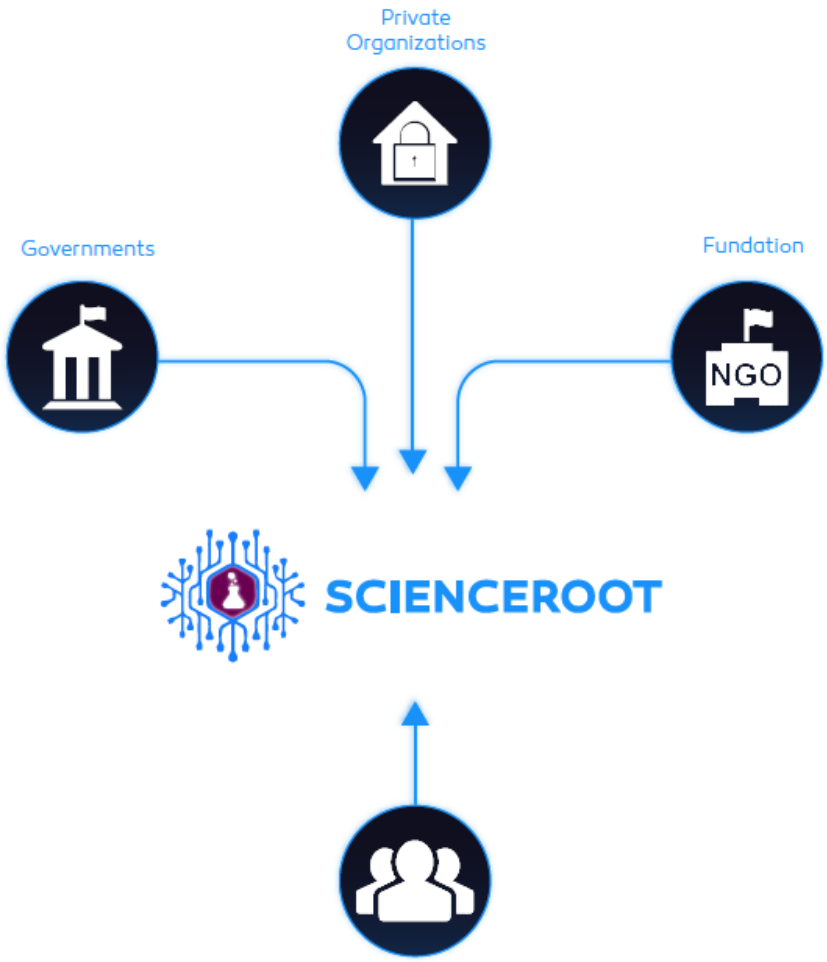


2.1 Benefits

Yet the most important feature will be the underlying cryptocurrency on which the whole platform will rely. It will offer the possibility for users to reward peers for their contributions, delegate work in projects, market their work, similar to already known freelancing platforms but without any middlemen since this can be achieved with the help of smart contracts.

3 Funding Platform

The second part will be our funding and job platform. Our target is to create a centralized portal that offers a wide list of grants from all around the world. The portal will be open to our registered users searching for national or international funding opportunities and organizations looking to recruit or market their grants to a national and international audience.

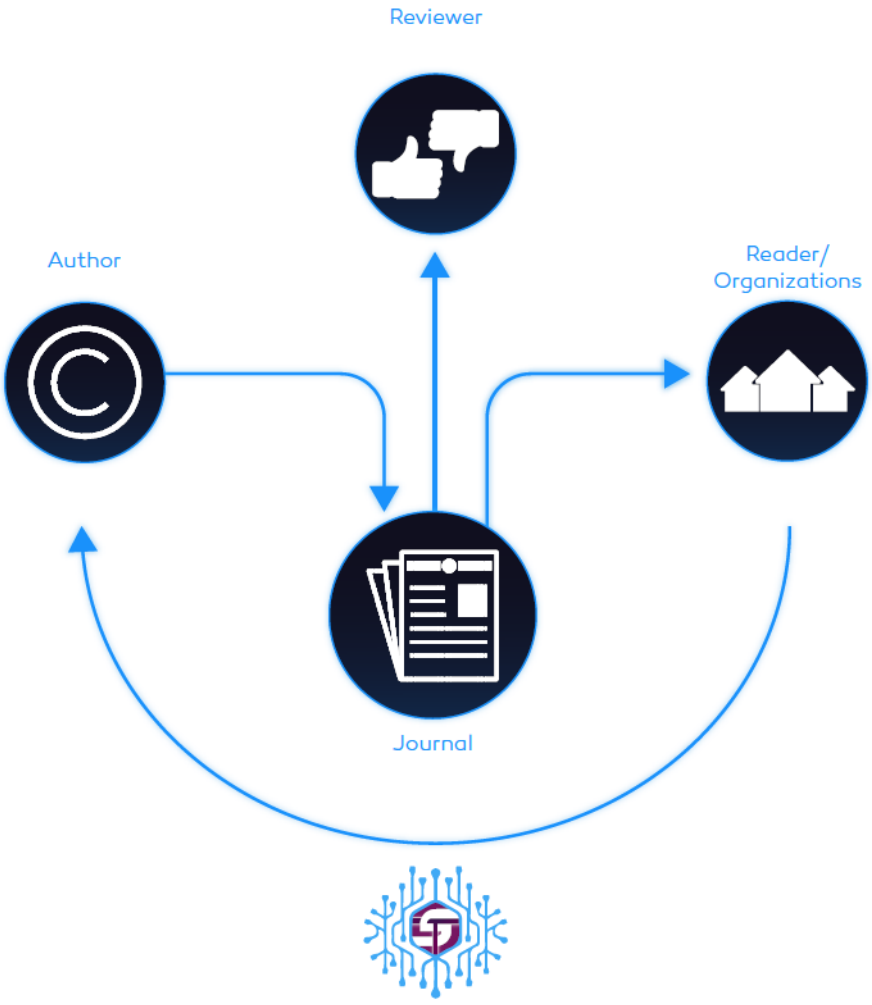


3.1 Benefits

This will allow scientists, researchers and academics to find the suitable funding option, and allow them to focus on the scientific application itself rather than on funding details. The offered funds will be in fiat currency and our own currency Science Token(ST), while the decision on awarding them will remain with the offering organization.

4 Journal

The third part of Scienceroot will be our academic journal. One of the core features of our journal platform will be the publishing process. By leveraging blockchain and smart contracts we can guarantee submitters immutability, security, transparency and trust. We will also implement artificial intelligence for proof reading, content references and overall article format to assist our editors. This will in the future speedup the initial editing process and lower editorial cost. By enabling this feature from the very beginning, we can train our artificial intelligence algorithm based on published papers.



4.1 Benefits

The second and most important feature will be our unique rewarding process which brings profit to anyone who decides to publish in our Journal. Academicians will obtain profits from their published work and peer-reviewers will receive compensation for their contributions. This will be achieved using blockchain smart contract technology to ensure an automatized and unbiased process.

5 Background Information

5.1 Publishing

Regardless of the small audience, scientific publishing is a remarkably large industry. The total size of the global scientific, technical and medical (STM) market was estimated by Outsell at 25.2 billion USD in 2013 and is predicted to grow at about 4% annually as seen in Figure 1.

Figure 1: Scientific publishing market cap analysis according to STM. [1],[2]

In order to create profit, a **normal publisher** has to cover several costs like: paying writers for the articles, editing, proof editing, design, shape and distribution. After all this is successfully completed, a good publisher makes a profit of around 15%. The same way goes for **publishing a scientific article**, except that the publisher avoids most of the costs. Researchers write articles about their own work - mostly funded by governments and research institutions - **then send them to the publishers for free**. The publishers hire scientific editors, who verify whether the manuscript is or not within the scope of the journal. Then, the greatest burden falls on the shoulders of other researchers who have to evaluate the validity and legitimacy of the work in a process called **peer-review, again for free on a volunteer basis**. After that, the publishers sell rights to their journals, so that fellow scientists can access the articles. There were about 28,100 active scholarly peer-reviewed English-language journals in 2014 and most of them lack to compensate their contributors and reviewers.

We decided to challenge this approach. Peer-review and collaboration is fundamental to the scholarly communication. According to the STM report [2] a typical reviewer spends 5 hours per research paper and reviews about 8 articles per year. These numbers are so small because contributors are not rewarded for their time. By offering well deserved rewards to our contributors we believe to drive the scholarly community to new heights. Despite the transformation of journals over the years, the researcher's core motivation for publishing still remain unchanged, focused on securing funding and furthering the authors career.

The advantage of current science journals is based on the necessity for researchers to publish their work in order to be acknowledged. Our goal is to create an ecosystem using blockchain technology, to benefit all the parties involved in the research process, and perhaps in the future to be the connection point for the global science community.

5.2 Funding

Research funding covers any financing for scientific research, in both areas of science and social science. This is obtained through a competitive process, in which potential research projects are evaluated and only the most promising receive funding.[3]This process is normally run by the government, corporations and foundations in which the first two are the major contributors. To put things in perspective here is a sample list (Table 1) of how much is being spent on research and development (R&D) in the recent years.

Rank	Country/Region	Expenditures on R&D (billions of US$)	Year
1	United States of America	473.4	2013
2	China	409	2015
3	European Union	388.3	2014
4	Japan	179.8	2014
5	Germany	109.4	2014
6	South Korea	91.6	2014
7	India	66.5	2015
8	France	60.0	2013
9	United Kingdom	44.8	2013
10	Russia	42.6	2013
11	Canada	25.7	2013

Table 1: Top list of countries/regions by research and development spending [4]

Granting agencies inquire about the researchers background, facilities used, the equipment needed, time involved and the purpose of the scientific outcome. This process is time consuming due to the widespread variety of funding opportunities which are available to researchers. In order to be able to apply for funding, a scientist has to find a grant which best suits his needs. One can easily lose sight through all that is offered when searching for funding. A quick search will reveal a lot of grant-related scams, confusing ads, and a lot of subscription-based directories. The need for a go-to transparent and centralized platform which connects applicant with funding organizations is now bigger than ever.

5.3 Team

Vlad Günther is a Consultant, Engineer and Project Manager with 6 years of experience in Enterprise IT, Finance and Management. He has worked for major companies like Microsoft and Bosch and is experienced in Cloud platforms, VoIP systems, enterprise architecture and Data Security. He is passionate about blockchain and cryptocurrencies, and inspired by decentralization.

Alexandru Chirita is a physicist currently working on finishing his Master studies at the University of Vienna, where he will soon be starting as a Ph.D student, doing molecular dynamics simulations. Having to work with researchers and being inspired by them, he came up with the concept of Scienceroot to help change the current status of the scholarly communication and publishing ways.

Frederik Huschebeck is an experienced Backend Developer with extensive knowledge of Blockchain configuration, Mining and Smart Contract Development. He studied Computer Science at the University of Dresden, Germany. His main Programming languages are C#,Java, Python and C++.

Michael Schönbeck studied International Affairs at the Rhine-Waal University of Applied Sciences in Kleve, Germany. Over the years he gathered a lot of inter-cultural experience abroad in Jordan, China, Russia and Romania. He is also knowledgeable in SQL Server and Azure technologies from working at Microsoft. His first contact with cryptocurrencies was in 2013 when he first found out about Bitcoin, intrigued by the potential he began researching blockchain. He has a strong belief that blockchain can solve real world problems.

Sven Seemann is a frontend and backend developer with experience in developing healthcare software. His main programming languages are Java, CSS, HTML and Javascript. After his first contact in 2017 with blockchain, he realized the potential it has to improve the scientific community.

Luca Tisu is experienced in Organizational Development and Human Resources. Having a degree in Psychology he decided to pursue Organizational and Occupational Health Psychology to provide companies with assistance in growth and value creation. Being a Human Resources Scientist-Practitioner, he is driven by the change needed in the scientific community, experiencing first-hand the downsides of the status quo.

6 Roadmap and Vision

Scienceroot is not only aiming to disrupt the current scientific publishing model but also revolutionize and improve the scientific community in all aspects possible. We are creating a scientific publishing model which will reward and sustain researchers instead of maximizing our profits. We believe that this model will not just bring benefits to scientists and researchers, but also improve the quality of their work and motivate them to push science to new boundaries. By interconnecting it with our own collaboration and funding platform we can create a unique scientific ecosystem where science will prosper.

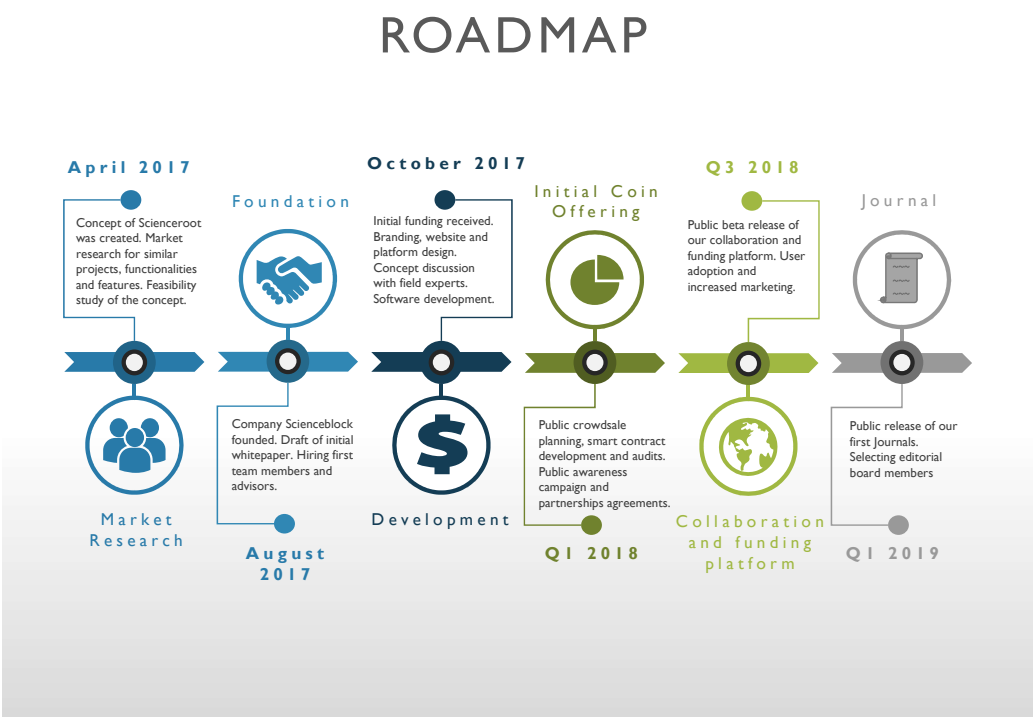


Figure 2: Scienceroot Roadmap

References

[1] M. Mabe and M. Ware, "*The STM report: An overview of scientific and scholarly journals publishing*," 2009.

[2] M. Ware and M. Mabe, "*The STM Report: An overview of scientific and scholarly journal publishing*," 2015.

[3] Wikipedia, "*Funding of science*." https://en.wikipedia.org/wiki/Funding_of_science.

[4] Wikipedia, "*Funding of science*." https://en.wikipedia.org/wiki/List_of_countries_by_research_and_development_spending.

[5] J. Schmitt, "*Can't Disrupt This: Elsevier and the 25.2 Billion Dollar A Year Academic Publishing Business*." https://medium.com/@jasonschmitt/can-t-disrupt-this-elsevier-and-the-25-2-billion-dollar-a-year-academic-publishing-business-a

[6] M. Taylor, "*The obscene profits of commercially scholarly publishers*." https://svpow.com/2012/01/13/the-obscene-profits-of-commercial-scholarly-publishers/.

[7] Wiley, "*Are scientific collaboration networks advancing research?*." https://hub.wiley.com/community/exchanges/discover/blog/2015/05/22/are-scientific-collaboration-networks-advancing-research.

[8] T. Economist, "*Of goats and headaches*." http://www.economist.com/node/18744177.

[9] T. Reller, "*Elsevier publishing – a look at the numbers, and more*." https://www.elsevier.com/connect/elsevier-publishing-a-look-at-the-numbers-and-more.

[10] /u/rhiever, "*Top 40 countries by the number of scientific papers published*." https://www.reddit.com/r/dataisbeautiful/comments/20k5dk/top_40_countries_by_the_number_of_scientific/.

[11] M. Panter, "*Understanding Submission and Publication Fees*." http://www.aje.com/en/arc/understanding-submission-and-publication-fees/.

[12] IPFS, "*IPFS is the Distributed Web*." https://ipfs.io/.

[13] Ethereum, "*Ethereum Whitepaper*." https://github.com/ethereum/wiki/wiki/White-Paper.

[14] P. D. med. Sönke Bartling, "*Blockchain for Science and Knowledge Creation*." https://docs.google.com/document/d/1Uhjb4K69l0bSx7UXYUStV_rjuPC7VGo0ERa-7xEsr58/edit.

[15] J. van Rossum, "*Blockchain for Research*." https://figshare.com/articles/Blockchain_for_Research/5607778/1.