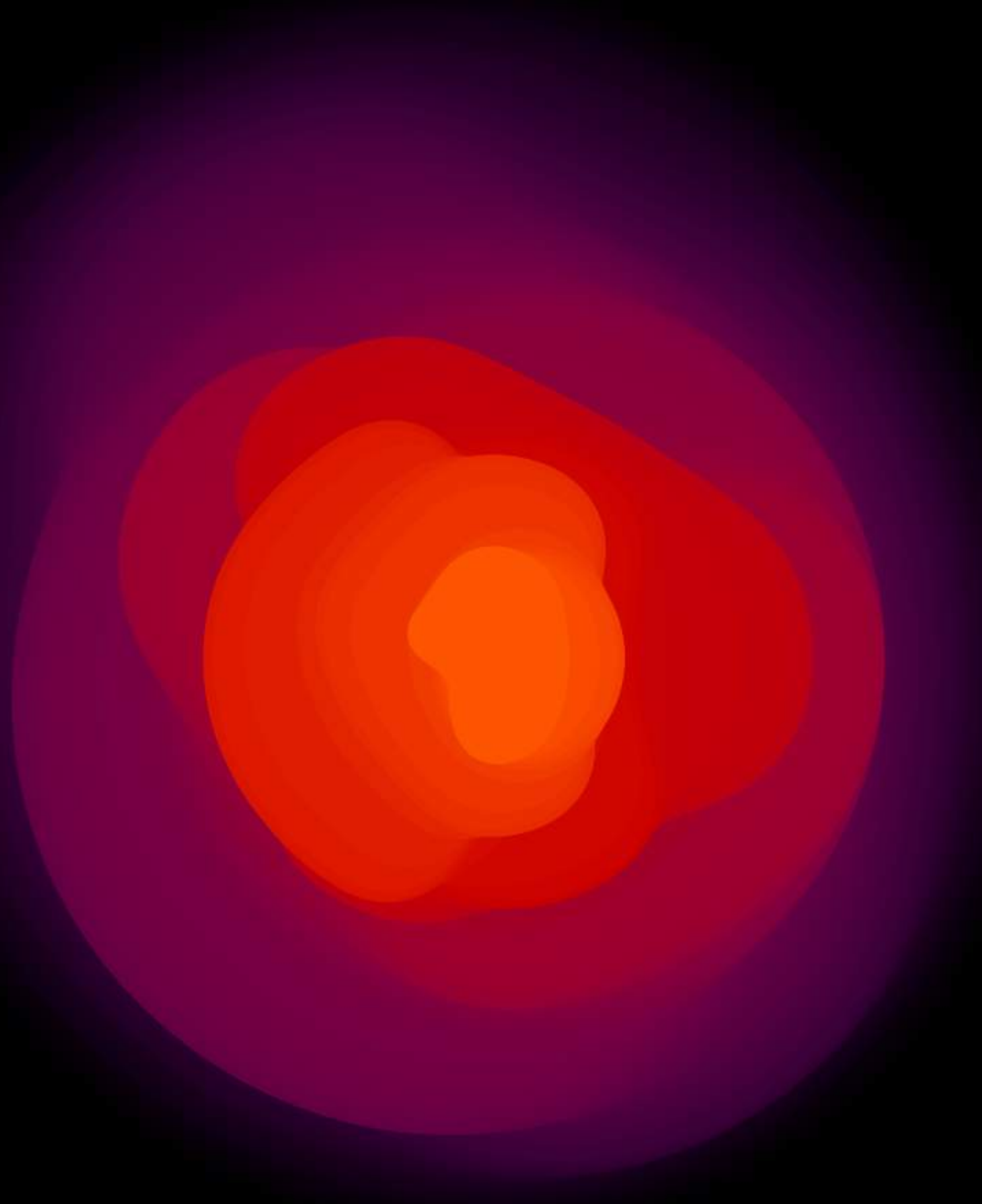




lifesci blockchain will securely store and enable exchange of the world's health data for the benefit of mankind.



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# Abstract

## **Enabling life science solutions offering a Platform as a Service (PaaS) with a P2P digital network using Blockchain and AI.**

lifesci is building a distributed ledger platform to securely hold health data for the benefit of mankind. [lifesci blockchain will securely store and enable exchange of the world's health data for the benefit of mankind]

lifesci is creating the world's first AI-powered, distributed ledger platform for secure healthcare data exchange and intelligent data curation. By enabling the secure encryption, storage and exchange of medical and life sciences data, lifesci will create a first of its kind digital healthcare ecosystem. Within this ecosystem the possibilities for research, innovation, entrepreneurship, and community are limitless.

Healthcare data is not easily accessible, exchangeable or understandable with limited verification of trusted sources and poor curation. Even in this epoch of global information dissemination, this creates a potentially fatal data-asymmetry whereby patients rely on the skill or luck of their physician to provide them with the best medical solution. The elite or ultra-wealthy tend to find the best physician-scientists with the best network to access scarce cutting-edge medicines. But even these top doctors may have limited knowledge of the medical innovation outside their network: Medical breakthroughs in China are rarely reported in Western medical journals and if it is, it is it may be years out of date. Ironically, at the same time, the same top doctors cannot find enough patients for the latest innovative drugs. Furthermore, breakthrough new medicines still take ~10 years to develop!

Similarly, many medicines that have been used for years are later found to be beneficial for a completely different disease but only years later - because the ability to rapidly analyse and synthesize this data is restricted to a few individuals, limited in scope and slowly updated (not real-time).

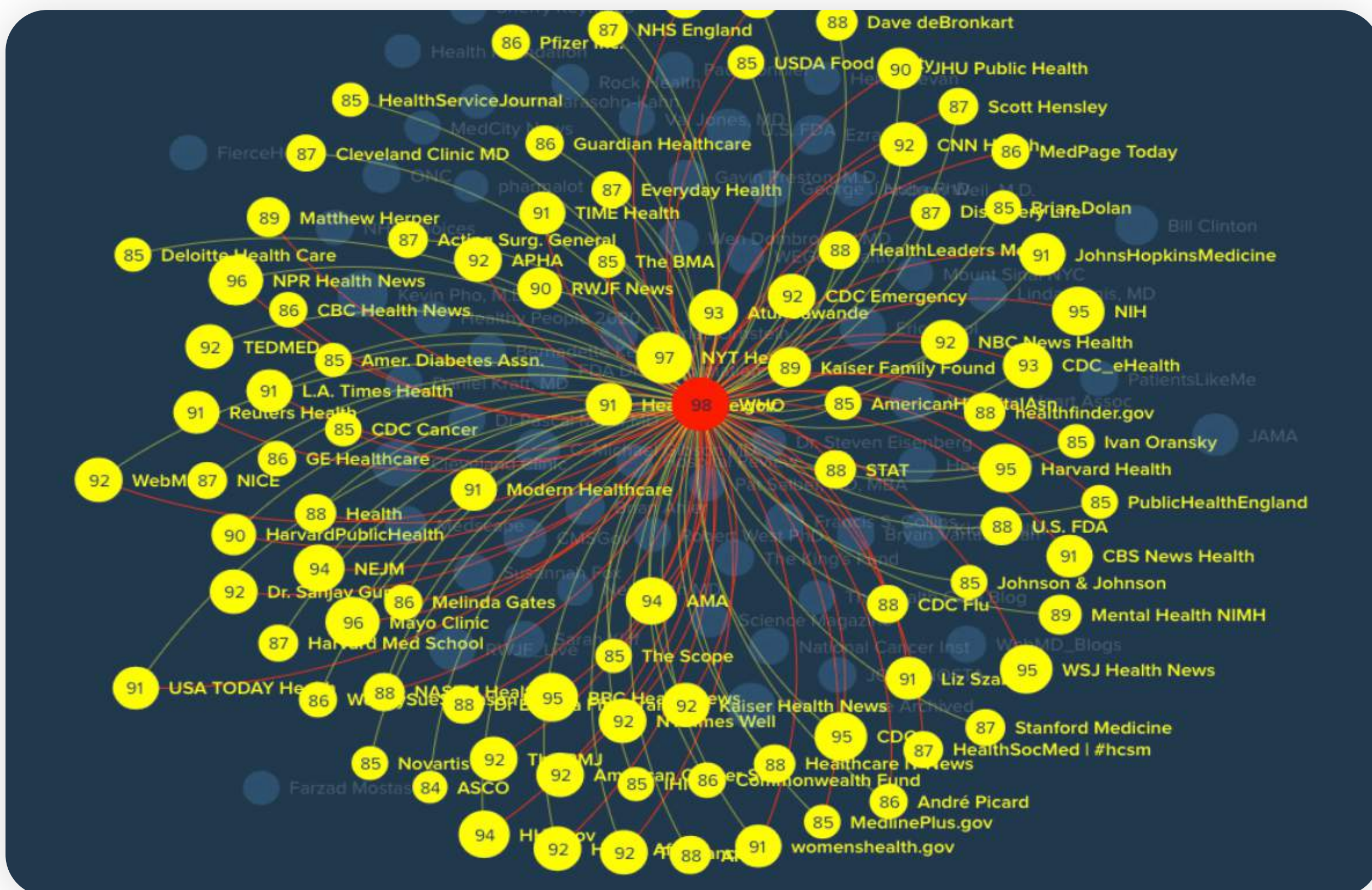
lifesci distributed ledger technology (dlt) platform has the potential to transform this paradigm. Bridging this critical data science need and enabling secure digital storage with benevolent curation and the potential for macrolevel permission-based interrogation of anonymised and encrypted data for the benefit of mankind. Enabling patients to safely share their medical problems and find the best advice. The lifesci data platform will not only democratizes access to health data but its infinite scalability enables patients, physicians, and researchers to collaborate in finding medical solutions.

This collaboration model is permission-based and thus customisable at an individual user level. Finally, by providing blockchain encryption at the source to the owner of the data - lifesci provides trust.



Trust that you remain the owner of your data, trust that you control with whom you share the data, trust that data is shared securely and that you can revoke or modify that exchange of data at any time. This creates a true digital ecosystem within which innovation, data exchange, and the community can flourish.

There are strong incentives for the community to grow. If a physician is utilising the quality and quantity of health data could provide the unique big data sets that are not available in a curated, intelligently ordered platform. The lifesci dlt aims to provide this platform to store and curate this big data set to enable real-time interrogation and data visualisation.



Data visualisation for top 100 social media influencers in healthcare mapped through the source of WHO (World Health Organisation). Source [rightrelevance.com](https://rightrelevance.com)

lifesci is led by an experienced team of Blockchain, AI, Big data and Digital sectors and healthcare experts. The scientific aspect of the data project will be partnered with Celixir plc - a leading Biotech company founded by Prof. Sir Martin Evans Nobel Laureate in Medicine in 2007.



# Disclaimer

This document describes various aspects of the lifesci project, the lifesci (LSCI) Token Sale, and the economics of both. This document contains forward-looking statements, subject to risks and uncertainties that could cause actual results to differ materially.

Through this document, lifesci provides information relating to its business model, token DNA, crowdsale approaches and opportunities to buy or sell a new crypto unit. You should not construe any such information or other content available through this document as legal, financial or tax advice. You alone bear the sole responsibility of evaluating the merits and risks associated with the use of any information on this document before making any decisions based on it.

All information on this document, including opinions, charts, finance, news, data, research, and analysis is provided as specific general research, most of it from identified authors and sources, and does not constitute any investment advice. Before deciding whether or not to take part in any crowdsale, please carefully consider your investment objectives, level of experience and risk appetite. Do your research and homework and do not invest funds or financial resources than you cannot afford to lose.

This document is for informational purposes only and does not constitute an offer or solicitation to sell shares or securities in lifesci or any related or associated company. Any such offer or solicitation will be made only by means of a confidential offering memorandum and in accordance with the terms of all applicable laws of the country of incorporation of lifesci.

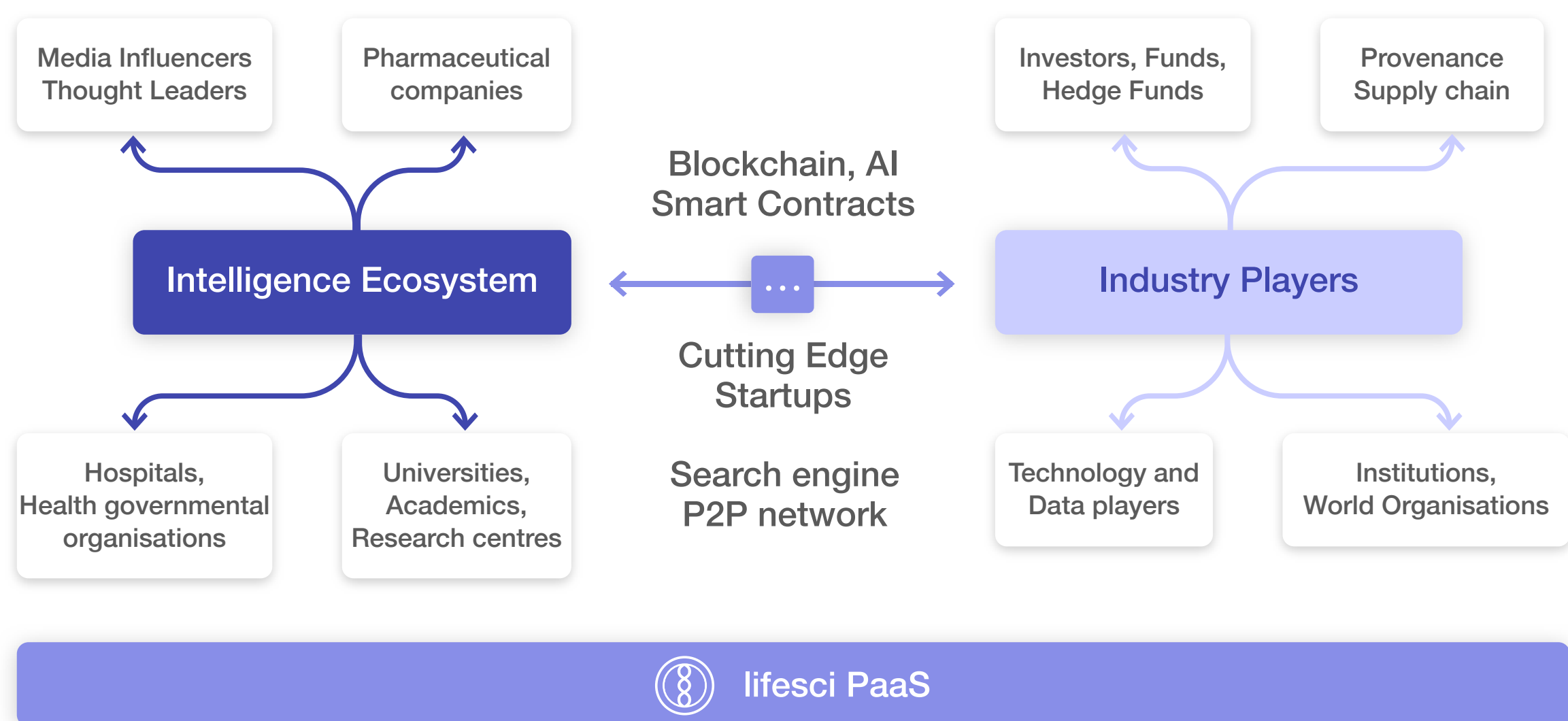
lifesci will do KYC/AML to any token participation done through an independent partner that will carry out full due diligence prior to tokens being released to participants. The token sale will be done through a broker partner with proper due diligence considered.

lifesci is not liable for any possible claim for damages arising from any decision you make based on the information made available to you through this document. By providing information through this document, lifesci is neither recommending the purchase or sale of financial instruments or assets issued by lifesci or any associated company nor are they endorsing services provided by any organisation.

# Summary

**lifesci - Addressing life science problems with a proprietary Peer to Peer digital network using Blockchain and AI PaaS (Artificial Intelligence Platform as a Service).**

lifesci is being designed as an AI, Blockchain, P2P network and search engine platform that creates new healthcare solutions by involving and embracing, input, ideas, services and capital from online communities, scientists, cutting-edge startups and investors (as opposed to traditional fragmented suppliers or centralised old systems and databases). Thereby creating a platform that combines: integrated data (machine learning) + life science experts + capital all held within a highly secure database using military grade cryptography i.e. using Blockchain technology.

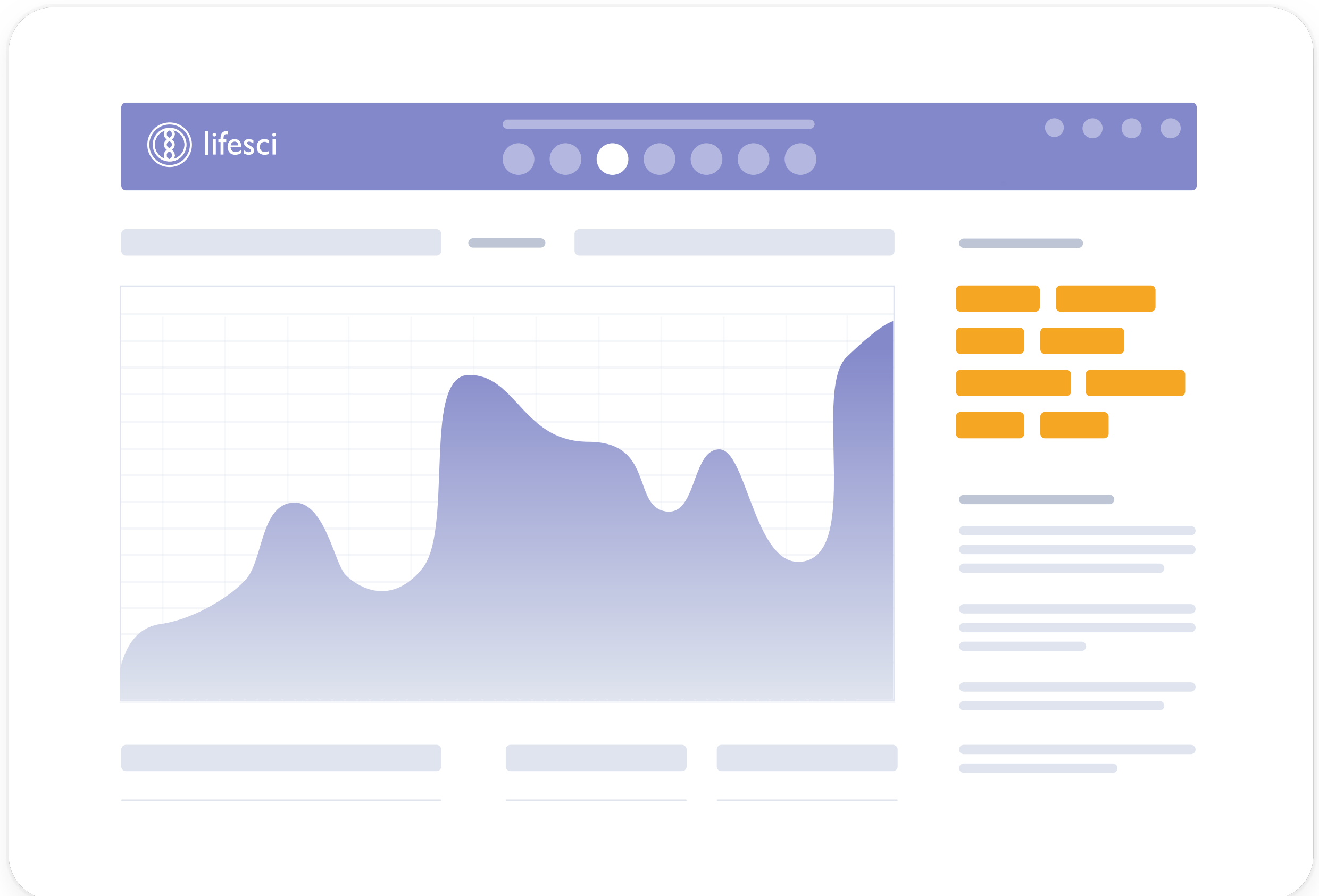


lifesci aims to help speed up the time it takes to go from idea to implementation while giving permission access to updates of research, trials, and patents. The platform enables insights and relevant investment information that it shares with a network of global organisations, investors, and teams working on leading health-focused solutions.

lifesci PaaS offers:

- A digital exchange of research papers and patents from universities and companies working on cutting-edge solutions for patients;
- Big data intelligence ecosystem and tools that comprehends patient, scientific research, IP, academic innovation, financial, investment and industry insights;
- Search engine giving access to the latest insights, patents, papers and influencers;
- News and real time macro-data in the healthcare industry;
- Trends and information to support the industry players, funds and VCs enabling investment decision making;

- A network and search engine of cutting edge companies, startups, influencers, and professionals that lifesci will partner with;
- General evolutionary tools, open APIs for the healthcare industry and the life science ecosystem.



Data visualisation of the lifesci dashboard PaaS

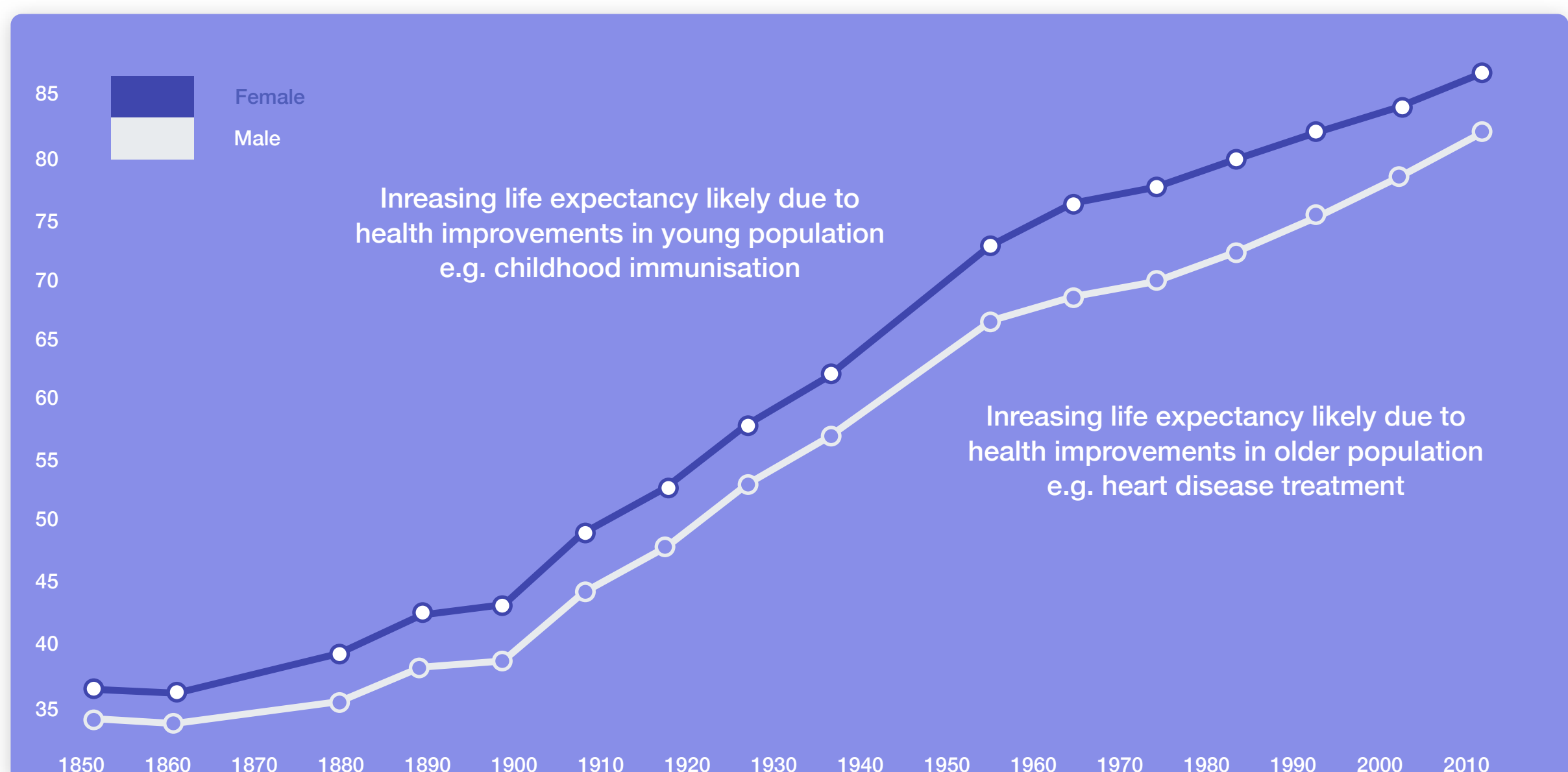


# Executive Introduction

Although average life expectancy and quality of life have progressed, the health care system faces the challenge to innovate fast enough in order to meet patients' rapidly evolving needs. The sector is struggling to find and implement the appropriate digital transformation to meet growing global health challenges and adapt to upcoming disruptions.

As such, doctors still can not always find their patient's' complete medical records. Outdated IT systems often mean hospitals and medical professionals are not always able to match patient data and create economies of scale. Counterfeit drugs invade the market in developing countries, causing great public health risks, which undermines patients' not trust in the pharmaceutical industry to release effective drugs on to the market. Furthermore, the 2018 General Data Protection Regulation (GDPR source [https://en.wikipedia.org/wiki/General\\_Data\\_Protection\\_Regulation](https://en.wikipedia.org/wiki/General_Data_Protection_Regulation)) is accelerating the need for efficient data management systems, respectful of patient's' privacy and ensuring security and integrity of the information.

Through the improvement of the quality of care and the arrival of new therapies, average life expectancy has increased from 43 years in 1850 to 82 years in 2015 (<https://visual.ons.gov.uk/how-has-life-expectancy-changed-over-time/>). Advances in new medicines and diagnostic techniques are driving this prolongation, while significantly improving the quality of life. These results are powered by a multi-billion dollar pharmaceutical industry which focuses on converting medical innovation into life-saving and life-altering medicines.



Life expectancy, source: Decennial Life Tables, ONS

New technologies, such as Blockchain, can enable the creation of new platforms and Big Data to create information exchange systems that can potentially unlock the true value of interoperability while addressing cybersecurity across Healthcare.

The adoption of these digital technologies will revolutionise the industry and will empower a new generation of startups and organisations to transform the healthcare industry. This reinvention of how medical professionals treat their patients, along with new patents and solutions, will alter the way the entire health and life science system can work. Speeding up transformation and creating a pathway to better information sharing and healthcare solutions will further enhance developments in this sector.

Currently, finding the best tools and funding models to support innovative companies in the healthcare and life science sectors can be quite complicated, as traditional ways of exposure to this sector are quite inaccessible (e.g. PE, VC, incubators or IPOs). Indeed, they are often exclusively carried out on a Private placement basis or underwritten by large banks and asset managers, leaving smaller investors only able to buy shares after the company has been floated. As such, it is difficult to know which startup or organisation will actually drive the right innovation, and have the proper data, team and sufficient resource to find best solutions to the biggest healthcare issues.

By leveraging Blockchain, AI technology and its own unique token (LSCI), lifesci will create a Platform as a Service (PaaS) for life sciences, Biotech, healthcare research and investment, while aggregating key data, trends, and insights, so capturing the intelligence pulse of the entire industry.

# lifesci PaaS

## **AI decentralised multidimensional and multivariate (research data and methodology):**

Discovering medical breakthrough requires complex multidimensional and multivariate analysis data and methodology. This would normally be the purview of machine learning systems. However, lifesci is able to utilise a multidisciplinary approach that combines the best in machine learning and other advanced approaches to complex problem-solving. Recent research shows that human and computers cooperating together produce better results than even supercomputers alone with the right data and methodology approach (source <http://www.sciencemag.org/news/2017/03/computers-learn-cooperate-better-humans>).

An example of this approach is “Foldit”, which allows nontechnical users to experiment with folding protein structures, a “world-changing innovation with huge implications for our ability to understand and treat disease.” source Crowd science: source <http://www.sciencedirect.com/science/article/pii/S0048733313001212> The organisation of scientific research in open collaborative projects. After a Foldit player rearranges a protein structure, a computer analyses atomic forces and interactions and identifies structural issues. This approach has been found to be 50 percent more effective than supercomputers working alone.

## **Crowdsourcing, crowd-design and crowdfunding solutions for healthcare**

In an increasing P2P economy where data is shared and requires collaboration between Universities, research institutes, investors and global entities, crowdsourcing is critical to improving operations and scalability.

Crowdsourcing in healthcare has been evolving and growing (some information can be seen Source [http://health.oliverwyman.com/drive-innovation/2016/04/field\\_report\\_future.html](http://health.oliverwyman.com/drive-innovation/2016/04/field_report_future.html) Field Report: Future of Crowdsourcing Initiatives in Healthcare) and while we can trace its roots back to 2006 there is a big opportunity to grow it as a way to find solutions to the biggest health issues humanity is facing. There are various categories that can be used with solutions that range from patient-caregiver connectivity and collaborative consumption to contagious disease surveillance. The crowd-based design has become a very popular byproduct of crowdsourcing (source <https://medcitynews.com/2015/01/8-categories-crowdsourcing-healthcare/>). Other variants include crowdfunding, Initial Coin Offering as complementary and alternative to venture capital funding, and crowd testing (an alternative to software testing).

Creating a new PaaS allows one to potentially develop new unique ways to monitor and review opportunities for the healthcare ecosystem while creating new insights. Furthermore, it helps eliminate the friction and costs of current third-party intermediaries.



Being able to coordinate patents, trends, macro data and patient care via a Blockchain AI platform alleviates unnecessary services and duplicate tests resulting in increased efficiency, lower costs and vast improvement in terms of patient care. By adhering to new rules and standards that can be managed better by smart contract technology. A data-centric distributed platform focused on patient-centered protocol supported by Blockchain technology has the potential to improve the way healthcare stakeholders, investors and industry players manage digital medical data. It also potentially will allow healthcare professionals to interact with clinical care teams so creating economies of scale that can highlight the right companies and patents to focus on, in order to improve health in general.

However, most of these innovations and technologies typically are not taking place in large pharmaceutical companies but in small Biotech, healthcare and life science startups. These organisations often discover or license/regulate the initial drug discoveries, software and undertake the riskiest early drug research. Thus gathering data on a platform backed by Blockchain can improve research, insights, and relevance.

Early investment in selected small Biotech, healthcare and life science companies is risky but may offer solutions for large problems mankind is still suffering. Scaling correctly funding opportunities for right startups will offer unique and highly attractive opportunities for investors and global organisations to look at the best way to optimise data, information, and focus. It is very common for smaller firms to discover new breakthroughs but they lack scaling and production facilities, marketing force and distribution capabilities. This is why they often sell or license their discoveries to large Pharma (research source <https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/new-frontiers-in-pharma-r-and-38d-investment>).

Sophisticated venture capitalists and seed investors have unique access that allows them to prioritise investment decisions. Biotech companies however often have limited access to capital because they are unable to gain analyst coverage (as they are still often private companies) or access a broad pool of investors. Even with the advent of Crowdfunding, few Biotech and life science companies have utilised this funding channel successfully. (research source <https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/new-frontiers-in-pharma-r-and-38d-investment>).

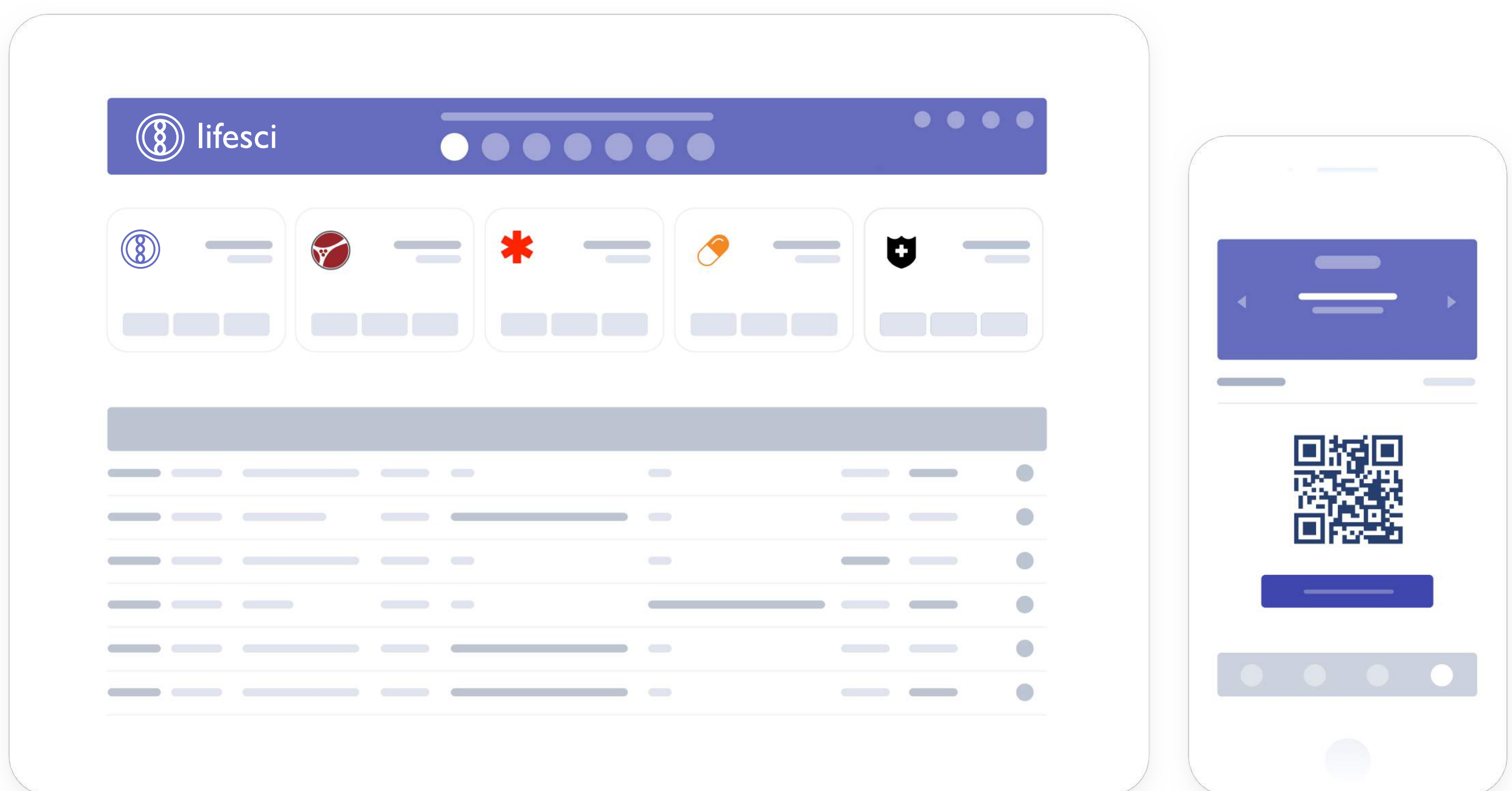
Finally, lack of liquidity is a significant issue for potential investors and Biotech companies. Most Biotech companies generate scientific and regulatory milestones that have a significant impact on valuations (research source [https://fsi.stanford.edu/sites/default/files/Ranade\\_FINAL\\_Feb\\_2008.pdf](https://fsi.stanford.edu/sites/default/files/Ranade_FINAL_Feb_2008.pdf)). But these valuations are appreciated in an illiquid private market with few investors. Similarly, investors may become trapped in private companies for a number of years with limited exit options. Liquidity acts to make the market for Biotech investing a highly inefficient and an opaque market restricting value creation for both investors and companies.

lifesci's goal is to overcome this central challenge of the illiquid, opaque market by creating a platform that provides access to early Biotech and life science firms and that provides liquidity through a utility crypto-currency, the lifesci token (LSCI).

LSCI intended to be listed on a number of cryptocurrency exchanges in multiple jurisdictions which will dramatically improve liquidity.

Currently private companies:

- Typically do not publicise or market outside of an exclusive investment club / community;
- Are often spun-out (e.g., from Universities) with no opportunity for the public to invest;
- In many cases require expensive expert scientific / technical knowledge;
- Can frequently costly expert medical / financial valuation to assess the potential of the medicine or new medical device;



Data visualisation of the lifesci dashboard PaaS

lifesci aims to provide a network of partners, institutions, startups, professionals, influencers and investors early and unique access to decentralised data and insights, through the emission of a life sciences-dedicated crypto-currency, the lifesci Coin. Thereby democratising those who are able to access Biotech and life science investment opportunities while expanding the capital available to the development of new data and solutions for the healthcare ecosystem.

# Business Model

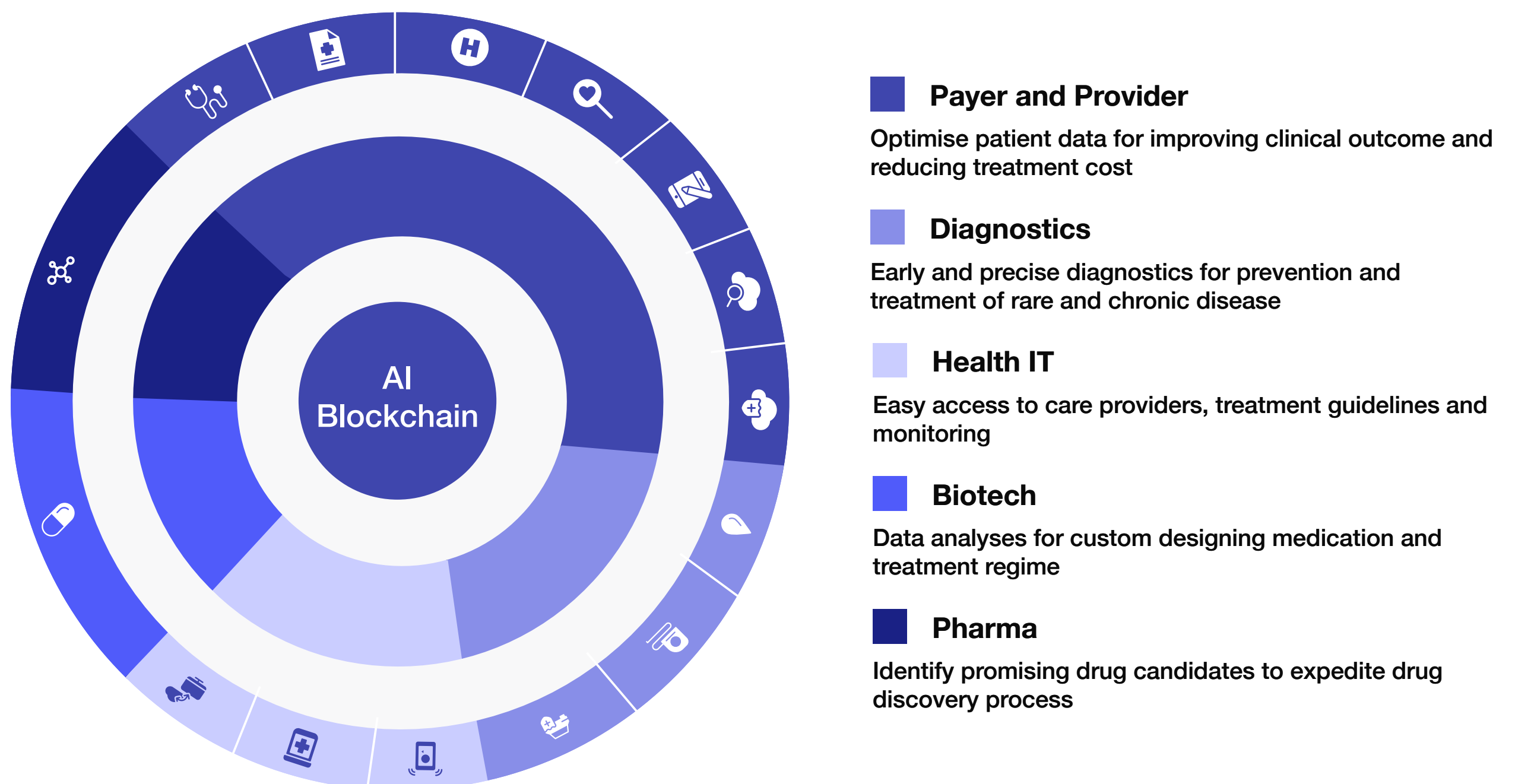
lifesci will offer a sustainable business model that has a number of core revenue streams.

The healthcare industry is a big and complex ecosystem and consumes an average of 9.3 percent of the GDP or US\$ 3,322 (PPP-adjusted) per capita across the 34 members of OECD countries (source OECD).

The overall 'connected healthcare' market – that unites new technology that's changing how users look after their health and access health services – is projected to be worth £37 billion globally and £1.9 billion in the UK by 2020, according to new PwC analysis from 2016.

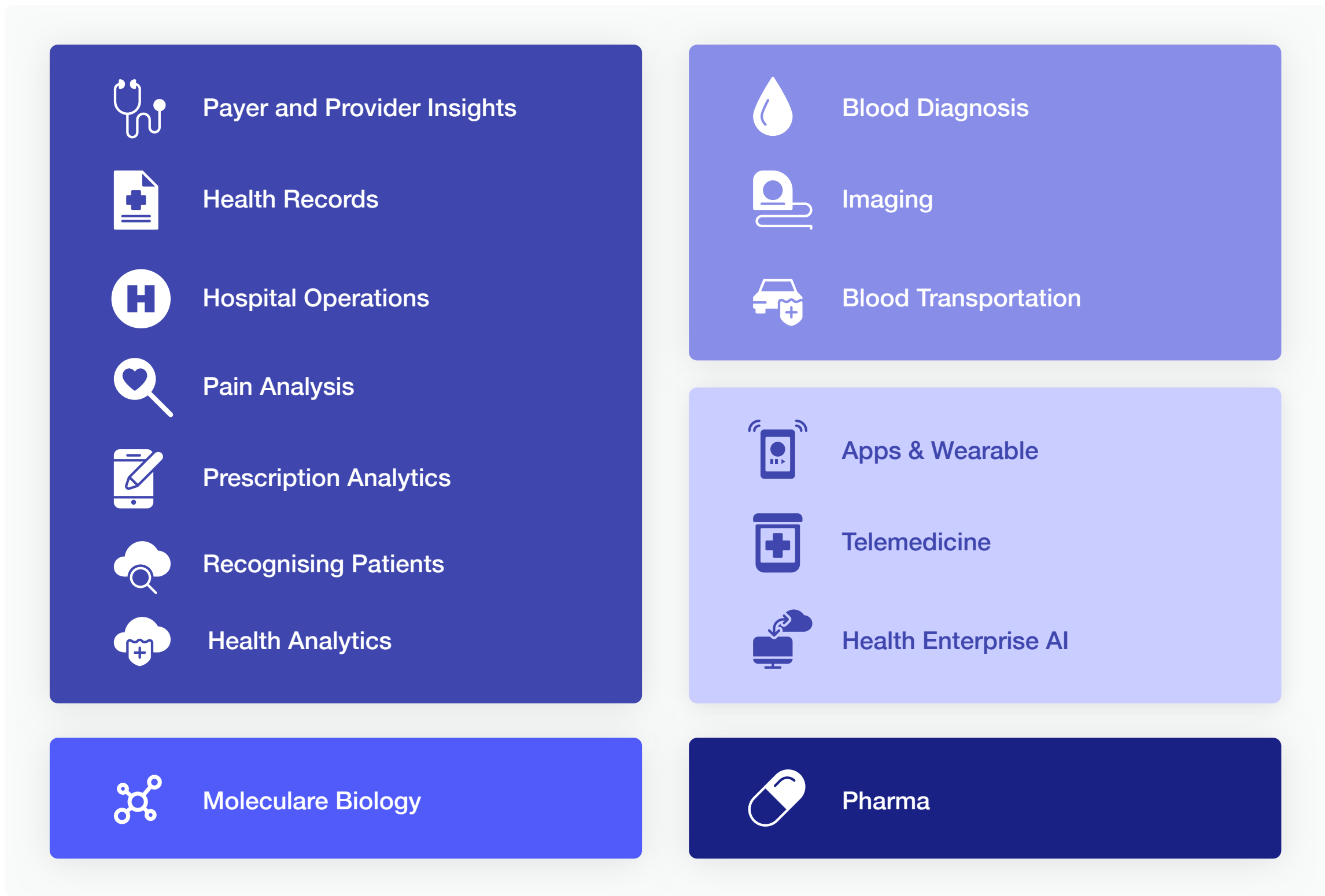
The mobile health (m-health) services market, which includes wellness, prevention, diagnostic and monitoring services, is expected to be worth £27 billion by 2020, growing at an average annual rate of 31% from 2014. The global m-health devices market will grow at an average annual rate of 37% from 2014 to become a £8.5 billion global market in 2020. Source: Connected healthcare market set to be worth £37bn by 2020 Source: <http://www.information-age.com/connected-healthcare-market-set>.

## Blockchain and AI disruption of healthcare

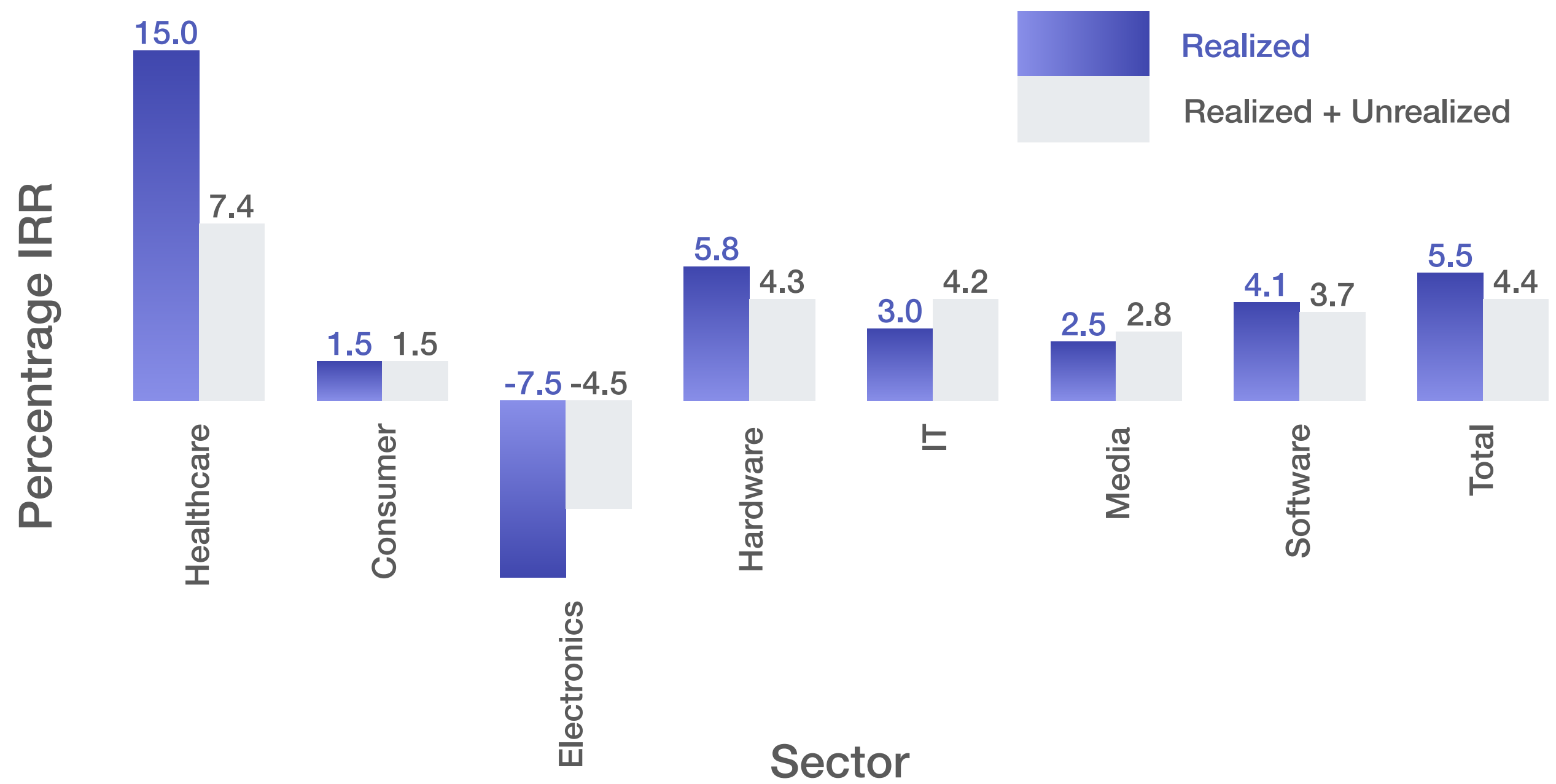


Lifesci PaaS holistic approach to map the ecosystem and create data and insights solutions with powered machine learning and human curators





life sciences and the delivery of modern health care depends on both private and public groups of trained professionals and paraprofessionals coming together as interdisciplinary teams. These teams are increasingly dependent on data insights and looking at fast forwarding developments in research and innovation. This includes a growing industry that comprehends professionals in medicine, psychology, physiotherapy, nursing, dentistry, midwifery and allied health, plus many others such as public health practitioners, community health workers, and assistive personnel.



Source [http://pages.stern.nyu.edu/~adamodar/New\\_Home\\_Page/datacurrent.html](http://pages.stern.nyu.edu/~adamodar/New_Home_Page/datacurrent.html)

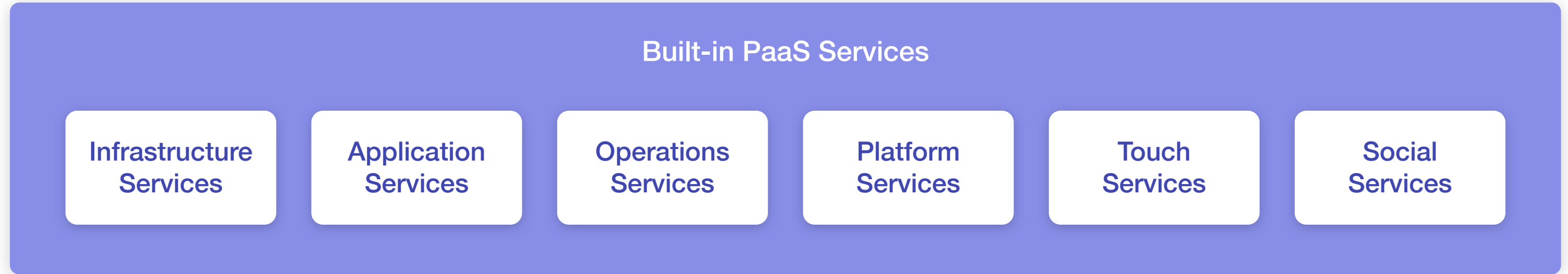
This community is increasingly dependent on technology, data, and rightful insights to systematically provide the best personal and population-based preventive, curative and rehabilitative care services. And on the top of this, there is an entire ecosystem of industry suppliers, drug providers, investors, that bring solutions based on that same data and information.

These professionals need increasingly coordinated data that can reach different levels and be secure and circulating between different sources. At the moment there is a lack of holistic platforms that can build the bridges between all the referred data, information and insights. This is a big problem for the whole industry. The lifesci proprietary IP PaaS will offer unique B2B tools, a search engine with data visualisation and services while at the same time it offers a digital network of partners and token holders who will have the opportunity to access a data-driven distributed ledger platform. Here it is intended that one will be able to find, research and participate in the seed-funding round of selected companies making some of the most innovative new drugs and medical devices and breakthroughs.

While Biotech and Life Science research, developments and investing are high risks, data shows (EY Biotechnology Report 2017 Staying the course Beyond borders) Source <http://www.ey.com/Publication/vwLUAssets/ey-biotechnology-report-2> that early information for professionals and investors in this sector can improve present healthcare issues while offering funding solutions that have outperformed Tech venture investing over the past decade (sources: Why Innovation in Health Care Is So Hard and Digital health is dead, says this health-tech investor) (source <https://hbr.org/2006/05/why-innovation-in-health-care-is-so-hard>). The reason why LSCI intends to be listed on multiple crypto-currency exchanges is it gives investors access to potential investors in different countries around the world.

lifesci aims to create a transparent network and market for those who historically have been unable to access the exciting opportunities in Biotech and Life science companies. By participating via lifesci platform it is intended one will be able to get a more comprehensive understanding and direct access to a variety of emerging life science and Biotech data and Companies. The lifesci platform is intended to offer dashboards with screens, search, and conducts scientific and financial due diligence on target data, trends, patents, patterns, and companies. For successful research and insight, lifesci will open ways to negotiate partnerships and in some cases a favourable opportunity for creating conditions for equity investment or in some cases it may seek to connect partners in order to have a percentage of the license revenue for a particular product or medical device.

As a condition of any lifesci participation, introduction or investment, the Biotech company (Bx) agrees to accept equity investment in the network, this will create ongoing demand for the lifesci crypto-currency platform services and digital network. Existing lifesci partners will then have the option to research, get insights and eventually invest alongside the lifesci network within a prescribed period. The lifesci focus will be on human health – generating new ideas that have the potential to improve the lives of millions and deliver better medicines to patients faster in currently overlooked areas such as orphan diseases and rare cancers.



The different sources of revenue will be as follow:

- LSCI utility token;
- Platform and APP subscription;
- Platform as a Service;
- Data as a Service API;
- Augmented Economy Empowered by AI (IoT, AI, ValueWeb) - registry trials;
- Data partnerships;
- Institutional partnerships and deals;
- Think tank consortium with international organisations, companies, and institutions.

Profit Generation Sources:

- Fees for access to the app and platform from the 3d parties (MedTech services and Investment and Financial organisations);
- Participation of % of shares of Healthcare / MedTech startups which will rise from the Research and participation in their profits;
- Creation of Augmented Economy elements for 3d parties in the Ecosystem and participation in the additionally added profits;
- Research, relevance and insights as service;
- Events / (conferences) and related specific projects.





# lifesci Committees

lifesci is intending to create an advanced Platform but also and foremost a platform of people and partners. lifesci is looking working with leading professionals and scientists who are driving global innovation and fostering solutions for global health needs.

lifesci various committees comprise experts, academics, technologists, investors, and regulators in the following areas:

## **Scientific Committee**

- Scientists, Nobel Prize winners, Academics;
- Drug development specialists;
- Biological Technology assessment experts;
- Medicine experts and research specialists holding PHDs;
- Life science and healthcare entrepreneurs;

## **Financial, ethical and Regulatory Committee**

- Fund management experience looking after unquoted and quoted startups and new patents;
- Venture capitalists to lend advice as to the optimum way to structure deals;
- Regulatory leaders and compliance experts in Biotech and life science transactions;

## **Technology, crypto, AI, blockchain and big data Governance Committee**

- Crypto economics - tokens, and ICO experts with a proven track record;
- Blockchain leading architects and developers;
- Big data and mining specialists and researchers;
- AI and deep learning leading academics and specialists;

Through their network and track-record in the Biotech, life science and healthcare industry these committees have access to a significant deal flow of big data, new innovation and research involving life science and Biotechnology and companies.

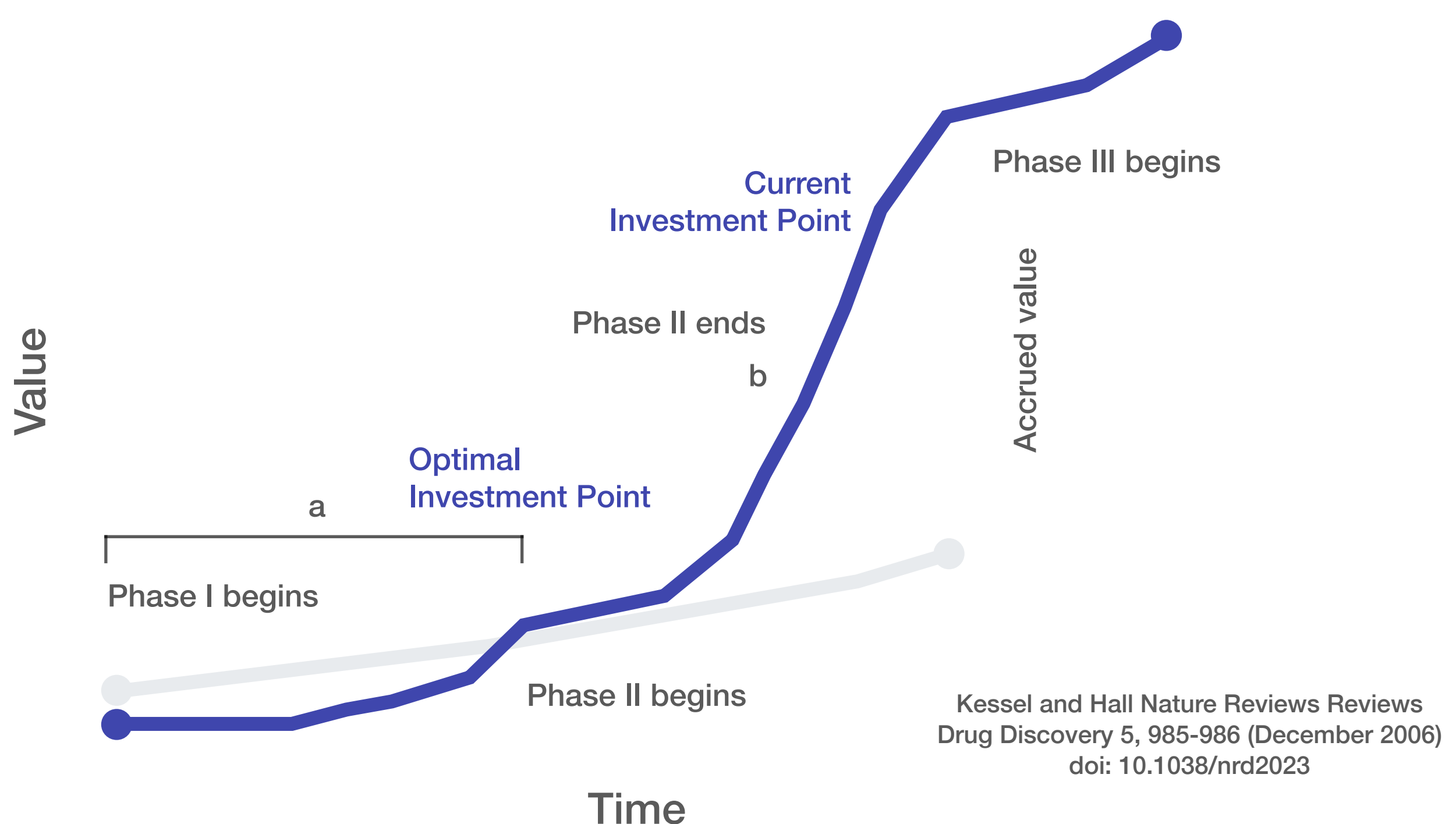
# lifesci Roadmap

lifesci will build its cutting-edge PaaS Blockchain healthcare (big) data solution (at this date an MVP that was already prepared with a trademark product) while creating and nurturing a powerful digital network of professionals, influencers, organisations, and investors. The pipeline established to set a solid foundation of scientific, academic and professionals digital database and a smart contract drove regime of agreements and contracts for setting the best possible intelligence, data, and insights.

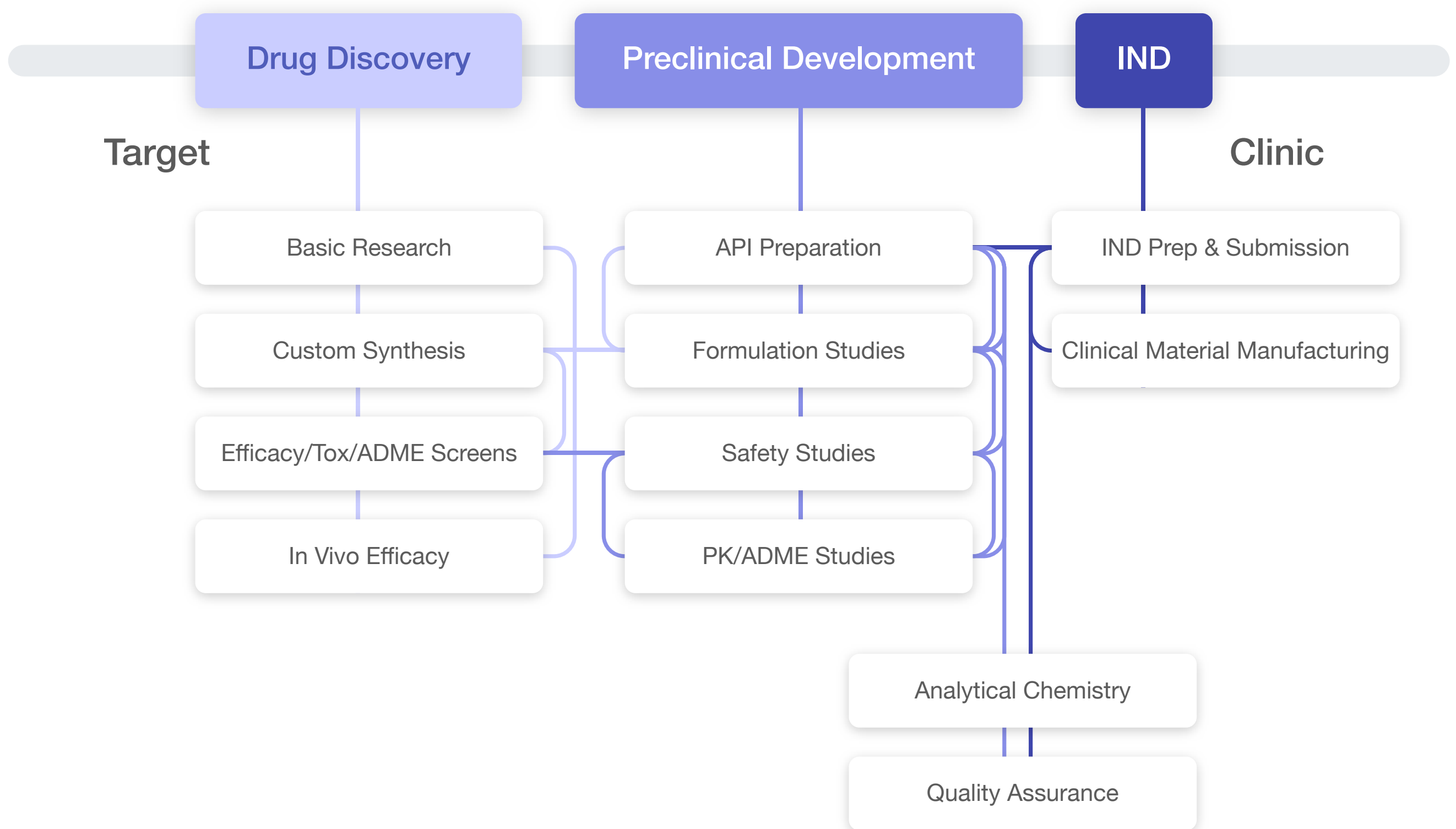
In the last years, there has been a growing interest for Big Data in the life sciences field. International companies such as Apple or Alphabet are entering the market and heavily investing in healthcare startups. Through the GV venture capital arm, Alphabet recently took an equity stake in companies developing life-saving therapies. Genomics, biotechnologies or digital health are the main areas big corporations are investing in. As Tim Cook stated in a 2017 keynote that “health care is big for the future of Apple”, the company started to explore and announce ways in which it can use existing smartphones and wearables to collect patient information.

lifesci will look to attract the best talent and material for the platform and at the same time highlight eventual solutions for 3-5 unique Biotech, Healthcare and Life Science investments opportunities per year.

The planned exit for each investment will be within 18 to 36 months of making an investment and it is intended that it is linked to a concrete scientific, regulatory or a clinical milestone. If successful at this milestone there is typically a significant inflection point in valuation:



lifesci will focus on early drug and medical device discovery, preclinical development, Investigational New Drug (IND) preparation and IND submission as below:



This focus reduces the time, cost and unpredictability of the drug and device development process for lifesci and enables it to rapidly build, implement and exit a portfolio of Biotech, healthcare, and life science investments. The potential organisations that lifesci wish to invest in will typically be made during drug and device discoveries and invention with an exit after successful IND filings.

Typically each successful IND may be valued at ~\$5M-20M and will require ~\$1M of investment. INDs are sold on to VCs or to large Pharma companies. Successfully completing pre-clinical development to IND is risky, technically difficult and scientifically challenging. Furthermore, they have successfully converted this scientific success into returns for early life science investors.



# Blockchain Applications in Health

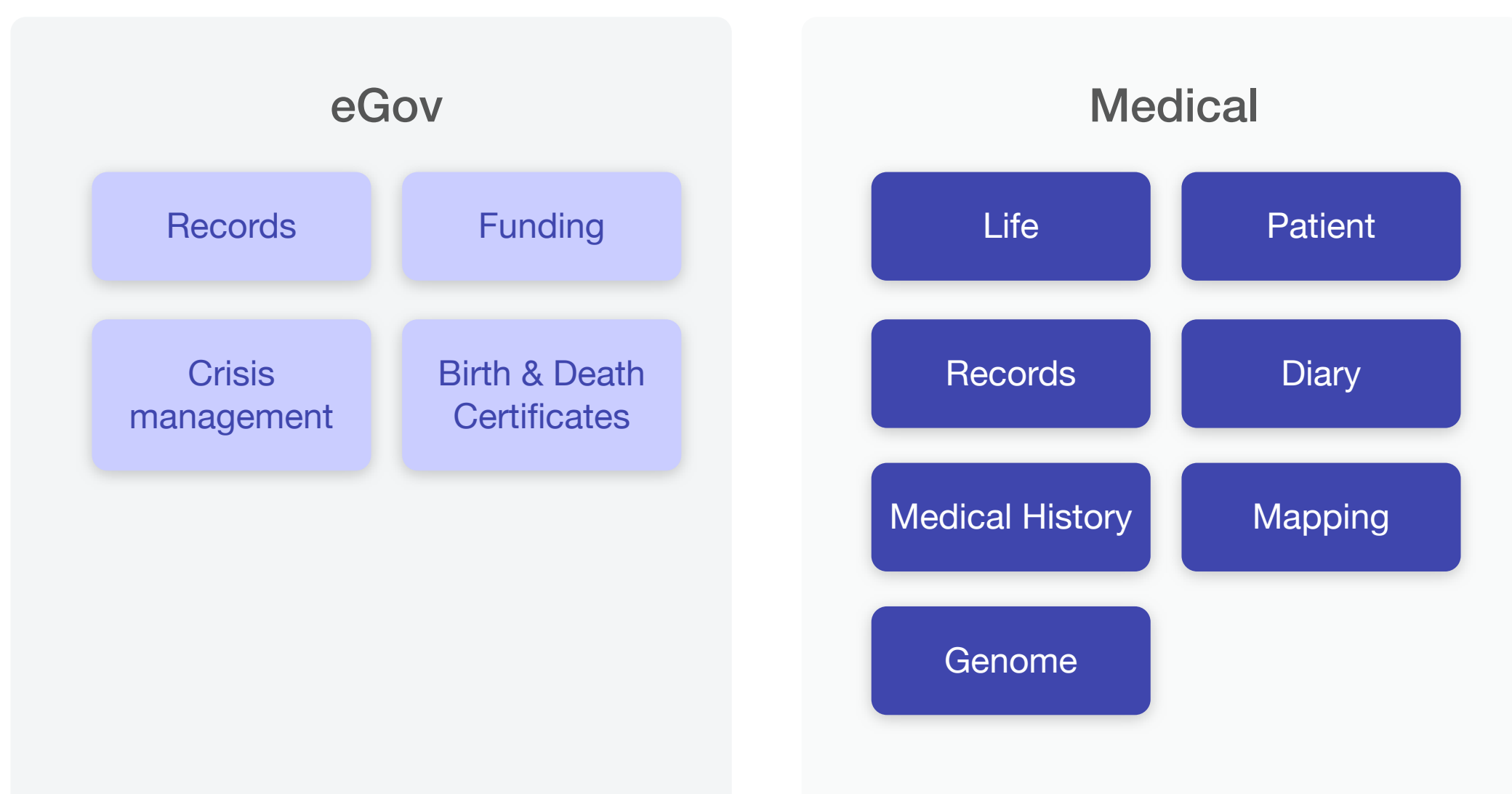
The (r)evolution of the healthcare system will allow the patient to take back their role at the center of the healthcare circuit. Medicine will become more and more patient-centered. Thus, medical data will become essential in order to adapt the care and the treatments to each patient.

Blockchain technology has the potential to solve some important problems in healthcare such as interoperability and data security. It also allows patients to gain more control over their data and decide when and whom to share it with through smart contracts.

There is no doubt that Blockchain and AI technologies are disrupting and creating new solutions. By 2025, Blockchain, IoT, Machine Learning Will Converge in Healthcare (sources <https://healthitanalytics.com/news/by-2025-blockchain-iot-machine-learning-will-converge-in-healthcare>, decentralised models and applications for the general healthcare ecosystems. As they become scalable they will start to power the whole health information and data systems worldwide. Applications and new platforms promise to significantly assist to unlock the true value of interoperability and create better governance and solutions for the Biotech, life science and healthcare industries.

Blockchain-based systems have the potential to reduce or eliminate the friction and costs of current intermediaries. Specific examples include Precision Medicine or Patient Care and Outcomes Research (PCOR) (research source <http://www.rethinkingclinicaltrials.org/tag/patient-centered-outcomes-research-2/>), and Nationwide or International Interoperability Roadmaps. Improved data integrity, decentralisation and disintermediation of trust, and reduced transaction costs will underpin this.

## HEALTHCARE ECOSYSTEM



Source: lifesci PaaS solution among life science and healthcare sources

	HIE pain points	Blockchain opportunities
Network issues	Establishing a trust network depends on the HIE as an intermediary to establish point-to-point sharing and “book-keeping” of what data was exchanged.	Disintermidation of trust likely would not require an HIE operation because all participants would have access to the distributed ledger to maintain a secure exchange without complex brokered trust.
Cost issues	Cost per transaction, given low transaction volumes, reduces the business case for central systems or new edge networks for participating groups.	Reduced transaction costs due to disintermediation, as well as near-real time processing, would make the system more efficient.
Big Data input quality issues	Master Patient Index (MPI) challenges arise from the need to synchronise multiple patient identifiers between systems while securing patient privacy.	Distributed framework for patient digital identities, which uses private and public identifiers secured through cryptography, creates a singular, more secure method of protecting patient identity.
Big Data standards issues	Varying data standards reduce interoperability because records are not compatible between systems.	Shared data enables near real-time updates across the network to all parties.
Big Data access issues	Limited access to population health data, as HIE is one of the few sources of integrated records.	Distributed, secure access to a patient longitudinal health data across the distributed ledger.
Big Data and protecting patient privacy	Inconsistent rules and permissions inhibit the right health organization from accessing the right patient data at the right time.	Smart contracts create a consistent, rule-based method for accessing patient data that can be permissioned to selected health organisations.

# Why is Blockchain an Enabler of Interoperability?

One of the main concerns when it comes to patients' personal and medical data is how it is going to be used and the way medical professionals and organisations will have access to it. Up until now, patients were very cautious when sharing their data especially because of the boom of connected devices and the blurry information regarding the way said data was going to be used. Mentalities are slowly starting to change when it comes to the perception of using health (data source <https://www.ncbi.nlm.nih.gov/books/NBK61963/> ).

Patients are becoming more and more aware that their daily activities can now be tracked and that the data they produce is very valuable (research source [https://dma.org.uk/uploads/ckeditor/Data-privacy-2015-what-consumers-really-thinks\\_final.pdf](https://dma.org.uk/uploads/ckeditor/Data-privacy-2015-what-consumers-really-thinks_final.pdf) ). Moreover, when asked if they would share such information with the medical and the scientific communities, the majority are favourable. Furthermore, patients are more likely to share personal information if they consider that it is useful either to them or to an ethic cause (e.g. scientific research) and especially they can control which information is being shared.

Despite this statement, today, patients often only have the choice to divulge their whole medical record or none of it. Patients cannot pick which information they want to share and on which conditions. The current data management architectures do not allow it.

In addition to the previous remarks, there is still often a significant gap between a patient agreeing to share his/her data and the medical community actually having access and using the information. Often, when a patient arrives at the emergency room, the doctors may not have any previous medical records and they are forced to run tests to find out basic information, such as the blood type or allergies.

This process is expensive, time-consuming and delays the care. This problem is mainly caused by medical records being often held on different localised databases which are not interlinked (research source <https://www.ncbi.nlm.nih.gov/books/NBK236556/> ). Therefore it makes it very hard to use data on a large scale and drive interoperability among the scientific and medical communities.

The blockchain is designed to allow a large number of parties to interact within a secure network and track said interactions on a decentralised ledger. This decentralised system makes data sharing more effective on a large scale, therefore removing the boundaries of traditional local databases. Moreover, as the ledger is ruled by code and algorithms, trust in the authenticity of the information is not an issue anymore. Finally, information on the Blockchain is encrypted and digitally signed, proving ownership but, at the same time, making it impossible to identify the owner without its authorisation.



Healthcare providers track and update a patient’s common clinical data-set each time a medical service is provided. Traditionally, this information is tracked in a database within a singular organisation or within a defined network of healthcare stakeholders. This flow of information, originating from the patient through the healthcare organisation each time a service is performed, does not need to stop at the individual organisational level. Instead, healthcare organisations could direct a standardised set of information, present in each patient interaction, to a nationwide Blockchain transaction layer.



The surface information on this transaction layer would contain information that is not Protected Health Information (PHI) or Personally Identifiable Information (PII); rather, select and non-personally identifiable demographics and services rendered. Information could enable healthcare organisations and research institutions access to an expansive and data-rich information set, whilst maintaining patient confidentiality.

Information stored on the Blockchain could be universally available to a specific individual through the Blockchain private key mechanisms, enabling patients to grant permission to share their information with healthcare organisations much more seamlessly. This deployment of a transaction layer on the Blockchain could revolutionise interoperability goals while creating a trust-less and collaborative ecosystem of information sharing, to enable new insights to improve the efficiency of a nation’s health care system and health of its citizens.

# How will Blockchain Help?

The goal of Blockchain technologies is to reduce intermediaries and third parties in order to bring more interoperability, privacy, and security. It allows individuals as well as companies and governments to exchange assets and store records of immutable, timestamped and trustworthy transaction. However, it cannot be a substitute for a database. Indeed, it is not suited for large data volumes and instantaneous access to such data. It is made to keep track of transactional data that is designed to be shared among a network of parties while promoting collaboration.

Hence, blockchain can leverage the storage of two types of data:

- On Chain Data that is stored on the blockchain;  
Example: Age, Gender, Doctor's Name, Healthcare Institution, Link to the database that contains the actual information, etc.
- Off Chain Data that is stored in traditional databases or in cloud computing systems and whose location is on the blockchain;  
Example: MRIs, Lab reports, Genome, etc.

The data located in traditional databases can only be accessed provided the user has the private key or requires permission. Once the access is granted, a link automatically redirects the user to the location containing the information. The Blockchain would work as a register in which one cannot find the information itself but where one can find the location of the data. Thus, the Blockchain would contain a timestamped link to the location and any additional information that could help determine the nature of the information it is linked to.

This will be most effective when a specific set of standardised data is stored directly on the Blockchain for immediate, permission access, supplemented by off-chain data links when necessary. A standardised data set could include information such as demographics (gender, date of birth, other data), medical history (immunisations, procedures), and services rendered (vital signs, services performed, and other data). As the field matures, further evaluation and guidance will be needed to determine where and how each data type should be stored.

Once a standardised set of healthcare information is established, the specific data fields can be created in a smart contract to employ rules for processing and storing information on the Blockchain, as well as stipulating required approvals prior to Blockchain storage. Each time a patient interaction occurs, healthcare professionals will pass information to the smart contract — where the parameters of the contract will verify that valid information has been submitted. As an example, the smart contract can stipulate that all fields need to be provided prior to Blockchain storage or that a specific field must contain a particular data type (e.g. numerical) to be valid. Once the smart contract validates that the correct data fields have been submitted, it will direct the transaction to the Blockchain for storage.

On-chain data

Off-chain data

Data types	Standardised data fields containing summary information in text form (e.g. age, gender)	Expansive medical details (e.g. notes) and abstract data types (e.g. MRI images, human genome)
Pros	Data is immediately visible and ingestible to all connected organisations, making blockchain the single source of truth.	Storage of any format and size of data
Cons	Constrained in the type and size of data that can be stored	Data is not immediately visible or ingestible, requiring access to each health care organisation’s source system for each record. Requires off-chain micro-services and additional integration layers.

Recording data on the Blockchain has the potential to address interoperability issues in two different ways:

First, identifiable patient data could be accessed under defined conditions anywhere in the world in order to improve precision medicine. Lack of access to complete medical records could be prevented by using a Blockchain-based national- or worldwide network that keeps track of the location of each data, allowing the medical professionals to access it from anywhere in the world.

On another note, the development of precision medicine goes hand in hand with the development of therapies based on the analysis of the human genome (research <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5001238/>). The human genome contains precise information such as the diseases a patient is susceptible to develop or how likely he is to respond to a treatment. As the understanding of the genome is increasing, having access to this information can substantially change the way patients are treated.

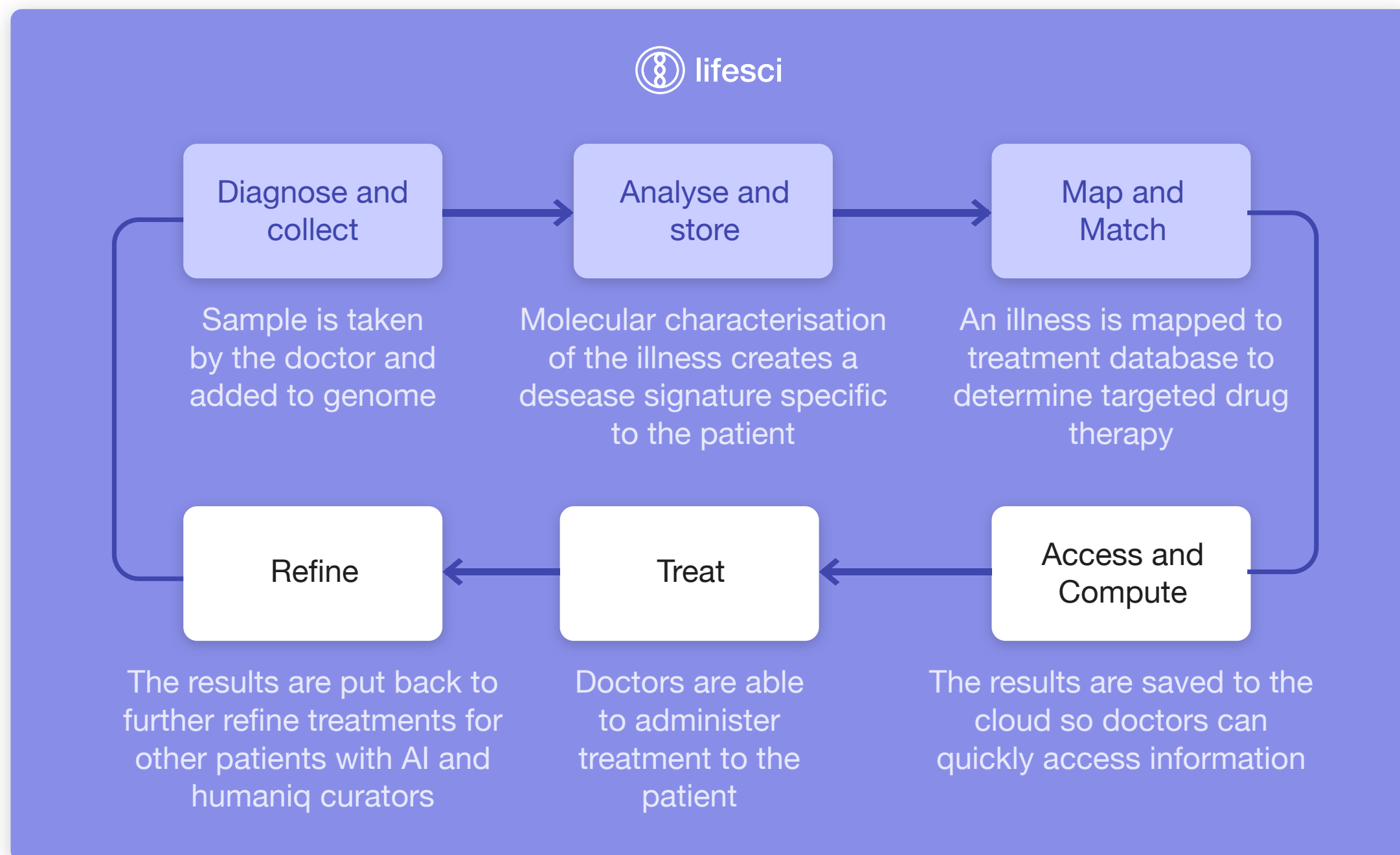
Second, anonymised data selected by the patient could be accessed by health professionals or researchers anywhere in the world and could contribute to improving research (sources info <https://wellcome.ac.uk/what-we-do/our-work/our-policy-work-using-patient-data-research>). Sharing information among the medical and scientific communities is a major challenge. Still today, doctors use social networks (<https://bmcmmedinformdecismak.biomedcentral.com/articles/10.1186/s12911-016-0327-y> ) to communicate and share patient data. This type of information is supposed to go through secure networks when disclosed to protect the patient’s privacy. Moreover, data sharing is limited to the immediate environment of the healthcare professional and can hardly be accessed worldwide.



In developed countries, researchers usually have access to the latest technologies, which, on one hand, empowers scientific breakthroughs but on the other hand creates disparities between industrialised and developing countries. With information gathered from centres all around the world, researchers could predict and analyse which patients will respond best to a particular treatment. By looking into their medical history, their disease or their genome, researchers could develop more and more targeted therapies and personalised drugs. Blockchain can provide healthcare stakeholders with a secure structure for data sharing.

# Blockchain Architecture

When it comes to Blockchain architecture one can think of consensus as for the first layer of a decentralised technology architecture. This consensus is the basis for the underlying protocol that governs any Blockchain operation. The Blockchain (and related Blockchain operations and services) need that bridge. A Blockchain is, therefore, the technology convergence where it can store any data semi-publicly in a linear container space (the block).



During the initial stages of the Blockchain architecture for the lifesci platform, we have determined that in order to implement the best solution, we have to monitor, explore and research all current best practices and solutions.

ICOs while creating tokens have created new solutions for business funding, using these new value forms as services to gather participation from different industry players, organisations and individuals. This creates a model of technology and funding/finance that is fast-growing, opening up new challenges and opportunities.

Cryptocurrencies have raised over \$3 Billion so far in 2017 covering over 25 different business sectors (source <https://www.coinschedule.com/stats.php> ). There are over 1,100 Blockchain cryptocurrencies with smart contract technological solutions available (source <https://seekingalpha.com/article/4110938-bitcoin-killing-gold> ). When we relate this to different business models, ICO funding creates a different economy of scale that has to collaborate with traditional and legacy systems.

These new tokens and business models are being applied to the complex business model of health, opening up regulatory and compliance concerns which can be classified according to their architecture of the chain of blocks. There are 2 types of distributed ledger architecture: Account-based and Unspent Transaction Outputs (UTXO).

The Proof of Work consensus algorithm and its underlying peer-to-peer protocol secure the state-machines' state and transitioning logic from tampering, and also share this information with all nodes participating in the system. Nodes can, therefore, query the state-machines at any time and obtain a result which is accepted by the entire network with high certainty.

We utilize Ethereum's smart contracts to create intelligent representations of existing medical records that are stored within individual nodes on the network. We construct the contracts to contain metadata about the record ownership, permissions and data integrity. The blockchain transactions in our system carry cryptographically signed instructions to manage these properties. The contract's state - transition functions carry out policies, enforcing data alternation only by legitimate transactions. Such policies can be designed to implement any set of rules which govern a particular medical record, as long as it can be represented computationally. For example, a policy may enforce that separate transactions representing consent are sent from both patients and care providers, before granting viewing permissions to a third party.

## System Node Description

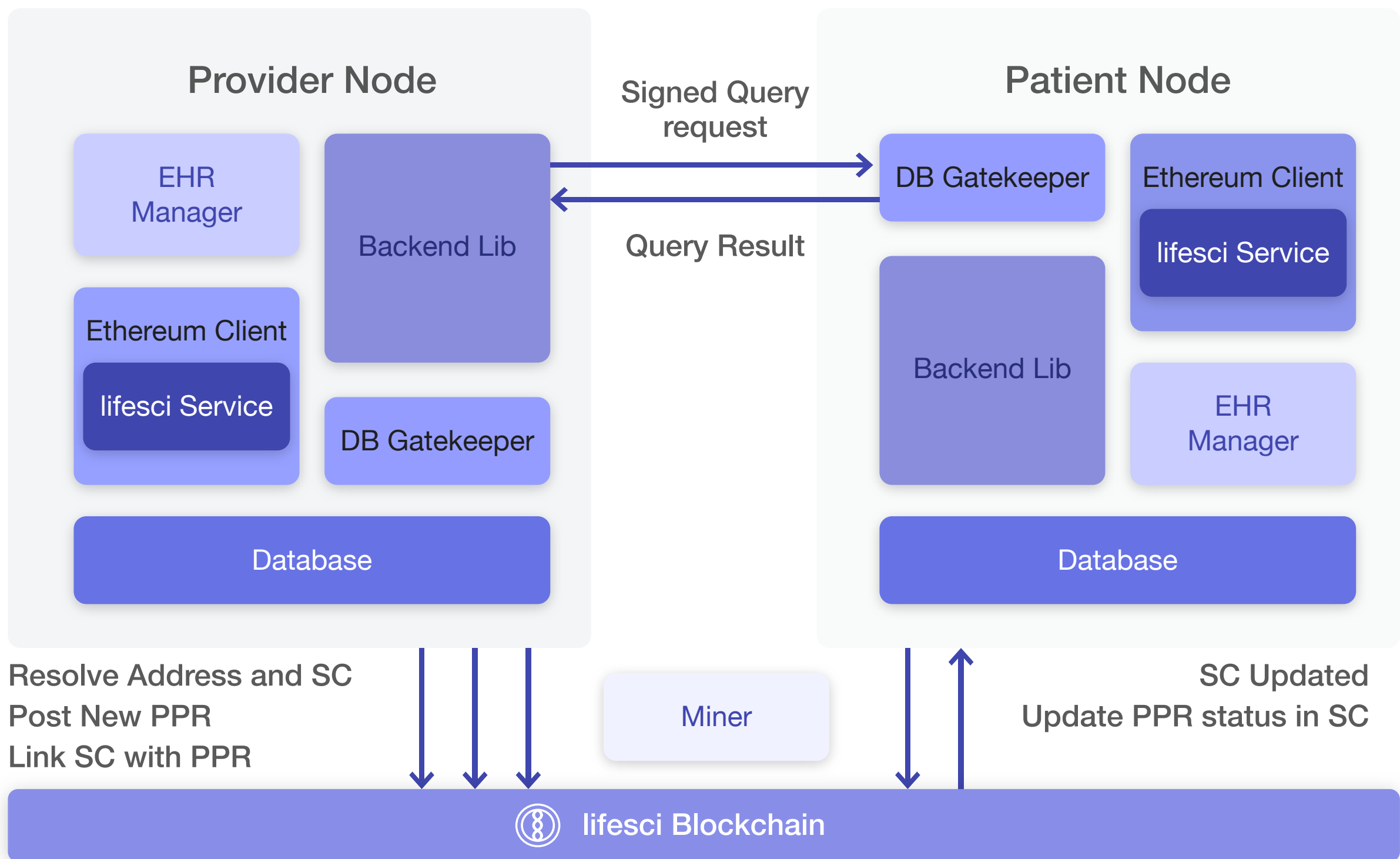
This transaction-based state-machine generalisation of the Blockchain is informally referred to as smart contracts. Ethereum is one of the larger organisations that has tried to attempt a full implementation of this idea.

lifesci intention design will design the components of a superlative healthcare blockchain data-driven system nodes to integrate with existing EHR infrastructure. We assume that many nodes, and in particular care providers, already trustfully manage databases with patient data stored on servers with network connectivity. Our design introduces four software components: Backend Library, Ethereum Client, Database Gatekeeper and EHR Manager.

These can be executed on servers, combining to create a coherent, distributed system. We provide a prototype implementation of these components that integrate with a SQL-type database and is managed through our web user interface. Notably, any provider backend and user interface implementations can participate in the system by employing the modular interoperability protocol as defined through our Blockchain contracts.

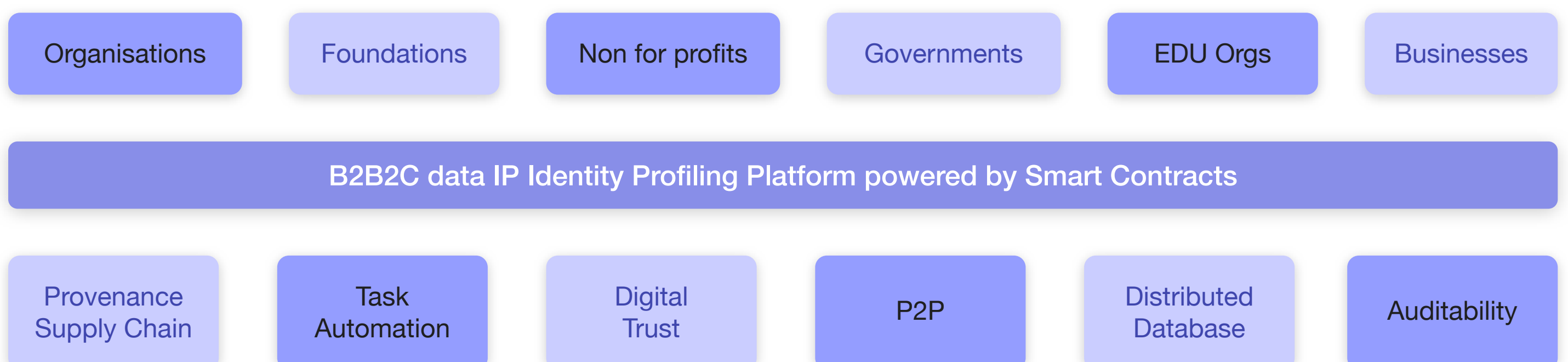
Patient nodes in our system will contain the same basic components as providers. An implementation of these can be executed on a local PC or even a mobile phone. Their local database can be one of many lightweight database implementations.





The databases can function merely as cache storage of the patient's medical data. Missing data can be retrieved from the network at any time by following the node's Summary Contract.

lifesci will aim to offer different participants an immutable log of their medical history, which is not only comprehensive but also accessible and credible. This restores patient confidence, as participants are now more fully informed of their medical history and any modifications to it. Through permission management on the Blockchain, it is intended that the platform will allow different types of industry, research and patient-vetted data exchange between medical jurisdictions, governments, academic players and an interoperable content management system for medical professionals supervising these records. The Blockchain ledger keeps an auditable history of medical interactions between patients and providers, likely relevant for regulators and payers (e.g. insurance) in the future. (related research can be found in this white paper [https://www.healthit.gov/sites/default/files/5-56-onc\\_blockchainchallenge\\_mitwhitepaper.pdf](https://www.healthit.gov/sites/default/files/5-56-onc_blockchainchallenge_mitwhitepaper.pdf))



# lifesci Mechanism

Since 2007 USA's drugs regulator has required that all clinical trials are registered in ClinicalTrials.gov, a publicly accessible database. There are various organisations like this one around the world. The challenge is that this data is centralised and has no capacity to connect with other databases.

lifesci wants to build a connected, secure and decentralised solution to build a global data and intelligence platform. Of course, this requires an efficient technological and ethical system working together. A platform that offers a technological solution that creates a natural or established process by which something takes place or is brought about.

For individual token payments on a Blockchains, there is a need to scale the underlying Blockchain activity (which does not affect the underlying chain to reduce the computational pressure of validating/mining nodes). It is, therefore, necessary to conduct Lightning Network activities (or similar constructions using channels). However, Lightning Network faces significant pressure around network effects with capital, it's desirable to prevent liquidity pools from centralising to a single trusted entity. By using the same mechanisms of the decentralised clearinghouse, we can create a Lightning Network hub which is not owned by any single individual or tokens which support more complex smart contracts (e.g. Ethereum, ERC-20-like tokens, etc.).

The above mechanisms require significant volume of activity (with a large amount of data), and is not at this time suitable for all the activity to occur on the Ethereum main chain, however the construction would be to bond trading activity in the public Ethereum chain with contract execution input being provided by the LSCI chain (lifesci unique use of blockchain tech).

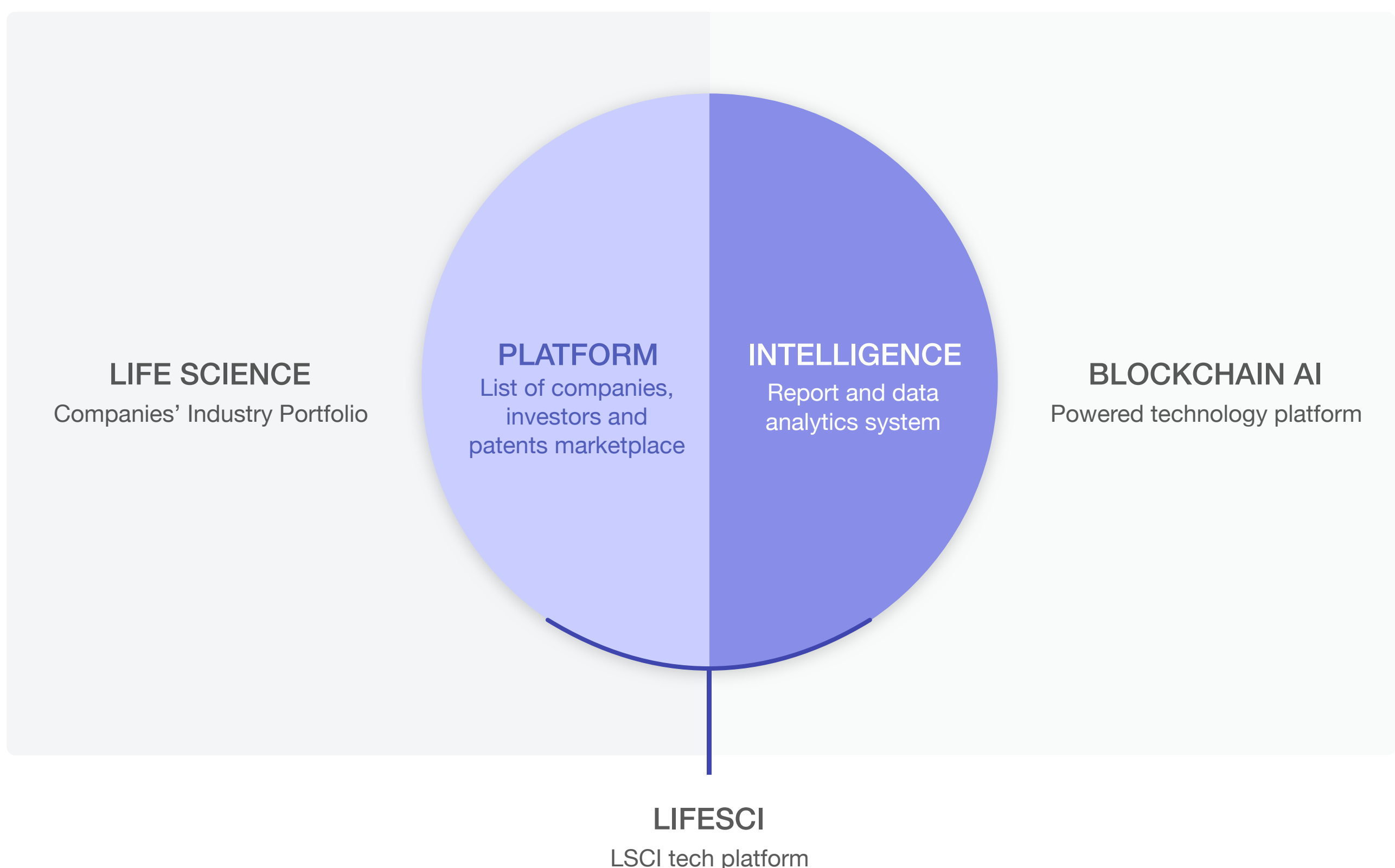
We are building a Blockchain which hooks into other Blockchains to allow for trading across token/asset classes, largely backed by Ether. From the perspective of an individual chain, we are building a scalable Blockchain whose contract state is bonded by the activities of the lifesci chain itself.

# lifesci Concept: Product and Token

Life sciences will be one of the main beneficiaries of Big Data. lifesci Blockchain and AI Platform as a Service will give access to new breakthrough life sciences data and offers insights into cutting-edge companies and innovative startups in these sectors.

Big Data is emerging as the basis for decisions, business logic, and health fundamentals. Blockchain and AI are the new foundational bridging technologies to understand this data, store it securely and create a relevance for it. Therefore, lifesci wants to make high-value health data accessible to healthcare stakeholder such as entrepreneurs, investors, researchers or medical communities in the hope of better health outcomes for all.

The healthcare ecosystem has a vast and multi-dimensional usage and creation of Big Data. The way forward is to make health and life sciences Big Data much more digestible and useful, enabling healthcare professionals and their organisations to dial into the specifics, manage conclusions and control its different sources of data, rather than consider the entire chaos of disconnected information that exists currently. lifesci will make sense of the information it aggregates, making it easier to find, more readable and ready to analyse and interpreted according to each stakeholder's needs. Furthermore, it empowers public and private sector innovators and entrepreneurs to make informed decisions based on reliable information.





lifesci intends to allow users to search, access and analyse information on a large scale while ensuring privacy and confidentiality. Through the use of cutting-edge technologies such as blockchain and AI, data is securely stored and accessed. lifesci’s goal is to connect the players of the industry, the ecosystem, and all their data thus building optimal opportunities to improve general and particular performance, look and share the voice of the players, their insights, correlate and create relevance.

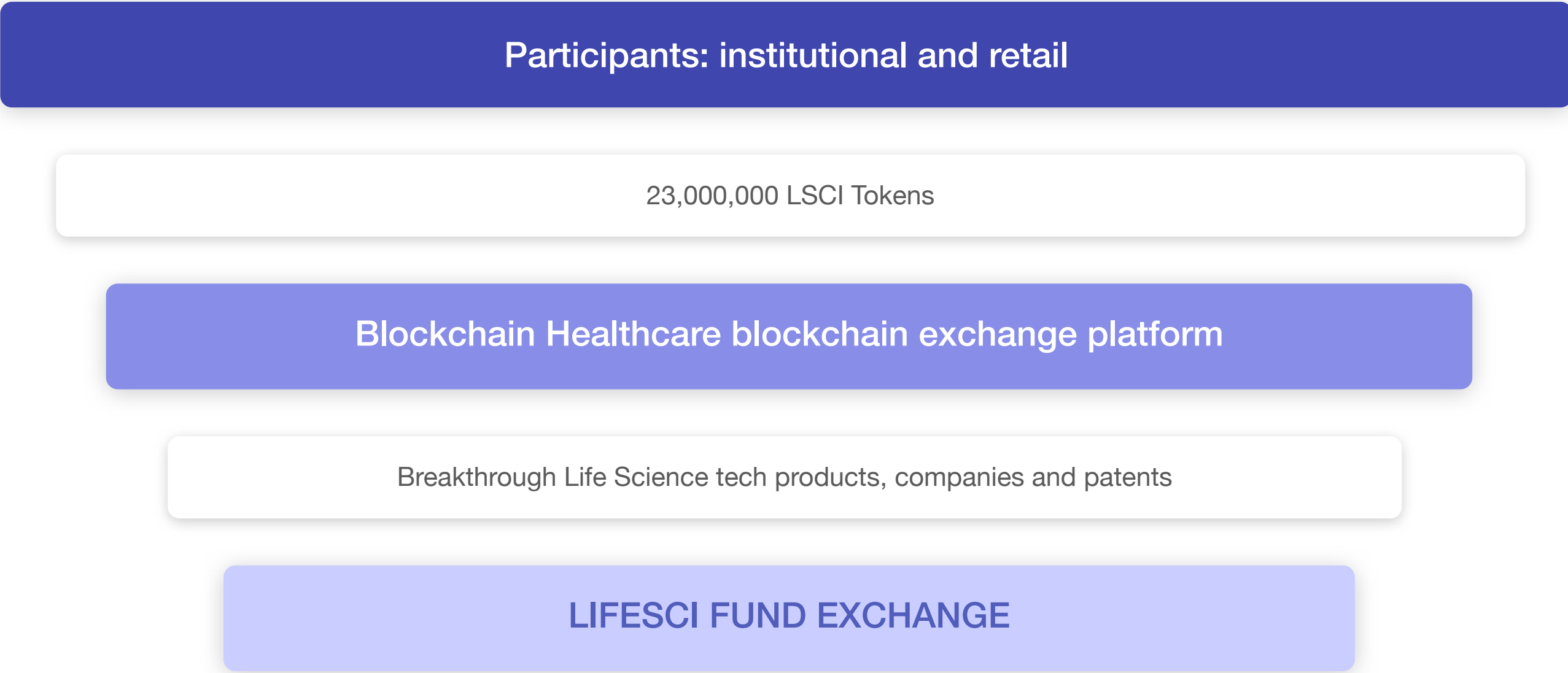
## Enabling a research and investment network

lifesci ambition is to create an exclusive portfolio of research in multiples areas of Biotech, healthcare and life science companies either as breakthrough solutions they offer or equity stakes or by acquiring a share of licensing revenue. The access to these companies will be given to the network of participants possessing the Token (LSCI).

## The Intelligence Platform

The lifesci Platform is being built to offer online regular updates using the power and security of Blockchain technology. It will also offer a search engine, data visualisation as well as data relevancy capacity. The Intelligence platform will feature exclusive content about the healthcare industry as well as interviews (lifesci Healthcare Labz) with Biotech, healthcare, Life Science and technology thought leaders.

The lifesci Healthcare Labz will be a content and search engine containing media insights, infographics, interviews and profiles that aim to showcase the great people, organisations, emerging startups and trends that contribute, each in their fields, to transform the healthcare industry. The objective is not just to describe a project or a speaker’s story but rather to bring thought-provoking ideas to those that have access.



# A Blockchain Powered Platform

The lifesci ecosystem will use cutting-edge technologies to ensure security and transparency. Hence, Blockchain and the crypto-economy are at the heart of the lifesci platform project. lifesci uses Data Visualization, Natural Language Processing, SaaS, Text Analytics, Analytics, Software, Big Data based on blockchain AI technology.

lifesci platform searches analyzes and visualizes the healthcare's life science collective intelligence to help answer strategic questions. It draws connections between big problems, big data, big ideas, giving brain more power than you ever dreamed possible.

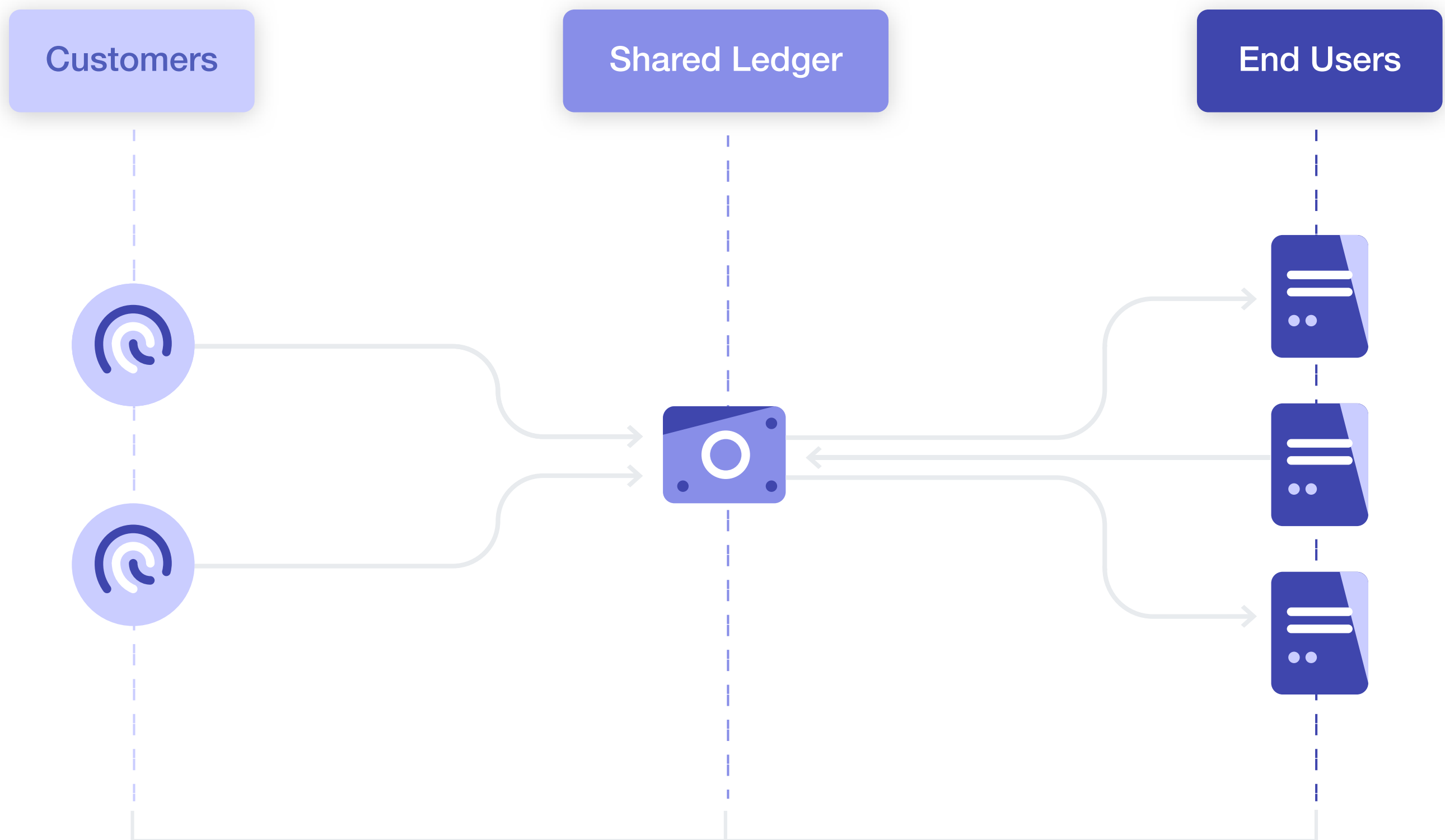
The company's goal is to allow non-technical users in enterprise organizations to independently access the world

The PaaS project will use an Advanced Digital Ledger Technology dashboard and network to define solutions and analyse trends and big data to better map the life science present challenges and how to leverage effective and efficient ways and solutions to the biggest problems, healthcare, biogenetic issues. The platform will incorporate set of digital tools solutions that integrates Life Science macro areas, patents, Researchers, BioPharma Companies, Medical Device Manufacturers, Retailers and Healthcare Providers. The objective is to try and improve patient outcomes while connecting and creating a database that can be used to enable investors to find best means of solving the biggest problems or dealing with the maintenance or improvement of healthcare's multiple challenges. By taking a more holistic view of data it is aiming to try and help in the prevention, diagnosis, treatment of disease, illness, injury, and other physical and mental impairments in human beings while at the same time visualising and find the best organisation, startups, and investment opportunities.

lifesci platform is dedicated to supporting innovative emerging startups and organisations throughout the research, insights and drug development full lifecycle. By developing cutting-edge Blockchain and AI solutions that help align company initiatives with strategic partners, we will help both researchers, professionals, startups organisations achieve their corporate goals and expand their enterprise.

When the patient is conscious: the combination of the patient's and the provider's private keys unlock the access to the data.

If the patient isn't conscious: one or more third parties, previously picked by the patient (ie someone with a medical power of attorney), need to give their permission before the healthcare provider accesses the data.



User agrees to share health data. Health wallet creates pseudonymous address and stores as smart contract on Blockchain. Gives permission for certain release under specific conditions.

Researchers wish to access data. For each record, they check conditions of smart contract to determine if the use is allowed. If so, then access the data, record the transaction on Blockchain, make micropayment to individual's health wallet.

Either way, the patient has full control over their medical information and can decide whom to share it with.

Furthermore, medical records are not the only source of data related to a patient. Indeed, as the Internet of Things (IoT) develops, wearables become an important source of information. This type of data could be used in the patient's interest to track his activity, set goals and adapt treatments. All this can be done through smart contracts. Indeed, the patient and his GP can define the clauses of the contract and set objectives and consequences if the patient succeeds or fails to reach them.

The patient's wearables example how fitness wearables will send data to doctors <https://qz.com/467145/the-next-wave-of-fitness-wearables-will-send-data-directly-to-doctors/> record information and compare it to the clauses of the smart contracts in order to produce an action (reward or penalty). Moreover, the data is also sent to the GP, that can interact with the patient, see what were the main difficulties in reaching the objective, and therefore adopt the care.



# Blockchain in the Healthcare Industry

Within the lifesci community, the block content represents data ownership and viewership permissions shared by members of a private, peer-to-peer network. Blockchain technology supports the use of “Smart Contracts” which allows automation and tracking of transactions (e.g. change in viewership rights, or the birth of a new record in the system). Using smart contracts on the lifesci Blockchain portal, patients and providers can directly and confidentially share medical information with controllable permissions and data retrieval instructions (essentially data pointers) for execution on external databases.

lifesci intends to include on the Blockchain a cryptographic hash of the record to ensure against tampering, thus guaranteeing data integrity. Providers can add a new record associated with a particular patient, and patients can authorise sharing of records between providers. In both cases, the party receiving new information receives an automated notification and can verify the proposed record before accepting or rejecting the data. This keeps participants informed and engaged in the evolution of their records.

lifesci wishes to prioritise usability by offering a designated contract which aggregates references to all of a user's patient-provider relationships, thus providing a single point of reference to check for any updates to medical history. We handle identity confirmation via public key cryptography and employ a DNS-like implementation that maps an already existing and widely accepted form of ID (e.g. name, or social security number) to the person's Ethereum address. A syncing algorithm handles data exchange “off-chain” between a patient database and a provider database, after referencing the Blockchain to confirm permissions via our database authentication server.

## LSCI Tokens

One of the main uses of the token is to function as a value transfer system within the community. Within this value, detachment has contained the data on the transactions that redistributes the tokens. The ability to create our own assets and currencies based on blocking technology has aroused great interest in various industries, which led to a rapid growth in the number of new cryptocurrencies. But the creation and maintenance of a new detachment require sufficient qualification, as well as resources to ensure the proper level of security of the system. In this regard, the idea to use the existing, protected and operating public blockade in order to realise the possibility of issuing digital assets.

Subsequently, separate Blockchains appeared, the main purpose of which was to create platforms for the emission and circulation of user tokens. At the end of 2013, the Nxt platform was launched, which supported the issue of its own user tokens.

In 2015, the Ethereum Blockchain was launched, the main idea of which is to create a universal solution in contrast to Bitcoin, which uses the Turing full language of scripts and the ability to create Smart contracts. To implement the task of creating user assets, a standardised smart ERC20 contract was developed that provides the functionality of issuing and transferring assets/tokens.

At the moment, various Blockchain platforms are already implemented and functioning, providing the ability to issue tokens based on their own public blockbust. There are many different types of tokens are released on all platforms. lifesci will work to scale this.

The lifesci token is a system of exchange that intends to facilitate a different exchange of data between the different players that will be using lifesci platform and its community ecosystem. The LSCI token will make possible transference of data and value for the purpose of its platform and community.

lifesci is a utility token that can be used to access the multiple lifesci products PaaS or data related services and control the ecosystem. The 23.000.000 tokens (the same number of the Human DNA) will be used to enhance the lifesci PaaS software/network licenses and ecosystem. The value of LSCI utility token derives from its consumptive network use as a whole.

LSCI token has a significant utility in the operation of the Lifesci application as healthcare data grows in value. Offering a decentralised data system for healthcare lifesci offers through the token one unit of access that keeps both privacy and security at the forefront of its system.

## lifesci Identity

Health data is becoming the most precious asset in a world that values information above almost anything. But for now data lives in fragmented and disconnected silos. While valuable and necessary, the healthcare industry has a challenge to recollect this data and has a challenge to combine and share those data sources. The healthcare industry will have to create a new data identity and Lifesci wants to leverage Blockchain for that new distributed secure identity and to the ecosystem of organisations, researchers, companies that support it.

In addition to using Blockchain in the financial sphere, it is actively used in the field of identity identification: digital identity, passports, electronic residency, birth and marriage certificates, identity cards, logins and passwords and so on. Decentralised digital identification services use the fact that all users have a personal wallet, and the wallet has an address. This allows you to speed up access to websites, improve usability, provide anonymity and security. Combining the principles of distributed registry and identity, the digital ID can be used as a kind of "digital watermark". Such a "watermark" can be assigned to virtually every online transaction affecting various types of assets.

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# lifesci Data Governance

Governance and data solution architecture are paramount for the healthcare industry as all DNA and health activities are becoming sensitive and precious when it comes to data.

At present health data is fragmented, not related and is being collected by different players which are not connected. There is a need to create a governance model to coordinate different sources of data.

While building any proper data system, governance is critical in a new Blockchain model to manage different sources of data and while finding the best balance how to display the data and its source. For example, the system has to include a governance solution that creates awareness and informs clinical decisions to assist shape personalised predictive medicine. It will also help avoid the lack of credibility that presently happens with the general health care data in the industry. As currently there is little effective integration to improve global, clinical trials and inform better health practices. There needs to be put in practice a solid governance solution between data and the different players.

## lifesci Token Upgradability

The core development team and the lifesci community are committed to ensuring the healthy and legal growth of the value that LSCI brings to the community. Even though, that the Ethereum ecosystem has been around for years, it is still at the very beginning of the development stage. Which means that new token's functionalities are still being developed and researched. Despite that fact, LSCI will remain consistent and persistent. It will not change its functionality, due to the potential risk for the Stakeholders.

## Definition of the LSCI Utility Token

The ERC20 token standard describes the functions and events that an Ethereum token contract has to implement. LSCI token is guided through the following criteria:

- **Property:** LSCI is an expression of IP inside a programmable token. The IP LSCI represent is derived from Lifeci's proprietary data and content — the modules/apps and original production.
- **Utility:** LSCI is also a utility token in the sense that is necessary a LSCI token operate many of the modules in the lifesci ecosystem. Additionally, when Ethereum's protocol is upgraded to allow for tokens to be the gas that pushes transactions through the network, the LSCI token will achieve absolute utility and greater value.

- Income/Rewards: LSCI manages the flow of income and rewards generated through consumption and participation in the ecosystem that are distributed to token holders.
- Fungibility: The most known and understood attribute of LSCI, is that they are replaceable by another identical item, mutually interchangeable.

## lifesci Core Development

20% of LSCI tokens created during the Contribution Period will be allocated to the LSCI Core Development team (will these be defined in the appendix), over an 18-month vesting period, with a 6-month cliff. This will guarantee that tokens devoted to the Team cannot be immediately traded, and will guarantee further interest in executing the platform's long-term goals.

## Development Progress

The project initially started after the SEC announcement with a clear statement to make sure that new projects and platforms will not fall under regulatory problems. lifesci platform has been entirely self-funded by the Team and is 100% owned by the team.

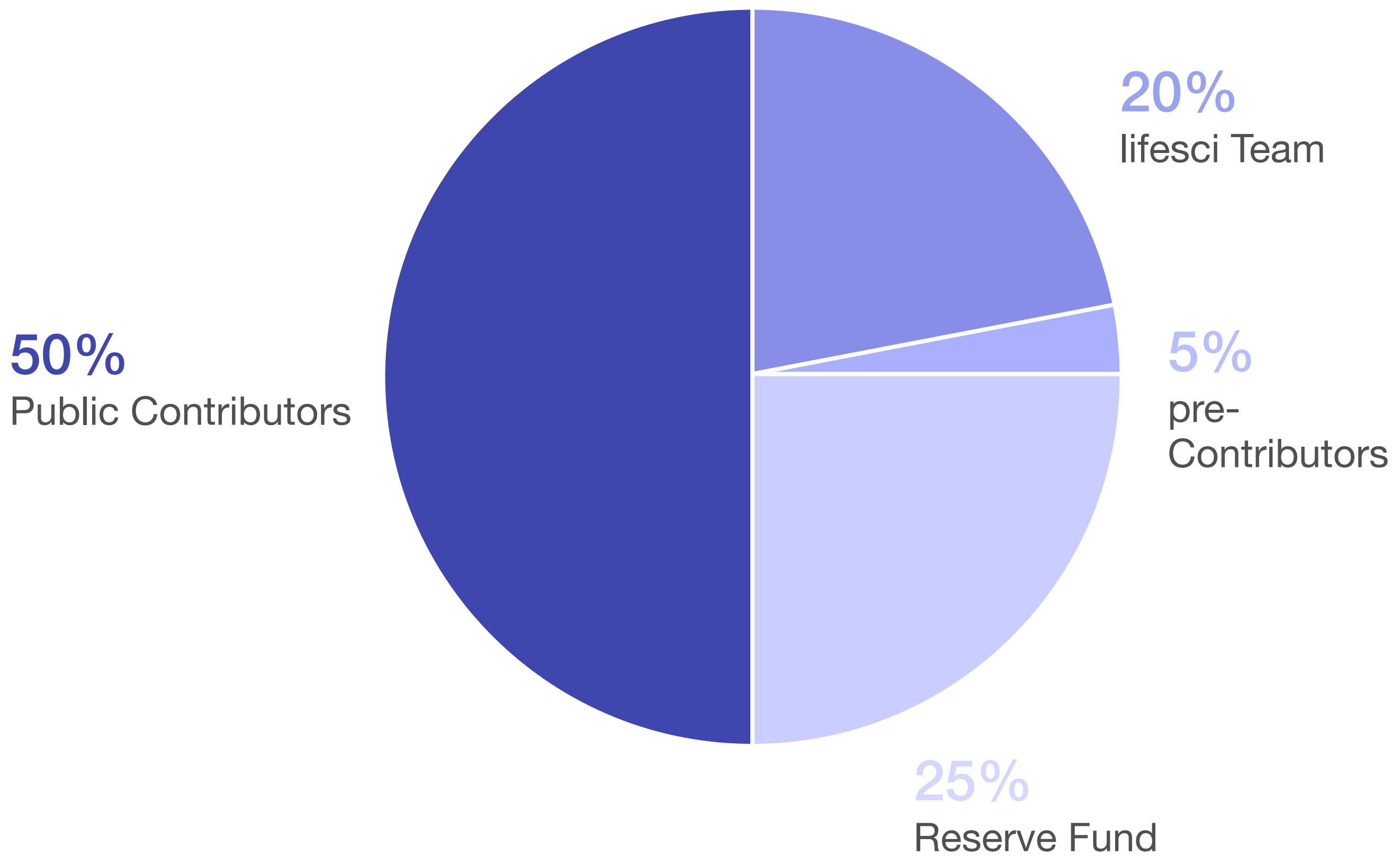
# PRODUCT ROLL-OUT

Key features

<div><div>PHASE 1</div><div>Digital Identity Directory</div><div>10K Organisations</div></div>	<div>Dynamic page with comprehensive local and global listings of Medtech, life science organisations and foundations, with search filters;</div> <div>Infographics and data on organisations</div> <div>AI Smart Contract proof of identity</div> <div>Iterative Machine Learning Curve</div> <div>Mainnet Beta</div> <div>Privacy Features</div> <div>PaaS Draft</div>
<div><div>PHASE 2</div><div>Data Rankings</div><div>100K Organisations</div></div>	<div>Private and public profile</div> <div>B2B community based in P2P insights</div> <div>Social media dashboard data visualisation integration</div> <div>Blogs, newsletters, curated content, intelligence collaboration content`</div> <div>lifesci Platform security audit and product launch</div> <div>Visual Programming</div> <div>Swarm Support</div> <div>Bugfix</div> <div>PaaS Testing</div>
<div><div>PHASE 3</div><div>Resource Centre</div><div>1M Organisations</div></div>	<div>CRM &amp; Data Science Analytics</div> <div>Match organisations &amp; Ecommerce features</div> <div>Global geotargeting and localised edition</div> <div>Automated process of subscription</div> <div>UI regression tests</div> <div>Second Security Audit</div> <div>Global Teller Network</div> <div>Viral Growth Mechanisms</div> <div>Adhoc Mesh Networking</div> <div>PaaS Cloud</div>
<div><div>PHASE 4</div><div>Global Marketplace</div><div>100M Organisations</div></div>	<div>Global supply chain network and DBs accessibility by community</div> <div>Crowdfunding campaings to support new Medtech projects</div> <div>Campaings for crowd engagement and joint ventures</div> <div>Scalable marketplace based on P2P digital currencies</div> <div>Noise Protocol</div> <div>Double Ratchet</div>



# LSCI Allocation Summary

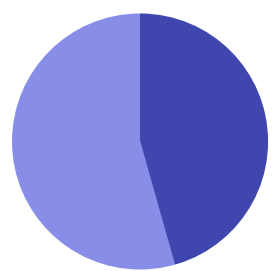


- **5%** of the LSCI allocated the pre-Contribution period will be distributed to the pre-Contributors.
- **20%** of the LSCI created during the Contribution period will be allocated to the lifesci development team, locked in a smart contract with an 18-month vesting period, and 6-month cliff.
- **25%** of LSCI created during the Contribution period will be forming a reserve fund, locked for a minimum of 12 months. The reserve will be used to offer opportunities for the new investors, and can only be activated by the consensus achieved by receiving 50% + 1 vote on the stakeholder meeting.
- **50%** of the LSCI created during the Contribution period will be allocated to the public Contributors.

# Project Budget

Depending on the level of funding the distribution of funds percentage may vary, however, the structure that is proposed below allows us to minimise potential risks and focus on the platform development.

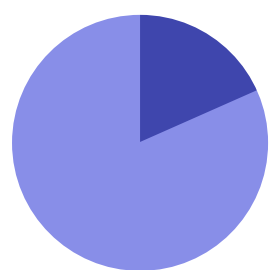
lifesci ambition is to create a platform that will have a secure legal set up and will develop R&D projects involving new peer-to-peer and centralised protocols. The ultimate goal of our platform is to create a strong, safe and trusted environment to activate and support the growth of IT, and crypto sector in the life science ecosystem. As mentioned in the budget outlined below was designed to provide a safe 18-month runway ( but there are no figures in the budget +where is the cash flow statement. In the event when the target of a percentage of the funds is reached, Lifesci will hedge a proportion of the crypto exposure using an industry regulated provider of the funds raised in USD to mitigate price volatility risks.



**45%**

Core development, technology & growth

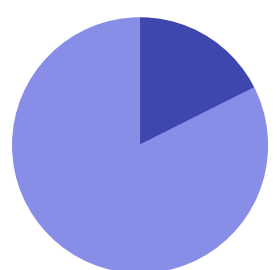
Core development includes both supporting Users and Clients platforms, as well as our community driven services. The budget will be used to upgrade, enhance and develop new features.



**5%**

Legal

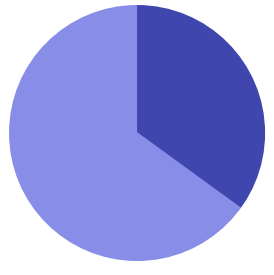
Being compliant and following all regulatory requirements is the key to the lifesci platform. The budget allocated here is to ensure that all legal accounting and regulatory costs are covered.



**15%**

Security

Processing funds always attract various scammers, not even to mention a natural possibility of a human error in the code. That is why this part of the budget will be devoted to enhancing security and community bug bounty programs. This is the core part of Lifesci development budget and foundations.

**35%**

Operations and Marketing

To ensure smooth development process, day-to-day operations will have to be organised as the platform expands. A higher attention the management will be placed upon the growth of these processes. The lifesci platform apart from routine maintenance and upgrades is intended to be available for use on a global basis 24/7. Therefore it is vital to ensure we have a resilient platform with backup as well as the benefits that Blockchain technology offers. It is for this reason that we have recruited a highly capable and competent IT team to build and maintain the platform. lifesci have also engaged independent Advisors to offer their experience and expertise in creating and ongoing monitoring of the platform.



# Team

## Executive Team



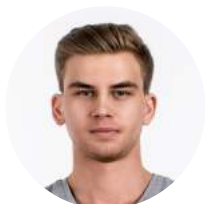
Dinis Guarda  
Chief Executive Officer

Dinis Guarda is an author, founder and experienced CEO, specialised in Strategy, Digital transformation, and a Blockchain, Crypto economics/ ICO Evangelist. He is interested as well in cutting-edge breakthroughs in life science, and green energy solutions using the best of AI, big data, and distributed ledgers. In 2011 he created Ztudium, that manages and publishes [intelligenthq.com](http://intelligenthq.com), [openbusinesscouncil.org](http://openbusinesscouncil.org), [tradersdna.com](http://tradersdna.com), and [hedgethink.com](http://hedgethink.com). He is a guest lecturer at Copenhagen Business School, Cambridge University, Group INSEEC - Monaco University, where he leads the digital master course in London, and teaches digital healthcare. He is an active speaker and author in conferences and other educational events and workshops. Between 2014 and 2015 he was involved in creating a digital bank and investment platform between Asia and Africa funded by among others, Rothschild family. He was involved in its business development, technological setup and legal international foundations working as founder COO and CMO.



Ajan Reginald  
Chairman

In 2009 Ajan founded Celixir, a leading Biotech company that discovers and develops life-saving and life-altering medicines, with Professor Sir Martin Evans, Nobel of Medicine. Ajan remains Celixir's founding CEO and has led the company through exponential growth, 5 funding rounds and successfully brought 2 products to pivotal trials with partners including Harvard, Imperial College and Singapore University. Ajan is the former Global Head of Emerging Technologies, Roche Group and Business Development Director, Roche Pharma where he led major transactions including the \$1.3B Alnylam Partnership. He is an alumni of Boston Consulting Group and Harvard Business School (AMP). Ajan is a graduate of the University of Oxford (MSC, Experimental Therapeutics) and Northwestern University's Kellogg School of Management (MBA). He is a recipient of the UK Fulbright Scholar and Roche Gold Olympiad. And represented the England Masters Hockey Team at the 2016 World Cup and 2017 European Championships.



Anton Mozgovoy  
Chief Technology Officer

Anton Mozgovoy is a technologist, CTO lead blockchain, neuro net, biometric architect, and strategist. He has been working on the blockchain proof of stake solution, proving Nash's equilibrium. From May 2017 to October 2017 he was the leading technologist at Humaniq. For this organisation, he built its blockchain architecture, biometrics, and crypto messenger type app (deployed in Africa to an audience of thousands of people). He designed the platform API, now serving as a full identity management system. He built and fixed the crypto solution tech set up for the ICO token HMQ. He negotiated and managed the integration of the token in 8 exchanges, reaching \$32million in the 3d month. He created the Humaniq data explorer using PWA technology and designed and projected Humaniq's CI/CD pipeline. He also worked on the geofencing technology to perform efficient queries of geotagged data. In 2015 he founded the startup Finlyt - algorithmic installment and revolving credits. In 2015 he joined a project developed by the National Bank of Toronto to build a national financial system based on the blockchain.



Jonny Fry  
Chief Financial Officer

Jonny Fry is a blockchain, crypto economics, ICO, and funds specialist, with over 25 years experience as CEO of an asset management business which he floated in London with over £1 Billion under management. His focus has been on the dynamics of financial innovation, advising on ICOs, Tokenomics, Crypto funds and he is a regular speaker on these topics.

He has extensive knowledge and experience of the financial services sector. Looking after private clients and institutions assets managing funds in the UK and overseas. He has been CEO and on the board of a variety of regulated and unregulated companies in the U.K. and overseas, in a number of different industries. He has first-hand experience of working with the press and managing corporate and reputational risk for a number of organisations.



Adriana Herrera  
Chief Operations Officer

Adriana Herrera was a Director and Chief of Staff for the Latin America region. She is responsible for overseeing the regional CEO's operations, supporting the execution of strategic and tactical decisions related to the business. She has been with Citi for 19 years where she has held multiple roles in various businesses in Europe, Asia, North America and Latin America, delivering and managing products and technology solutions to Corporate and Private Bank Clients.

Adriana has been recognized for her involvement in diversity efforts around recruiting, mentoring and development of young executives. She contributes to organizations such as Children International, Animal Care and Control and she serves in the Committee for Young Patrons at Carnegie Hall. Adriana holds a Bachelor of Science in Systems Engineering and Management from EAFIT University, a Master of Science in Organizational Development and Consultancy from Sheffield-Hallam University, and a Master Certificate in Project Management from George Washington University.



Lene Schulze  
VP Partnerships

Lene Schulze is a trusted entrepreneurial and innovation leader and startup expert with international experience in funding, social impact and commitment to driving results. Lene has been working between Europe and America. She has a strong track record of success in founding and managing organizations and programs that bridge companies of all sizes into the Silicon Valley innovation ecosystem. Lene Schulze spent the last 12+ years advising and building strategic partnerships on behalf of technology start-ups and large corporations.

She teaches Executive MBA's, graduate and undergraduate students, about the Silicon Valley innovation ecosystem, its mindset, entrepreneurship and corporate innovation, at INSEEC San Francisco. Between Apr 2016 – May 2017 she was the Co-founder, Deloitte Nordic Labs. She was the Deputy Director of the Innovation Center Denmark which facilitates the entry of technology based Danish companies into Silicon Valley.



Allan Griffin  
Chief Marketing Officer

Alan Griffin is a thought leader, change maker and an award-winning Global digital, data and business leader. Alan has been working in strategic global roles for Time inc, Forbes, Reuters, the FT and AOL in the UK, US and Asia. He has 20 years experience building ecosystem, communities, market and audience leading products and services around the World. Allan is P&L oriented and driven, enabling and building teams to achieve outstanding results. He consultative and analytical by nature, bringing transformational and innovative ideas to life. Strategic thinker who thrives in delivering roadmaps and managing complex projects. Allan is also customer focused with the sales and marketing experience to compliment user insights.



Anca Petre  
R&D Expert

Anca Petre is a healthcare innovation and blockchain thought leader, writer, and influencer. She is Pharm.D. and Business double degree candidate specialised in digital health. She is currently working on a Ph.D. thesis about the use of blockchain technology in the health sector. Anca is passionate about innovation in life sciences and healthcare. She is driven by the desire to take part in the ongoing digital revolution in the healthcare industry and participate in building tomorrow's health system. Anca is also a consultant at 23Consulting which is a company focused on educating and supporting healthcare firms in developing projects using blockchain technology, Anca publishes her research and analysis as a writer on various platforms such as IntelligentHQ and IMT.

# Scientific Advisors



Prof. Sir Martin Evans  
Chief Scientific Advisor

Sir Martin John Evans FRS FMedSci. In 2007, shared the Nobel Prize in Physiology or Medicine in recognition of his discovery and contribution to the efforts to develop new treatments for illnesses in humans.

In 1978, he moved to the Department of Genetics, at the University of Cambridge, and in 1980 began his collaboration with Matthew Kaufman.

Professor Sir Martin Evans is a co-founder of Celixir. In 1981 he isolated the first embryonic stem cells. Over his career, Sir Martin has published more than 120 scientific papers and received numerous awards for his ground-breaking research. Alongside his 2007 Nobel Prize, Sir Martin has also been awarded the prestigious Albert Lasker Award in 2001, the Gold Medal of The Royal Society of Medicine, the Copley Medal of the Royal Society and the Baly Medal of Royal College of Physicians, all in 2009.



Dr Sabena Sultan  
Scientific Advisor

Sabena Sultan is the British Heart Foundation Principal Investigator Grant Holder, Cardiovascular Medicine Department, Kings College London, Postdoctoral Scientist at Rayne Institute, Cardiovascular Medicine Department, University of London. She completed PhD in Cardiovascular Medicine, Imperial College School of Medicine. Panagiotis Givissis is currently Associate Professor of Orthopaedics, Aristotle University of Thessaloniki, from 2008 to present Orthopaedic Training Programme in Manchester, UK. She holds Medical Degree, Orthopaedic Surgeon Specialty Degree and PhD Member and He is also the past president of Hellenic Association of Orthopaedic Surgery and Trauma. Dr Sabena Sultan leads Celixir's R&D efforts across therapy areas for 4 last years.

Some of her Latest Research Outputs include: Flow-dependent increase of ICAM-1 on saphenous vein endothelium is sensitive to apamin Sultan, S., Gosling, M., Abu-Hayyeh, S., Carey, N. & Powell, J. T. Jul 2004.



Dr. Armand Keating  
Scientific Advisor

Dr. Armand Keating obtained his MD degree from the University of Ottawa, completed internal medicine and hematology training at the University of Toronto and a research fellowship at the University of Washington and the Fred Hutchinson Cancer Research Center in Seattle, Washington. He was a Cancer Research Scientist at the National Cancer Institute of Canada for 10 years upon his return to Toronto. In 1986, he established the University of Toronto Autologous Blood and Marrow Transplant Program and led it to become the largest stem cell transplant program in Canada.

For a decade until 2006, he was Chief of Medical Services and Head of the Department of Medical Oncology and Hematology at Princess Margaret Hospital/Ontario Cancer Institute as well as Director of Hematology-Oncology at Mt. Sinai Hospital.



Prof. Stephen Westaby  
Scientific Advisor

Professor Stephen Westaby FRCS (born 27 July 1948) is a British heart surgeon at John Radcliffe Hospital, Oxford, England. He won the award of Midlander of the Year in 2002. He attended Henderson Avenue Junior School and Scunthorpe Grammar School (High Ridge School from 1968). He went to Charing Cross Hospital Medical School. Westaby and his team performed Peter Houghton's heart operation in June 2000, implanting a Jarvik 7 artificial left ventricular assist device, a turbine pump. Peter Houghton (1938–2007) became the longest living person with an electric heart pump in the world.

His memoir of his career as a heart surgeon, *Fragile Lives: A Heart Surgeon's Stories of Life and Death on the Operating Table*, was published in 2017 by HarperCollins.





Carolyn Lam Su Ping  
Scientific Advisor

Carolyn is a Senior Consultant of the National Heart Centre, Singapore; Associate Professor, Duke-NUS Cardiovascular Academic Clinical Program, Singapore. Chairperson of the Asia Pacific Association of Women's Cardiovascular Disease. Dr Carolyn Lam graduated from the Faculty of Medicine, National University of Singapore, completed advanced specialty training in Cardiology in Singapore, and pursued her Research Fellowship at the Cardiorenal Laboratory, Heart Failure Fellowship at the Division of Cardiovascular Diseases, and Advanced Cardiology and Master of Biomedical Sciences at Mayo Clinic, Rochester MN. She further obtained training in clinical and genetic epidemiology at the Framingham Heart Study in Boston, MA before returning to Singapore in 2010 on the National Medical Research Council's Clinician Scientist Award.

Dr Lam's clinical sub-specialty is heart failure, and she is recognized globally for her expertise in heart failure with preserved ejection fraction.



Dr. Lee Chapman  
Scientific Advisor

Professor Lee Chapman completed his PhD entitled "A Blueprint for 21st Century Road Ice Prediction" here in Birmingham. The aim of the project was to assimilate new technologies to develop the next generation of road weather prediction models (Route Based Forecasting). The project involved the development of GIS models which utilised new survey techniques based upon GPS measurements and digital image processing.

A university spin-out company called Entice Technology Ltd was set up using funding received from the NERC SBRI scheme (£125k) to fund further technological development, protection of intellectual property by the filing of patents and commercialisation of the work carried out for the PhD. The business was sold in 2006 to Weather Services International Ltd. Professor Chapman is still actively involved in research and business engagement with respect to winter road maintenance. He is presently the President of the Standing International Road Weather Commission (SIRWEC).



Dr. Daniela Andrich  
Scientific Advisor

Miss Andrich is a Consultant Reconstructive Urological Surgeon working together with Professor AR Mundy forming one of the leading Reconstructive Urology Units world-wide with particular expertise in all aspects of urethral reconstruction, all types of complications arising from prostate cancer treatments, repair of complex urological fistulae and other urological aetiologies requiring reconstructive surgery. As a full-time Consultant Miss Andrich operates 2 days/week at UCLH.

Miss Andrich is a Honorary Senior Lecturer at UCL and organises the annual post-graduate Masterclass in Genito-Urethral Surgery, held at The Education Centre of UCLH in association with the British Association of Genito-Urinary Reconstructive Surgeons (BAGURS) and the Royal College of Surgeons of England.



Eiho Nakatani  
Country Advisor

Eiho is a president, Managing Director at Becker Air Techno Becker Airtechno. He also possesses Harvard Business School Executive Education.

Eiho started as a Semiconductor Design Engineer at Zuken back in 2000. Where he was responsible for Verilog/VHDL mixed design, EDA tools, Simulator, Synthesis, DFT, etc. Eiho also worked at SONY as a guest engineer for 3 years. In 2006 Eiho worked at Global Vision Technology, where he was responsible for setting and executing corporate strategy.

From 2012 Eiho served as a market development Manager Asia Pacific in Moog Inc. He managed \$15+M sales in Asia Pacific region. Developed comprehensive sales strategies across industrial market segments, including Aircraft, Military, Space, Automotive, Medical, Industrial Automation, Heavy Industry, Power Generation, Marine, and Security. From 2014 he served as a President, Managing Director at Becker Air techno.

# Crypto, Investment and Legal Advisory



Michael Terpin

Michael Terpin is a leading global expert and entrepreneur in communications and PR and in the last years he has become an authority on ICOs and crypto currencies. Michael Terpin spent his career innovating in PR, technology platforms, and the space in between. Currently, he runs Transform Group, the world leader in blockchain and ICO PR and advisory services (40 ICOs and counting). In 1999, Michael Terpin spun off Internet Wire, which he launched in 1994 as the first Internet-based company newswire, and raised \$18 million from top-tier investors including Hummer Winblad and Sequoia Capital. Following a strategic investment by NASDAQ in 2003, the company became Market Wire (now Marketwired) and he sold it to CCN/Matthews in April 2006, which in turn was sold to OMERS Capital Partners in December 2006, for more than \$100 million. Marketwired ([www.marketwired.com](http://www.marketwired.com)) is currently the world's third largest company newswire.



Tariq Khan

Tariq was called to the Bar of England and Wales, working as a regulatory and transactional lawyer at financial services firms such as GE Money. In 2006 he joined the co-founding team at the MBO of a fledgling financial services company that went on to be one of the UK's fastest growing companies for four years running, and a market leader in data analysis and customer-specific strategies. As Chief Legal & Compliance Officer he had oversight of all regulatory implementation and the negotiation of complex transactions. In 2011 he was voted by the industry to the Board of its trade association, the CSA, with responsibility for promoting compliance by its 400+ members whilst working with regulators and other bodies to ensure proportionate and operationally workable regulation. He was Entrepreneur in Residence at the 2017 Barclays Techstars fintech accelerator programme and a mentor at the F10 fintech accelerator.



Paul Mears

Paul Mears is a financial professional and serial investor specialised in finance, healthcare, technology and alternative investments. He is the CFO and a co-founder of MoneyMailMe and is behind the Modex smart contract platform project. Paul started his career working in traditional pure accounting and finance and progressed into various commercial finance management roles. He has invested as a business angel in more than 20 companies, with a focus in the fields of cutting-edge Biotech, Med Devices, Fintech, Technology and Applications with the investee companies located in the UK, France, Sweden, and the USA.



David Drake

David Drake is serial entrepreneur, thought leader and investor. He is the Chairman of LDJ Capital, a family office based in US. The LDJ Capital Multi-Family Office is the culmination of our executives' career-long journey to serve UHNW families and individuals in a different way. David is founder and investor in Victoria Partners, a 300 family office network based in London, UK; LDJ Real Estate Group and Drake Hospitality Group. He is the founder and chairman of The Soho Loft Media Group with divisions Victoria Global Communications, Times Impact Publications, and The Soho Loft Conferences.



Nsofor Dickson

Nsofor Dickson is a serial entrepreneur who has led organisations in an Internet, mobile technology. Dickson has years of experience as a Blockchain researcher and Advisor to a number of companies and African Banks. He soon became a Lecturer at INSEEC Business School London, teaching Blockchain for Finance and Social Good. He founded Lixon Mobile, a low-cost mobile phone brand focused in the Chinese and West African Markets. In 2017 he Founded Kora.



Alexander Perkins

Alexander is an investor relations, tech and fintech consultant and experienced venture capitalist. He is a fintech consultant at Uptick Growth, focusing on consulting engagements in the blockchain sphere. Previously, Alexander was an associate at Deep Knowledge Life Sciences, focusing on venture investments in the biotech sector. He earned his Masters in Finance from Claremont McKenna College, completing a thesis in credit risk modeling. He has been working with various Initial Coin Offers special in diligence set up and investment set up.



# Technology Advisory



Anish Mohammed

Anish Mohammed is an alumnus of the University of London, Stanford University's Ignite, MIT and Singularity University GSP Program, and co-founder of Openeth and Obol. Anish is an accomplished multi-disciplinarian who has worked as a medical doctor, bioinformatician, strategy consultant and cryptographer. He has spent half his career researching cryptographic algorithms and protocols at three different research groups. Anish is one of the founding members of UK Digital Currency Association. His research interests include AI and Ethics of AI, and he is also a member of advisory board of Institute for Ethics and Emerging Technologies. He advises various startups including Collider-X, Adjoint, Arteia, Privacy Shell, Ripple Labs, and Hyperloop Transport Technologies, EA Ventures, IEET and Chain of Things.



Thomas Power

Thomas Power is a leading digital, author, strategist thought leader and social media expert. He is a cutting edge Board Member, deeply connected in Silicon Valley, NYC, London, Australia, New Zealand with nearly 200,000 Twitter followers since March 2007. Raised over \$100m since 1980. Focused on AI Big Data Bitcoin Blockchain Ethereum FinTech ICO SaaS Social Media Tokenomics very geeky and Social. He is a nonexecutive director of 9 Spokes which an Australian quoted firm offering a free data dashboard that connects apps to identify powerful insights to deliver business KPI's for SMEs. He is a non-executive director of the Business Café a Franchise network of local café's that offers 'members' a social space to meet, support, swap contacts and knowledge and generally become trusted business friends.



Federico Pistono

Federico Pistono is a writer, entrepreneur, researcher, and public speaker. He holds a BSc in Computer Science from the University of Verona, and he's a graduate of Singularity University, NASA Ames Research Park. He has co-founded four startups—two in Italy and two in the US—in the fields of e-learning, media production, and distribution, wireless communication technology. He has consulted on technology and innovation for governments and Fortune 500 companies across the world. In 2012 he wrote the book "Robots Will Steal Your Job, But That's OK: How to Survive the Economic Collapse and be Happy".



Vishal Mishra

Vishal Mishra is an entrepreneur, engineer, AI scientist and big data leading authority and thought leader. He is the CEO & Co-Founder at Right Relevance Inc. Right Relevance offers data visualisation, APIs, and social media big data Relevance-as-a-Service services and solutions. In the past, he worked for over 15 years in Microsoft as leading security engineer, where is was Principal Security Lead for Azure Microsoft. While at Microsoft he worked on various large-scale security data analysis (security as data) for monitoring projects, detection, alerting, pattern analysis; Forensics at scale; Operational Security/Red team; SDL for Azure.



Iggy Bassi

Iggy Bassi has over 20 years' experience in the technology, finance, and impact markets – in both emerged and emerging markets. He has advised many global companies (inc. Fortune 500), sovereigns, and entrepreneurs on solving problems in competitiveness, sustainability, and structuring complex transactions. His previous venture GADCO, focused on sustainable and climate-smart agriculture and livelihood development in West Africa using LATAM technologies. GADCO secured investors (>\$24m).



Alexei A. Poliakov

Alexei holds a Ph.D., Biology from Moscow State University. He has dedicated more than ten years of scientific research on AI spatial behavior in live systems. Alexei developed a concept of Positional Identity, which laid the foundation for Geo-Behavioral Interest Profiling algorithm and its commercial applications. He uses different sources of data and social media and is able to aggregate APIs and data mine and segment intelligent insights. He is the founder of the biological / location big data platform Localizer.



# Operations Team



**Zeeshan Malick**  
Digital Lead

Zeeshan Mallick is a digital thought leader and a professional with global experience in digital marketing strategy. He has a multi-channel marketing background, having worked in the public & private sector, as well as agency & client side, in projects addressing finance, e-commerce, travel, technology, start-ups, banking, teaching and training.

Some of the brands & digital agencies he has worked with include Ted Baker, French Connection, Sony Ericsson, Emirates Airlines, Etihad Airlines, Dubizzle.com, Accenture, HSBC MENA, Mindshare MENA, MEC UK, RBS & NatWest, Barclays, Microsoft, NHS, Sapient Nitro, Department of Health & Humaniq. Over the past years he has been worked in the blockchain, ICOs and cryptocurrency industry focusing on business and strategy solutions. In 2015, Derin created with Dinis Guarda, Blockchain Age, the global leader in blockchain research and consultancy. Zeeshan is a lecturer of Digital Marketing Studies at Sup de Pub (Groupe INSEEC), which is a postgraduate course for Master's degree students in London.



**Derin Cag**  
Digital Expert

Derin Cag is a digital and social media specialist with global expertise in digital transformation and a global top influencer in blockchain and crypto economics. He is the founder of Richtopia, an online business magazine and blog covering a mix of valuable content written by thought-leaders, top lists of influencers, and inspirational videos with successful authorities in their respective areas of expertise. In addition to Richtopia, Derin is also the co-founder (with Tim Campbell MBE) of professional services firm Marketing Runners Ltd. Marketing Runners Ltd provides advisory and consultancy services on web development, social media marketing, digital asset mergers & acquisitions, video production, public relations, and crisis management.

In 2015, Derin created with Dinis Guarda, Blockchain Age, the global leader in blockchain research and consultancy. Derin is a lecturer of Digital Marketing Studies at Sup de Pub (Groupe INSEEC), which is a postgraduate course for Master's degree students in London.



**Sam Merad**  
Pharma Industry Business Relations

Healthcare business professional with experience in Europe, US and Silicon Valley. Sam is an ambitious healthcare professional finishing his Pharmacy Doctorate at University of Paris-Saclay. Sam did his clinical training at Pitie-Salpetriere Hospital, in Pneumology dept., then Parasitology dept. Sam has an Entrepreneurship program at ESSEC Business School, Centrale Paris. He was involved in an international Bachelor in Business at INSEEC Paris, London and San Francisco. He is deeply interested by International Business Development in Healthcare Industry and driven by the desire to build Tomorrow's Health.



**Maria Fonseca**  
Content Management

Maria Fonseca is an accomplished multi-disciplinarian author and researcher who has worked as a medical doctor, writer, editor, and filmmaker. She is the editor of IntelligentHQ. Initially trained as a doctor Maria has shifted for research around innovation and future solutions. She is the author of books including Trading For A Social Or Environmental Purpose Kindle Edition, Amazon. Aside from her work for IntelligentHQ, Maria Fonseca is a visual artist and filmmaker holding a Ph.D. at the University of Westminster in London. She is preparing her postdoc that will explore the links between creativity, innovation and the sharing economy.



Kherel Kechil  
Frontend Lead

Kherel Kechil is a technologist and web leading developer. He started his career writing web applications with Ruby on Rails and building websites. He previously created and ran a startup web organization, called epistles.com. Later, Kherel switched to SPA development on react.js. In particular, he was part of the development team for the website of.ru, operated by one of the largest rental agencies in Russia where he was in charge of the mobile version of the website.



Olga Deribo  
Design Architect

Olga specialises in conceptual design, which she mastered during her studies at Birmingham Institute of Art and Design and University of the Arts London. Olga has served as a Design Architect at Apex Circuit Design from 2012. After that, she has opened her own digital agency, which she has been running successfully for more than 6 years, creating and establishing numerous brands.



Kareem Hepburn  
Team Lead

Kareem served as a Senior Software Engineer for Enova International, a financial tech firm focused on closing the world's credit gap. Before joining Enova, he worked for SitterCity as a contractor and has built their demand marketplace product DateNight (HelloChime).



Georgii Oleinikov  
Backend Developer

Georgii graduated from Karazin KhNU, where he also served as a Teaching Assistant back in 2010. After that, for almost 2 years Georgii worked at the Department of Computer Science at UBC, where he also served as a Teaching Assistant. Since 2014 Georgii was working as Software Development Engineer at Amazon on numerous large and small projects.

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# Glossary

- **ADME**

ADME is an abbreviation in pharmacokinetics and pharmacology for "absorption, distribution, metabolism, and excretion," and describes the disposition of a pharmaceutical compound within an organism.

- **AI (Artificial Intelligence)**

AI is intelligent behaviour by machines, rather than the natural intelligence (NI) of humans and other animals. In computer science AI research is defined as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of success at some goal.

- **API**

An application programming interface (API) is a set of subroutine definitions, protocols, and tools for building application software. In general terms, it is a set of clearly defined methods of communication between various software components.

- **Augmented reality**

Augmented reality, or AR, has been called the next big paradigm shift in computing, tantamount to the kind of transformational changes that the internet and the smartphone made in the field. Global technology leaders, including Google, Microsoft, Facebook, Snapchat and Apple, have all staked significant claims in the AR “digital” land rush.

- **Big Data**

Big data is a term for data sets that are so large or complex that traditional data processing application software is inadequate to deal with them. Big data challenges include capturing data, data storage, data analysis, search, sharing, transfer, visualisation, querying, updating and information privacy.

- **B2B**

Business-to-business, denoting trade conducted via the Internet between businesses.

- **B2B2C**

Business-to-business-to-consumer is a business model where online, or e-commerce, businesses and portals reach new markets and customers by partnering with consumer-oriented product and service businesses.

- **B2C**

Business-to-consumer, denoting trade conducted via the Internet between businesses and consumers.

- **Biotechnology**

The exploitation of biological processes for industrial and other purposes, especially the genetic manipulation of microorganisms for the production of antibiotics, hormones, etc.



- **Blockchain**

Blockchain is a transaction database shared by all nodes participating in a system based on the Bitcoin protocol. A full copy of a currency's block chain contains every transaction ever executed in the currency. With this information, one can find out how much value belonged to each address at any point in history.

- **Cloud computing**

Cloud computing is an information technology (IT) paradigm, a model for enabling ubiquitous access to shared pools of configurable resources (such as computer networks, servers, storage, applications and services), which can be rapidly provisioned with minimal management effort, often over the Internet.

- **Crowdfunding**

Crowdfunding is the practice of funding a project or venture by raising many small amounts of money from a large number of people, typically via the Internet. Crowdfunding is a form of crowdsourcing and of alternative finance.

- **Crowdsourcing**

Crowdsourcing is a specific sourcing model in which individuals or organisations use contributions from Internet users to obtain needed services or ideas.

- **Cryptocurrency**

A cryptocurrency (or crypto currency) is a digital asset designed to work as a medium of exchange using cryptography to secure the transactions and to control the creation of additional units of the currency. Cryptocurrencies are classified as a subset of digital currencies and are also classified as a subset of alternative currencies and virtual currencies.

- **Cryptography**

Cryptography is the practice and study of techniques for secure communication in the presence of third parties called adversaries. More generally, cryptography is about constructing and analyzing protocols that prevent third parties or the public from reading private messages; various aspects in information security such as data confidentiality, data integrity, authentication, and non-repudiation are central to modern cryptography.

- **Currency**

Currency refers to money in any form when in actual use or circulation as a medium of exchange, especially circulating banknotes and coins.

- **Digital identity**

A digital identity is information on an entity used by computer systems to represent an external agent. That agent may be a person, organisation, application, or device.

- **Distributed ledgers**

A distributed ledger is a consensus of replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, or institutions. There is no central administrator or centralised data storage.

- **eGov**

eGovernment is the use of information and communication technologies (ICTs) to improve the activities of public sector organisations.

- **Exchanges**

Digital currency exchanges (DCEs) or bitcoin exchanges are businesses that allow customers to trade digital currencies for other assets, such as conventional fiat money, or different digital currencies. They can be market makers that typically take the bid/ask spreads as transaction commissions for their services or simply charge fees as a matching platform.

- **Genome**

A genome is the genetic material of an organism. It consists of DNA (or RNA in RNA viruses). The genome includes both the genes (the coding regions), the noncoding DNA and the genetic material of the mitochondria and chloroplasts.

- **Healthcare**

The organised provision of medical care to individuals or a community.

- **ICO**

An ICO is an unregulated means by which funds are raised for a new cryptocurrency venture. An Initial Coin Offering (ICO) is used by startups to bypass the rigorous and regulated capital-raising process required by venture capitalists or banks. In an ICO campaign, a percentage of the cryptocurrency is sold to early backers of the project in exchange for legal tender or other cryptocurrencies.

- **IHE**

Integrating the Healthcare Enterprise (IHE) is a non-profit organization based in the US state of Illinois. It sponsors an initiative by the healthcare industry to improve the way computer systems share information. IHE was established in 1998 by a consortium of radiologists and information technology (IT) experts.

- **In Vivo**

Studies that are in vivo are those in which the effects of various biological entities are tested on whole, living organisms or cells, usually animals, including humans, and plants, as opposed to a tissue extract or dead organism.

- **IP (Internet Protocol)**

A set of rules governing the format of data sent over the Internet or other network.

- **Life Sciences**

A branch of science (such as biology, medicine, and sometimes anthropology or sociology) that deals with living organisms and life processes.

- **Liquidity**

Liquidity describes the degree to which an asset or security can be quickly bought or sold in the market without affecting the asset's price.

- **LSCI**

LSCI is Lifesci's token. It has 23.000.000 tokens available.

- **Master patient index**

A master patient index is a database that is used across a healthcare organization to maintain consistent, accurate and current demographic and essential medical data on the patients seen and managed within its various departments.

- **Mining**

Mining is the process of adding transaction records to Bitcoin's public ledger of past transactions. This ledger of past transactions is called the blockchain as it is a chain of blocks.

- **MVP**

A Minimum Viable Product (MVP) is a product with just enough features to satisfy early customers, and to provide feedback for future product development.

- **On-Chain Data**

On-Chain Data refers to transactions made on the blockchain. A transaction is a transfer of value that is broadcast to the network and collected into blocks.

- **Off-Chain Data**

An off-chain transaction is the movement of value outside of the blockchain.

- **PaaS (Platform-as-a-Service)**

Platform as a service (PaaS) is a complete development and deployment environment in the cloud, with resources that enable you to deliver everything from simple cloud-based apps to sophisticated, cloud-enabled enterprise applications. PaaS includes infrastructure—servers, storage, and networking—but also middleware, development tools, business intelligence (BI) services, database management systems, and more.

- **Patent**

A government authority or licence conferring a right or title for a set period, especially the sole right to exclude others from making, using, or selling an invention.

- **PCOR**

The generation and synthesis of evidence that compares the benefits and harms of alternative methods to prevent, diagnose, treat, and monitor a clinical condition or to improve the delivery of care. The purpose of comparative effectiveness research is to assist consumers, clinicians, purchasers, and policy makers to make informed decisions that will improve health care at both the individual and population levels.

- **PII (Personal identifiable Information)**

PII, as used in information security and privacy laws, is information that can be used on its own or with other information to identify, contact, or locate a single person, or to identify an individual in context.



- **PK**

Pharmacokinetics is a branch of pharmacology dedicated to determining the fate of substances administered to a living organism.

- **Precision medicine**

Precision medicine (PM) is a medical model that proposes the customization of healthcare, with medical decisions, practices, or products being tailored to the individual patient.

- **Smart contract**

Smart contracts are self-executing contracts with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements contained therein exist across a distributed, decentralised blockchain network. Smart contracts permit trusted transactions and agreements to be carried out among disparate, anonymous parties without the need for a central authority, legal system, or external enforcement mechanism. They render transactions traceable, transparent, and irreversible.

- **Token/Coin/Cryptocurrency**

A token makes reference to a unit of value issued by a private entity.

These are digital currencies like Bitcoin in which encryption techniques are used to regulate the generation of units of currency and verify the transfer of funds. They are operating independently of a central bank. Soon every fiat currency may become a cryptocurrency, in that case operating with central banks.

- **Toxicity studies (Tox)**

Toxicity studies in the animal models are done to determine the dose level recommended for the treatment of disease as drug.

- **VCs**

Venture capital (VC) is a type of private equity, a form of financing that is provided by firms or funds to small, early-stage, emerging firms that are deemed to have high growth potential, or which have demonstrated high growth (in terms of number of employees, annual revenue, or both).

- **Wearables**

Wearables are miniature electronic devices that are worn under, with, or on top of clothing. This class of wearable technology has been developed for general or special purpose information technologies.

- **WHO**

The World Health Organization (WHO) is a specialized agency of the United Nations that is concerned with international public health.