



Empowering the well-being of people

November 2020

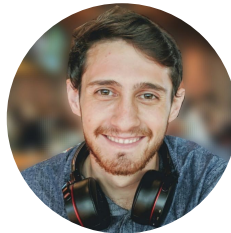
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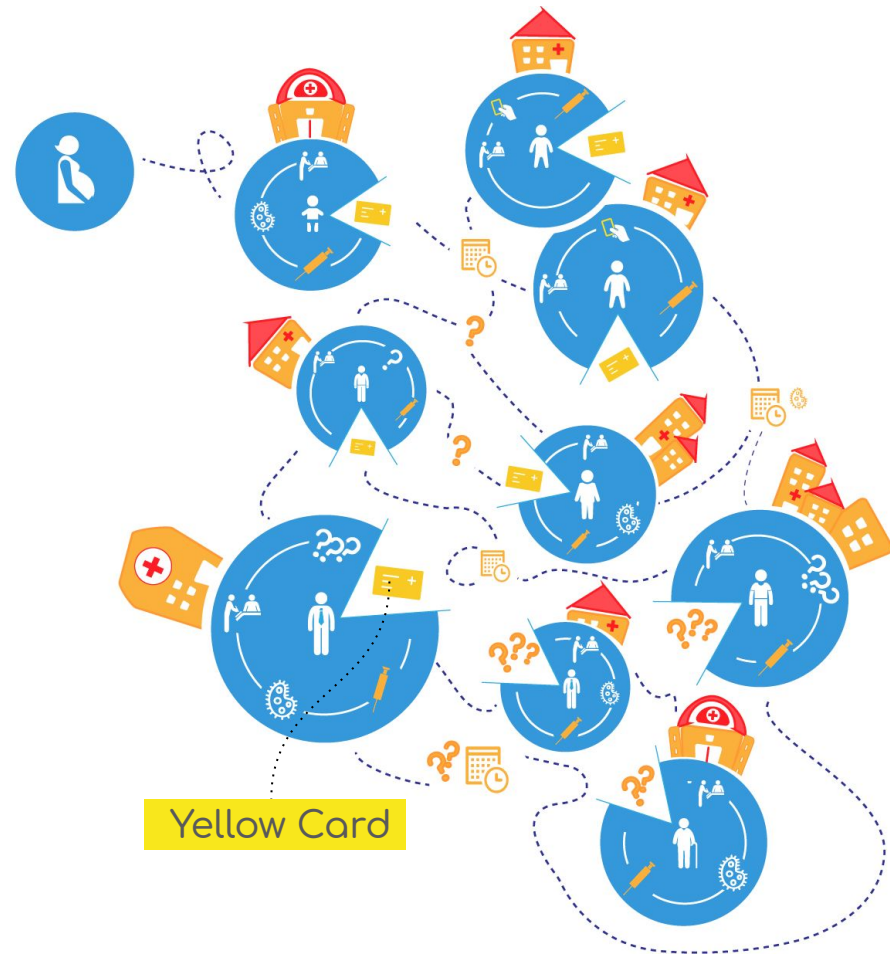
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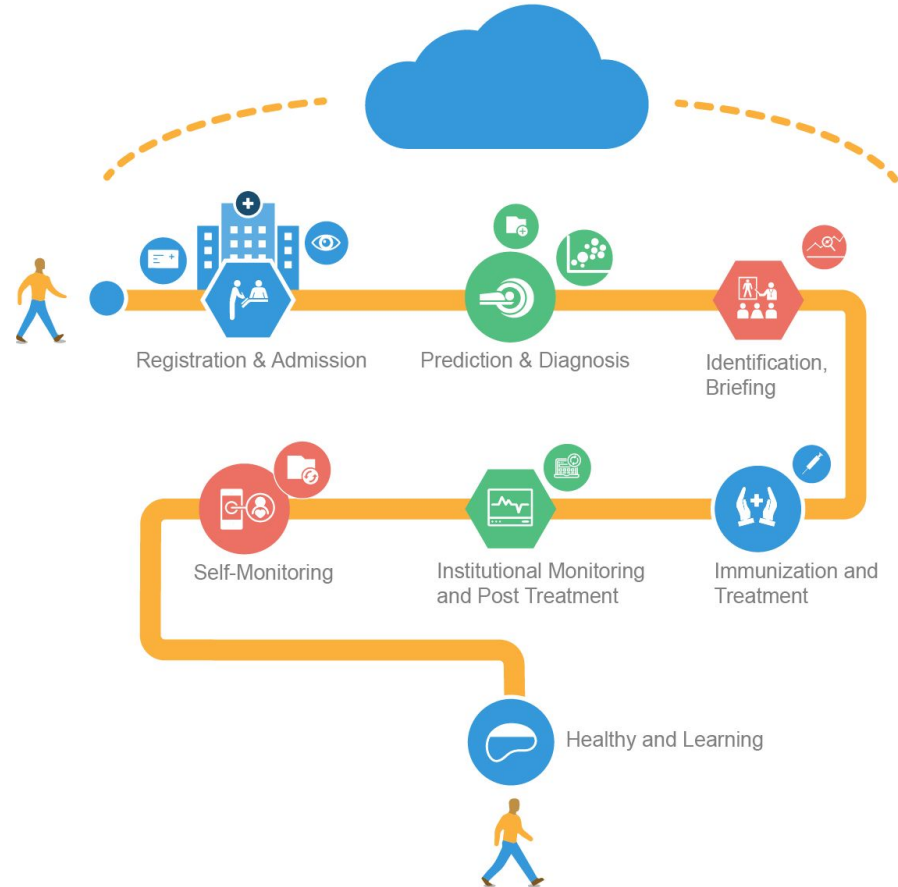
# The Problem - Today

- The healthcare landscape is **fragmented**, **siloed** and frustrating for patients to navigate
- This problem **persists** with **vaccination data** that is stored on a paper-based system, the **Yellow Card**
- The card is easily **misplaced**, leading to the lost of valuable information
- This places the most **vulnerable members** of our society **at risk** from preventable illness

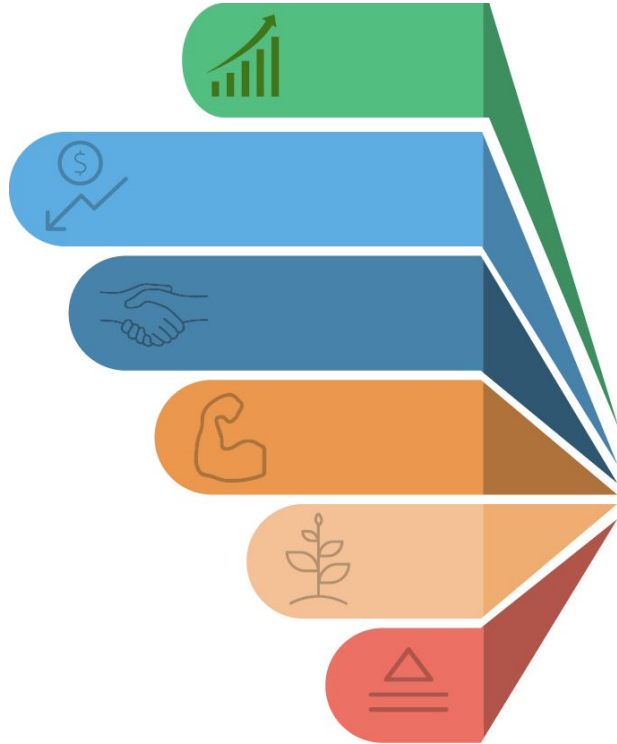


# Introducing Yello - New Beginnings

- **Yello** is a **blockchain-based vaccination record** that allows individuals to store their vaccination history, much like a **Yellow Card**
- **Yello** leverages decentralized technology to support healthcare providers and citizens' needs for **security** and **accessibility** to their vaccination data
- **Yello** empowers the right care at the right time, **placing patients in control** of their vaccination history at any point of care

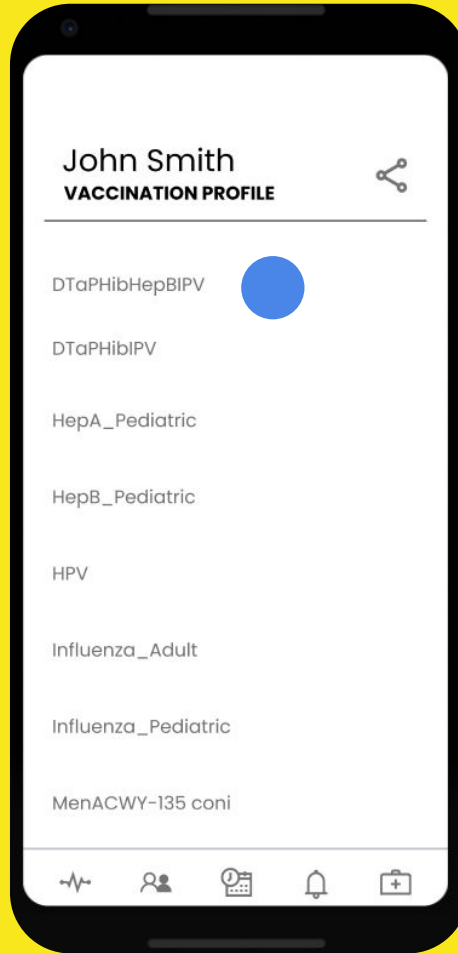


# Benefits of Yello



- **Focusing on preventative care for high-risk individuals:**
  - **Simplifying communications** between patients and healthcare providers
  - **Providing vaccinations** to **high-risk individuals** in a timely manner
- **Putting patients in the centre of care:** Leveraging blockchain to enable and **empower patients to own, and manage their own data**
- **Reducing the cost of healthcare:** **Reduction of complexities** will lower costs
- **Creating a platform to develop future solutions for patients:** **New services** can be developed and introduced to the market

# Yello Demo



Relevant links:

[GithubYello-mobile](#)

[Yello Doctor App Install - Android APK](#)

[Yello Patient App Install - Android APK](#)

# Certificate of Authentication

Enter the transaction ID

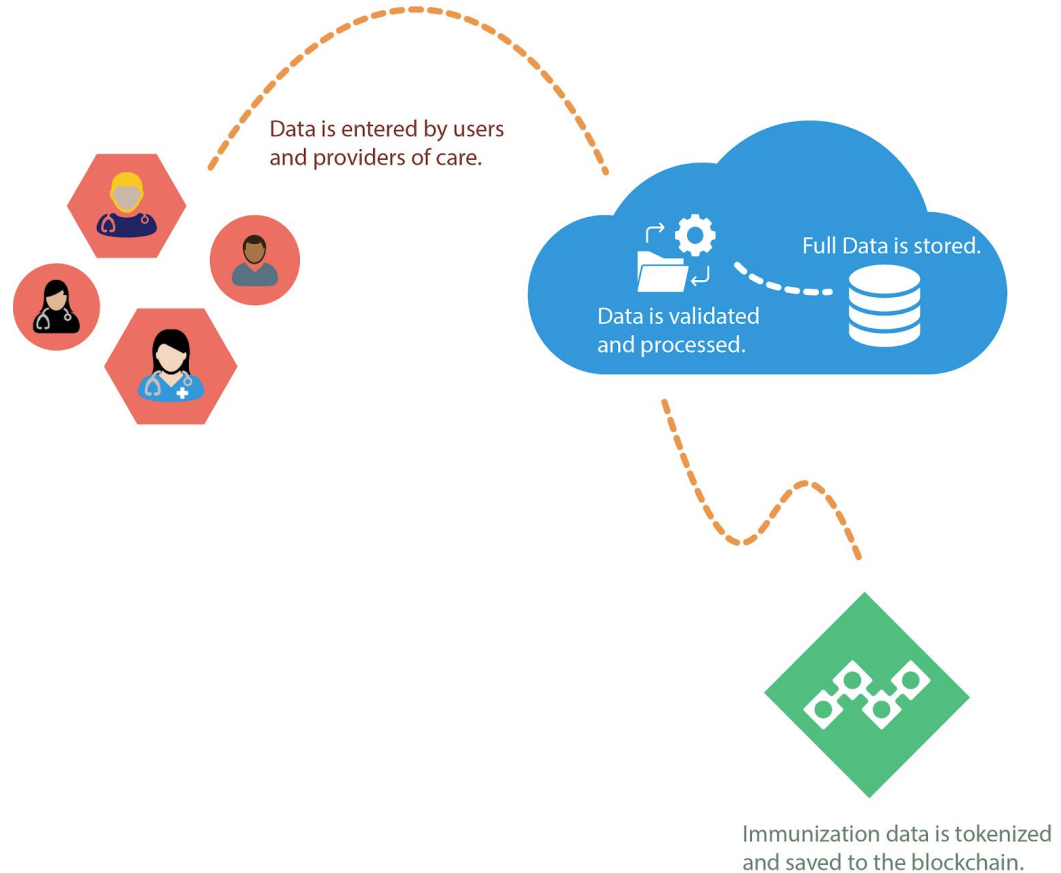
0xc96e6b8cca07e7c8d903b29233b72a046303886f1737aefda278d0b9d71b6649

Submit

Verifier	Patient	Vaccination	Recommended schedule	Vaccination date	Verified on
Doctor Who	Peter Parker	Measles, mumps, rubella and varicella vaccine	12 months; 18 months to 4-6 years;	27-10-2020, 15:21:58.792	27-10-2020, 15:22:18.837

# Technical Overview

- The architecture allows for private and **personal information** to remain “off-chain”
- Only data that **does not contain** any **personal information** is kept on blockchain (i.e. **on-chain**)
- The on-chain data is fully tokenized and also **completely encrypted**
- Data maintained internally (i.e. off-chain) is also **encrypted**





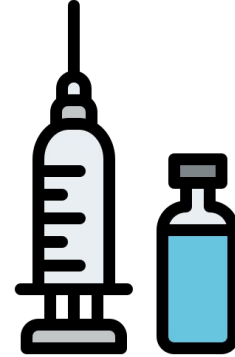
# Market



Over 10,000 pharmacies  
across Canada



Serving 17M Canadian  
0-19 Year: 8M  
>60 year: 9M



1-3 shots a year @ \$100  
per shot

Vaccination Market \$2-5 Billion

# Who Will Pay?

- Yello enables pharmacies to track and administer vaccinations to patients
- Pharmacies make 20-30% markup per vaccination or \$17-\$36 gross profit, on the average \$100 vaccine.
- For 30,000 vaccinations this is \$1M in gross profit
- At 100,000 vaccinations at \$10 per transaction, Yello would realize \$1M in revenue



# If You Fund Us...

## >>Version 0.01

- Integration to the pharmacy system / Electronic Health Record Systems
- Build out automated reminder and scheduler
- Portal for user to provide certification of vaccinations

## Expression of interest:

- Opportunity to present to the Red Cross of Canada
- Test clinic confirmed

Thank you

# Appendix

# PLexity's History

- **From Jan 2018 to May 2019:**
  - Project conception
  - Market research
  - Worked with the eHealth Center of Excellence to develop proof of concept. Focus was eReferral
  - Specification only, no development
  - Project fell through due to funding limitations and change in government
- **September 2019- March 2020:**
  - Revisited idea, decided to focus on vaccination
  - Support from Ryerson University to build prototype
  - Developed specification/ application prototype (MVP)
  - Project stop due to time constraint of the team
- **October 2020 - Present:**
  - Entered Blockhack
  - Focused on redevelopment of the business opportunity
  - Market research: Connecting with individuals within the healthcare space to understand the revenue model and what the motivation of care providers would be to use this application
  - Creating a series of advisors to help navigate the healthcare landscape
  - Update of the app

# Why Vaccination?

**Pilot:** Digitalization of the vaccination record (**Yellow Card**) on blockchain

## Objectives:

- Demonstrate how blockchain technology can be leveraged to support healthcare providers and citizens' needs in terms of **security, accessibility, and interoperability**
- Understand the **adoption challenges** (e.g. integration, policy) and change management aspects
- Build a **foundation** that can be extended to support additional **health information, stakeholders** and **healthcare processes**

# Vaccination Exploration Scenario

## Currently being explored

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### Scenarios:

- Physician / Pharmacist wishes to review individual's vaccination record
- Physician / Pharmacist registers a new vaccination event record for the individual
- Patient has the ability to share record with providers.

## Future Phase

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### Identity:

- Physician / Pharmacist identity allows digital access to authorized portions of individual's data
- Identity also registers new vaccination event records as “authorized” or “valid”, assuming the Provider has previously registered with the PLeXity Healthchain.

### Authorization:

- Individual / Guardian authorizes access to vaccination history, or some portion of that history

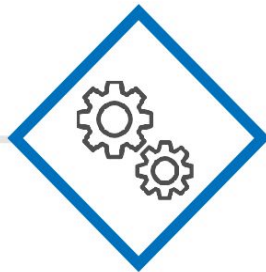


# 5-Year Roadmap



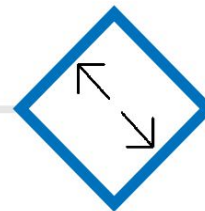
## 12 Months

- Focus on vaccination record
- Develop Proof of Concept (PoC) for the vaccination Record using blockchain
- Include the authentication of users and providers
- Test and validate in Limited Pilot release



## 12-18 Months

- Move to production for vaccination record
- Expand across Ontario
- Explore other components of the PHR: lab, drug, diagnostic imaging, and clinical health information
- Develop data structure for predictive health capabilities (analytics, predictive diagnostic, analysis of blood work, genomics)



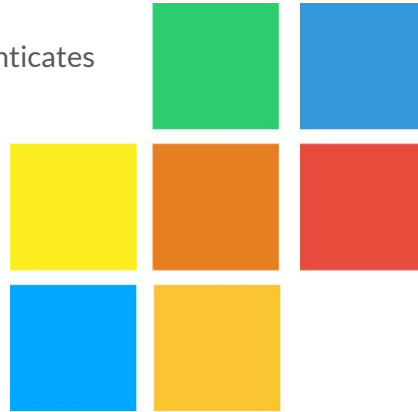
## 18-60 Months

- Continue to build user base
- Begin to build AI modules
- Introduction of remote monitoring/diagnostics through IoT technologies
- Ability for individuals to volunteer for trials (e.g. cryptocurrency based)

# PLexity Building Blocks

## PHR

- Development of a “Personal” Health Record (PHR) accessible at any point of care.
- Provide secure linkage that authenticates healthcare providers and users.



## Monitoring

Promote self monitoring and independent care through IoT devices.

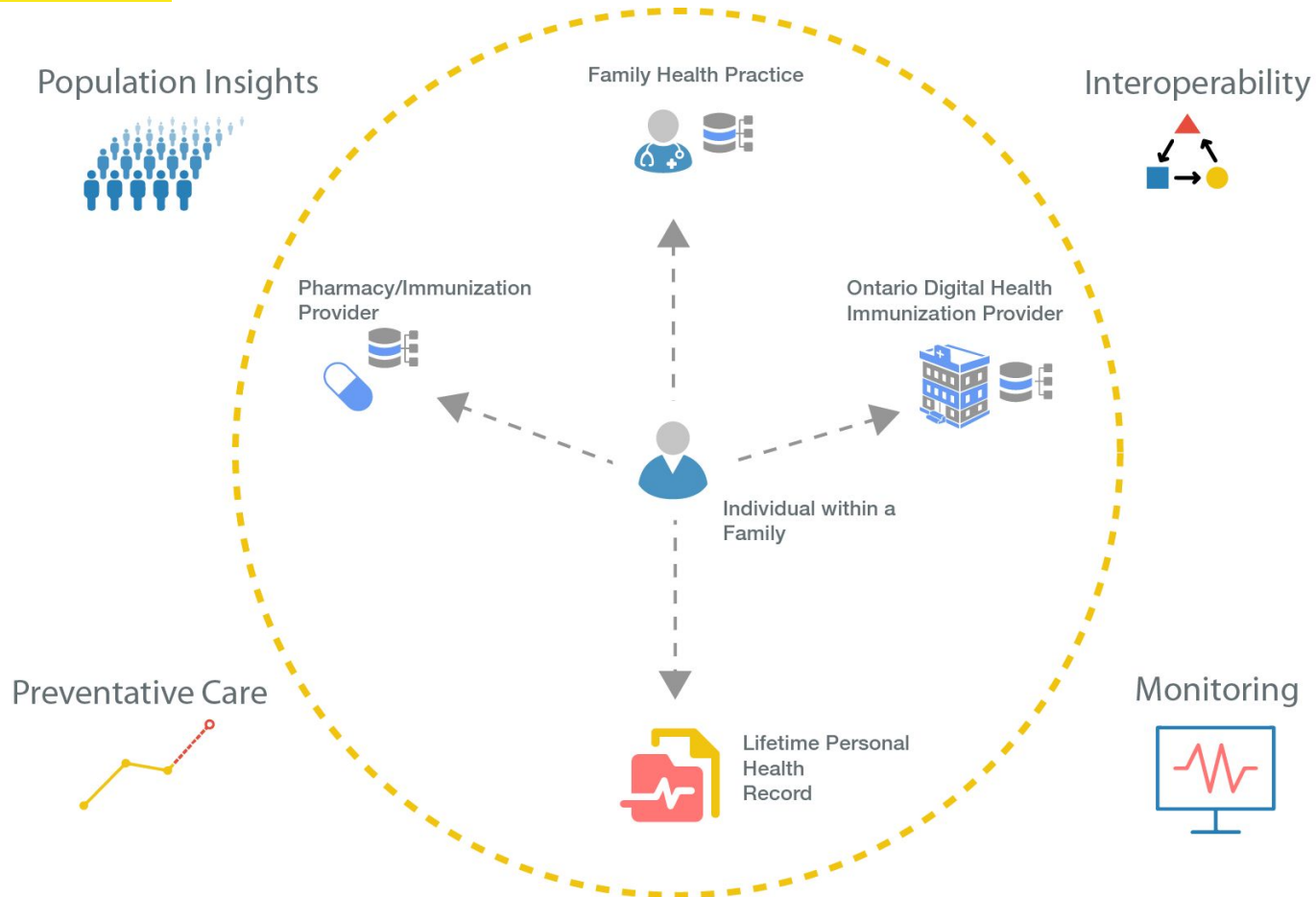
## Predictive

Leveraging AI and Machine Learning to empower/self- promote personal care and wellness

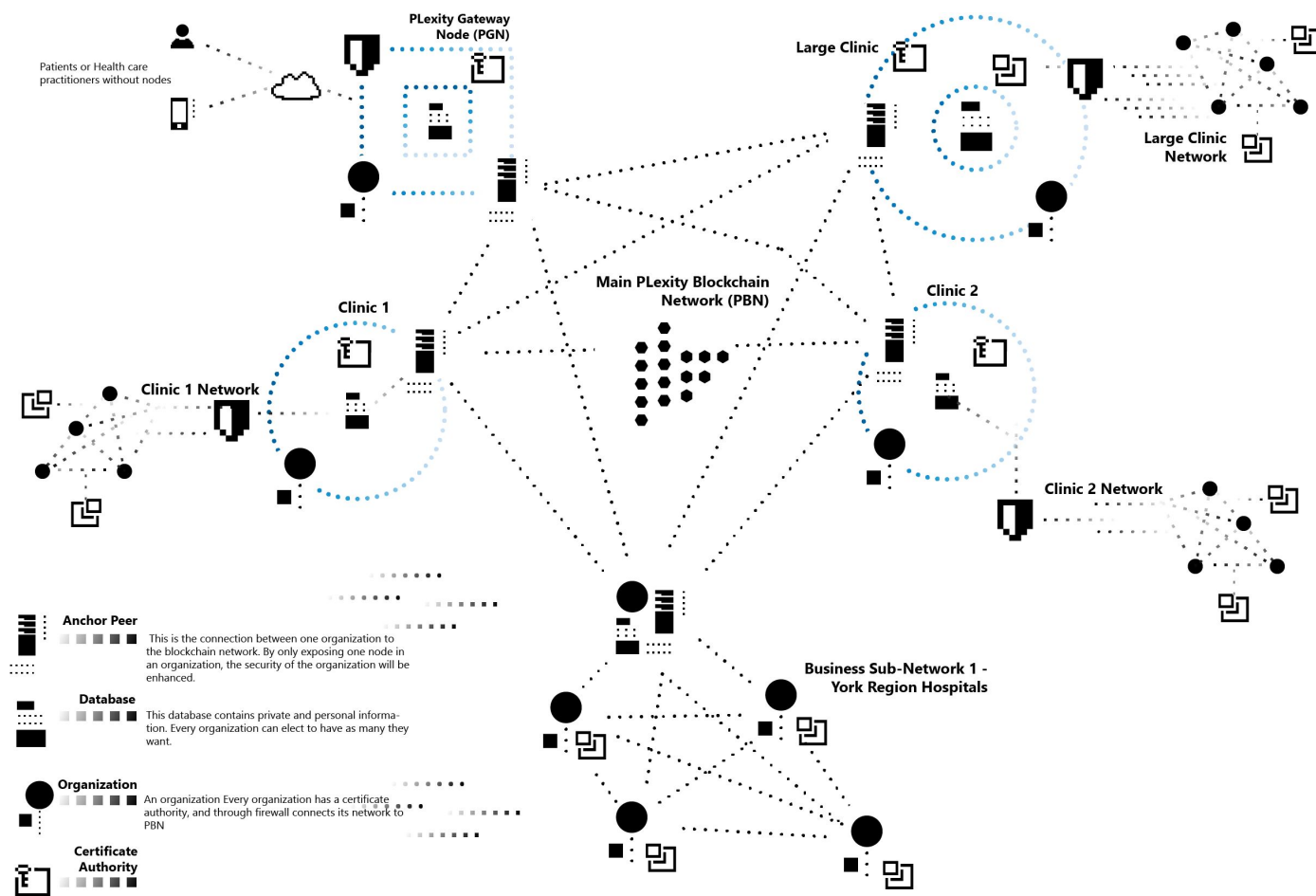
**Mission**>> *The creation of a user empowered personal health record that is verifiable and secure at any point of care*

**Vision** >> *Empowering the wellbeing of people*

# Future Vision



# Future Vision - Decentralized Health Network



The development of a **decentralized patient record** accessible at any point of care

# Why Blockchain?

Blockchain is a **secure** and **private** means of **connecting** multiple diversses and health system stakeholders together to support their interactions and collaboration.

A **secure, lifetime health record** that can be carefully shared by patients and health service providers

**Trusted transactions** across the health system that enable the appropriate use and value of the patient's health record in the care process



**Secure authentication** and **identity management** to ensure the right people have access to the right information to support patient care, while maintaining privacy

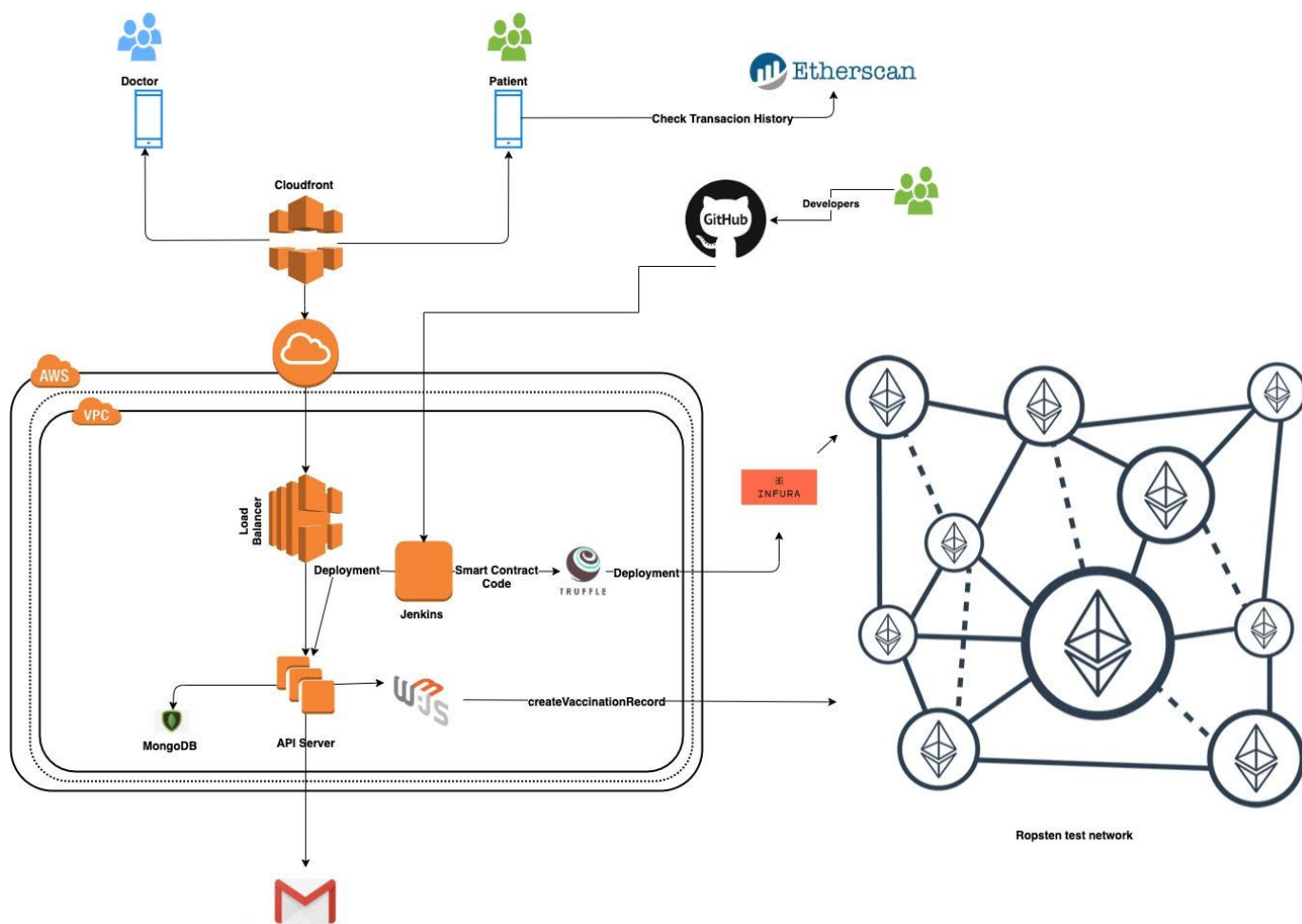
**Interoperability** across a diverse stakeholder and technology landscape to facilitate collaboration and flexibly "connect" across the health system.

# Privacy

- Privacy issues are implicated as the proposed solution involves the access, use and transmission of personal health information of patients
- The solution will require legal authority under the *Personal Health Information Protection Act* (Ontario) and equivalent legislations in other provinces
- The PLexity team is consulting privacy lawyers to identify the necessary authority and resolve privacy issues

# Details - Technical

- Developed with React Native
- Uses MongoDB to save users
- Hosted in AWS
- Transactions are sent to the Ropsten Ethereum test network



# Details - Market

Province	Pharmacies	0 to 19 years	> 60 years	Total
Ontario	4,566	3,131,022	3,555,601	6,686,623
Quebec	1,907	1,780,056	2,310,609	4,090,665
Alberta	1,457	1,080,018	875,313	1,955,331
British Columbia	1,368	991,471	1,347,086	2,338,557
Other Prov & Terr	1,626	1,156,945	1,307,498	2,464,443
<b>Total Market</b>	<b>10,924</b>	<b>8,139,512</b>	<b>9,396,107</b>	<b>17,535,619</b>

Population	Cost per shot	Total Revenue
17,535,619	\$100	\$1,753,561,900
17,535,619	\$200	\$3,507,123,800
17,535,619	\$300	\$5,260,685,700

Sale Price	Mark up	Gross Profit	Mark up	Gross Profit
Price of shot	20%	20%	30%	30%
\$100	\$83	\$17	\$64	\$36
\$200	\$167	\$33	\$128	\$72
\$300	\$250	\$50	\$192	\$108



# Revenue Table

Per Vaccination	Pharmacy's gross profit from vaccination @\$36 per transaction	Yello Revenue \$5 per transaction	Yello Revenue \$10 per transaction	Yello Revenue \$15 per transaction
500	\$17,949	\$2,500	\$5,000	\$7,500
1,000	\$35,897	\$5,000	\$10,000	\$15,000
3,000	\$107,692	\$15,000	\$30,000	\$45,000
5,000	\$179,487	\$25,000	\$50,000	\$75,000
10,000	\$358,974	\$50,000	\$100,000	\$150,000
15,000	\$538,462	\$75,000	\$150,000	\$225,000
30,000	\$1,076,923	\$150,000	\$300,000	\$450,000
60,000	\$2,153,846	\$300,000	\$600,000	<b>\$900,000</b>
120,000	\$4,307,692	\$600,000	<b>\$1,200,000</b>	\$1,800,000
240,000	\$8,615,385	<b>\$1,200,000</b>	\$2,400,000	\$3,600,000

## Assumption Average vaccination

Price: \$100

Cost: \$64

Gross Profit:  $\$100 - \$64 = \$36$