**Supporting Details on OP Medicine for RetroPGF3 proposal**

**Summary**: Developer tools to enable visualization, management for developers to build solutions in medicine, healthcare, improve transparency in drug testing with Filecoin, Ethereum, Optimism, Embark and EtherCalc. We wish to engineer an eco-system for Optimism developers, full stack builders, smart contract designers, unit testers, performance engineers for the OP Medicine developer tool. Eco-system Goals:

1. To make Optimism Medicine project freely and readily available to developers, Optimism learners;

2. To explore and share best practices;

3. To provide a forum for discussion and support for OP Medicine for collaboration, contribution;

4. To provide a mechanism for evaluation and dissemination of developer efforts.

**How OP Medicine works:**

We are developing an Optimism NFT marketplace for DICOM images to enable research organizations and radiologists. This enables improving Data Transparency in Drug Testing and early-stage detection and prevention of community diseases.We also wish to scale our efforts to develop secure, transparent Drug Testing Pipeline and improving Data Transparency in Drug Testing using OP stack.Our OP solution enables medical trial testing and clinical trials via EMTTRs (Electronic Medicine Trial and Test Records as a Service) and EHR and Radiology services on the decentralized cloud using OP Stack.Vision and Goals: Enabling the bottom of pyramid through empowering pharma companies and the medical eco-system to do medicine trial testing and clinical trials via Ethereum and Optimism blockchain enabled EMTTRs (Electronic Medicine Trial and Test Records as a Service), EHR and Radiology services.

EMTTRs as a service aims at providing

■Secure data storage, transparent data movement and data authenticity;

■Improving Data Transparency in Drug Testing using Optimism, Ethereum;

■Enabling the healthcare community by empowering pharma companies & the medical ecosystem to do medicine trial testing securely, transparently using Optimism, Ethereum.

Healthcare Ecosystem Benefits of the OP Medicine Developer Tool:

a. Patients

1. Make instant appointments with a doctor and get quick access to e-records using bulk query and retrieval via Orthanc PACS, Optimism network.

2. Computer-aided detection will help in early prediction and diagnosis of diseases.

b. Doctors and Hospitals

1. Prioritize and handle appointments better.

2. Issue prescriptions using EtherCalc medical suite dapp.

3. Coordinate with specialists using Medical DAOs tooling.

4. Access to accurate records using medical history dapp.

5. Improved care.

6. Better dietary feedback based on genomelink API

c. Administrator and Insurers

1. Connect all stakeholders using Optimism network.

2. Personalize care treatment.

3. Accurate and timely payments.

4. Reduce the cost of decentralized systems by Layer 2 Scaling.

d. Employees

1. Administer Benefit using IPFS, Ethereum, Optimism network

2. Reduce healthcare costs.

3. Reward employees

4. Offer affordable benefit packages.

5. Better diet and food programs at offices.

e. Research Institutions

1. Computer-aided detection of diseases and development of prevention models using DAOs.

2. Personalized medicine and drug discovery practice using Ethereum and Optimism Network.

**Github Repository of OP Medicine**: https://github.com/aspiringsecurity/EMTTR

**Website for Civic Bodies**: https://sites.google.com/view/emttrservice/home

**Twitter**: https://twitter.com/OP\_medicine\_DAO (recent page);

https://twitter.com/manusheel (OSS Collaboration);

Community Engagement: https://twitter.com/encodeclub/status/1620777000997916673

**Youtube Channel**: https://www.youtube.com/channel/UCigU\_PpCCLimKxIHsSf5EvQ

**Screencast:** https://youtu.be/BUiVvhuUdrE (dapp, security), https://youtu.be/BUiVvhuUdrE (dapp, portal).

**Community Initiative for running OP hackathons and pre-incubation programs in healthcare and mobility with Government authorities in New Delhi, India**: https://sites.google.com/view/nsutiif/home , https://sites.google.com/view/departmentofdesign/student-glimpse?authuser=0

**Research Profile**: https://www.researchgate.net/profile/Manu-Gupta-6 ; https://dblp.org/pid/83/8804.html

Recent Publication: https://onlinelibrary.wiley.com/doi/epdf/10.1002/hbe2.240

Linkedin: https://www.linkedin.com/in/manusheelgupta/

Other relevant links: https://www.youtube.com/watch?v=aIq3JiTlNVA&t=3s

Github Repository of OP Medicine: https://github.com/aspiringsecurity/EMTTR

Website: https://sites.google.com/view/emttrservice/home

Screencast: https://youtu.be/BUiVvhuUdrE (dapp, security), https://youtu.be/BUiVvhuUdrE (dapp, portal).

Github Repository of Medical Counselor: https://github.com/aspiringsecurity/Medical-Counselor

Website: https://sites.google.com/view/electronichealthrecords/home

Github Repository of Medical DAO: https://github.com/seetadev/FEVM-Med

Website: https://sites.google.com/view/fevm-med

**OP Medicine Builder Ecosystem**

Manu Sheel Gupta

Contact Information: discord: manusheel#3075

Email: manu@seeta.in, aspiring.investments@gmail.com

Github: https://github.com/seetadev, https://github.com/aspiringsecurity (organization)

Twitter: https://twitter.com/manusheel

Telegram: @manusheel

Deepti Gupta (Full Stack Blockchain Developer, Discord: deeptigupta#4290, Email: deepti.kotwal.2011@gmail.com),

Vibhor Bijoy (Security Engineer, Email: bijoy.vibhor19@gmail.com),

Praveen Patel (Data and Logistics Executive, Email: android.seeta.dev@gmail.com),

Usha Gupta (Consultant for UI/UX, seeta.team@gmail.com),

Dr MPS Bhatia (Consultant, Partnerships and Technology, aspiringuserapps@gmail.com),

Arvind Kumar Gupta (Business Executive, arvindsenior@gmail.com),

Vithika Gupta (iot and blockchain adviser, aspiringworkapps@gmail.com),

Rakhee (Test Engineer, financeseeta@gmail.com)

**Relevant usage metrics**

- Total number of dataset transactions specific to X Ray modality: 160,000;

- Total number of addresses: 20;

- Number of addresses on Optimism: 6;

- Plan for total number of dataset transactions specific to X Ray Modality on Optimism: 130,000;

- Total number of dataset transactions specific to CT Scan, MRI and Nuclear Medicine: 30,000

**Collaborators:**

**- Covid Care Center, Delhi** (https://sites.google.com/nsut.ac.in/nsutcovidcarecentre/home?authuser=0) and Code 4 Gov Tech (<https://www.codeforgovtech.in/>)

**- Rajshri Medical College and Hospital, Uttar Pradesh (India);**

- **Diagnosity (diagnostic labs in Noida and Delhi.** They have agreed to contribute anonymized datasets and open source machine learning tools that will enable Optimism developers, researchers and data scientists in their efforts to use AI models for developing solutions for early detection and prevention of diseases.)

- Eka.care (https://www.eka.care/) Used by 30 million South Asians primarily in India.

- **Zurich Friends of Haskell (https://zfoh.ch/ and https://zfoh.ch/zurihac2020/projects.html), Haskellerz**;

- **NSUT Optimism Initiative** (https://sites.google.com/view/nsutiif/home) and **My Kids NFT** project (https://www.youtube.com/watch?v=jOn5-ZPhqi8 and https://github.com/i-am-Pony/MyKidsNFT\_Project);

- **Design Department, NSUT** (https://sites.google.com/view/departmentofdesign/student-glimpse?authuser=0 ), Management Studies Department, NSUT (http://www.nsit.ac.in/divisions/mg/dept\_mg\_workshops/), NSUT IIF (http://nsut.ac.in/nsutiif/);

- **Sugar Labs** (https://www.sugarlabs.org/) and Google Summer of Code Program - Sugar Labs;

- **OLPC** (https://laptop.org/), Open Government Data, India (https://data.gov.in/);

- **Samsung Labs at NSUT** (https://developer.samsung.com/);

- **AWS Customer Council and Activate Program** (https://developer.amazon.com/);

**What is the problem statement OP Medicine hopes to solve for the Optimism ecosystem?**

Given its size and prominence, pharma and drug research organizations seek to always be guarded against information security threats—from both external and internal actors. This means that they are required to sift through billions of events generated by network devices, endpoint solutions, and enterprise software. Collecting and aggregating EHR is a complex activity for drug design, development. Further, there is a key need for collaboration between developers and subject matter experts, who can engage and design solutions collaboratively. The problem this proposal hopes to solve for the Optimism eco-system is towards engaging developers to build collaborative solutions along with doctors and public health care experts on Optimism blockchain utilizing Web3 eco-system tools, ZK proof systems, sharding and soul-bonding ID. Further, we wish to encourage developers to develop key procedures and practices on maintainability, unit testing and security of project code on Optimism blockchain.

**How does OP Medicine offer a value proposition solving the above problem?**

Our solution enables the bottom of pyramid and empowers the developer community through collaboration with radiology and research labs, pharma companies and the medical eco-system to do medicine trial testing and clinical trials via Ethereum and Optimism blockchain enabled EMTTRs (Electronic Medicine Trial and Test Records as a Service), EHR and Radiology services. EMTTRs on Optimism as a service aims at providing

■Secure data storage, transparent data movement and data authenticity.

■Improving Data Transparency in Drug Testing

■Enabling healthcare community by empowering pharma companies & the medical eco-system to do medicine trial testing securely, transparently

We enable the developer community to share ideas collaboratively with medical experts via the builder events on Optimism, develop healthcare project blueprints and design, and organize information and content through videos, audio, images and blogs; engage non-profit organizations in innovation around healthcare and government agencies.

We also invite them to localize and internationalize a Web3 developer library for electronic health records as a service to enable secure data storage, transparent data movement, and data authenticity via these builder events on Optimism: The model is based on the three ‘C’s of “collaboration, which is about working together at one place; community, when people work together, they form communities; and cooperation, which is essential for any particular project.

**Why is OP Medicine a source of growth for the Optimism ecosystem?:**

We are engineering an ecosystem for Optimism developers to build an Optimism NFT marketplace for DICOM images to enable research organizations and radiologists. This enables improving Data Transparency in Drug Testing and early-stage detection and prevention of community diseases and also enable the Optimism eco-system to impact the bottom of the pyramid via open source community contribution and incentives.

We also wish to scale our efforts to develop secure, transparent Drug Testing Pipeline and improving Data Transparency in Drug Testing using OP stack.Our OP solution enables medical trial testing and clinical trials via EMTTRs (Electronic Medicine Trial and Test Records as a Service) and EHR and Radiology services on the decentralized cloud using OP Stack.We are also enabling the development for EHR as a service using OP stack for scaling collaboration of DICOM data in EMTTR.

We will help to drive the growth of Optimism in a number of metrics:The number of Web3 developers and users on boarded to OptimismThe number of Web3 developers and users investing in OP and other health projects built on OptimismThe number of users utilizing medical services on OptimismIncrease in on-chain volume

**Developer Innovation in Optimism ecosystem:**

- New policy designs and models to harvest tokens in a DAO-driven **decentralize** compute fabric.

- Decentralized NFT-based voting system for community contribution and development on OP Medicine.

- Optimism Workflow for engaging developers: Developers create a patch request for improving community tooling on OP Medicine (Optimism project); Developers can join that patch request by minting an NFT of that RFP. This NFT is created on Optimism.

**Other Co-incentives for OP Medicine Builders**

Wish to share that we are awarding a $400 Linux laptop to the top contributors in our project. We will also be providing bootable educational pen drives on healthcare and medicine to our OP users.

We have received 12 of such laptop devices and flash drives via grants from OLPC, Boston University and Sugar Labs. Further, we will share with them key research papers and articles authored by us to enable them to utilize our services collaboratively.

The good developer proposals in OP medicine are pre-incubated (in-house as well as virtually) and supported via funds and grants from NSUT IIF (https://sites.google.com/view/nsutiif/home and <https://sites.google.com/view/departmentofdesign/student-glimpse?authuser=0>).

DTTE and AICTE in India will fund these proposals via the Yukti portal (https://yukti.mic.gov.in/) and SIH (https://www.aicte-india.org/Initiatives/smart-india-hackathon).

There are 3 key platform features that will enable better retention of incentivized users and liquidity on Optimism post the grant period.

■Secure data storage, transparent data movement, and data authenticity.

■Enabling the healthcare community by empowering pharma companies & the medical eco-system to do medicine trial testing securely, transparently

■Improving Data Transparency in Drug TestingWe also wish to share that we will foster community partnerships with the Ministry of Healthcare in India; utilize the scalability of Optimistic roll-ups to enable better outreach to citizens in reference to electronic health records as a service.

We are collaborating with government advisers in India and will sustain the efforts by providing government incentives on maintaining the developer tool to enable tabulation, computation, visualization, and data management for developers to build solutions for the bottom of the pyramid in the areas of healthcare using Optimism.

**Notable achievements for OP Medicine**:

1. Optimism Runner Up at Encode Metaverse Hackathon 2022: please visit https://medium.com/encode-club/metaverse-hackathon-prizewinners-and-summary-5d12353cc214 and https://www.youtube.com/watch?v=aIq3JiTlNVA&t=1s

2. Filecoin winner at Chainlink Fall hackathon 2022 (https://devpost.com/software/electronic-medicine-trial-and-test-records-as-a-service),

3. EVM Ideathon Runner-Up 2022 (Government and Public)

4. Tableland and NFTPort winner at HackFS 2022: https://ethglobal.com/showcase/etherglance-cjro9

5. Young Scientist Award in Healthcare to Manu and Deepti at India International Science Festival

6. Scholarship at ZuriHac for Haskellers, Rapperswil, Switzerland and SAP-GITR, India winner

**Other OP ecosystem Projects**

1. Drone Monitor for Healthcare, Emergency Services (https://github.com/aspiringsecurity/Water-ICM);

- Optimism Finalist at Encode Metaverse Hackathon 2022 (UAV Monitor)

- Website: https://sites.google.com/view/latcglobal/home

- Application for Logistics, Maintenance companies: - https://sites.google.com/view/dronesforrealestate/home

- Application for End Consumers, Civic bodies: https://sites.google.com/view/integratedwatermanagment/home

- We won the Aptos Challenge (5000 USDC) at Encode's Next Video Build Hackathon: https://www.encode.club/next-video-build. Please find the finale and prize giving video: https://www.youtube.com/watch?v=2USgb11kYzY and blog entry at https://medium.com/encode-club/next-video-build-hackathon-prizewinners-and-summary-33f258fdc9f5

- Covalent Prize Winner at Encode Harmony Hackathon 2022 (https://medium.com/encode-club/encode-club-x-harmony-hackathon-prizewinners-and-summary-e088485c8af7;

Github Repository: https://github.com/seetadev/EthOps)

- XMTP and Filecoin Pool Prize at Moralis Filecoin Hackathon 2022 (please visit https://moralis.io/filecoin-hackathon/winners/)

- We won the best use of Hedera Hashgraph at the Garuda 3.0 Hackathon. Please find the winner's certificate at https://drive.google.com/drive/u/3/folders/1l9ZG65js2Q-a1m8Iy3BO25dWISqr3oPk (merit certificate directory) and winner's link at https://garuda-hacks-3-0.devpost.com/project-gallery

-Top 20 Innovations by Niti Aayog team at a Mobility Summit in Vigyan Bhawan, New Delhi

2. Transport Monitor: Technical solution for citizens, police officers and drivers to report and manage incidents, detect and prevent accidents on web and mobile.

- Filecoin Microgrant Recipient 2023: https://github.com/ipfs/devgrants/

- Eth Transport (Hall of Fame URL: Please search for Eth Transport at https://airtable.com/shr2xqq48PEHWzSBu/tblCwc1GeUbvwVrmU );

- Github: https://github.com/aspiringsecurity/EthTransport

- Project Information: https://sites.google.com/view/aspiring-road-safety/home

- Dev Grant/Prize Winner at Tron Hackathon ($12.5K USD), Near MetaBuild Hackathon ($20K USD) and Polygon winner at Chainlink, Ethglobal Hackathons, Conduent Finalist.

- Fluence Best Use Case Winner, XMTP and Filecoin Pool Prize, Ledger Nano Prize at Moralis Filecoin Hackathon 2022 (please visit https://moralis.io/filecoin-hackathon/winners/)

- Harmony Prize Winner at Encode Harmony Hackathon 2022 (https://medium.com/encode-club/encode-club-x-harmony-hackathon-prizewinners-and-summary-e088485c8af7)

3.SocialCalc for Public Health and Education: Please visit http://activities.sugarlabs.org/en-US/sugar/addon/4084

- Number of users: 800,000 from OLPC deployments and 45,000 from downloads.

- Guide for using Charting tools by Harvard University's Digital Literacy Project - http://vimeo.com/11886029

- Plan Ceibal OLPC Deployment Project, Uruguay - http://www.youtube.com/watch?v=-7cPHg4XJKY

- Video by OLPC France Community member - http://vimeo.com/5291250

- Guide for using Charting Tools - http://wiki.laptop.org/go/User:Ndoiron/SocialCalc

4. SocialCalc for improving social access to data and calculation at Federal Communication Commission (FCC): https://www.purplemotes.net/2009/09/13/universal-social-access-to-data-and-calculation/

5. Community Publications on SocialCalc

# Publications

- "Collaborating Towards Learning, Using Social Spreadsheets for Health Education and Community Awareness", Aastha Chhabra, Manu Sheel Gupta, Sixth International Conference of MIT’s Learning International Networks Consortium (LINC), MIT, Cambridge, Massachusetts, USA · Jun 16, 2013

- "Spreadsheet on Cloud - Framework for Learning and Health Management System", K.S. Preeti, Vijit Singh, Sushant Bhatia, Ekansh Preet Singh, Manu Sheel Gupta, Proceedings of the EuSpRIG Conference 2011 "Spreadsheet Governance - Policy and Practice" ISBN : 978-0-9566256-9-4

- "Constructionist Learning using Spreadsheet Based Models on Tablets", Mithil Gupta, Manu Sheel Gupta, Sixth International Conference of MIT’s Learning International Networks Consortium (LINC), MIT, Cambridge, Massachusetts, USA · Jun 16, 2013

- "A Synchronized Spreadsheet Framework as an IT solution and its Data Management Issues" Rohit Jain, KS Preeti, Vijit Singh, Shubham Shukla, Sushant Bhatia, Yatharth Bansal, Manu Sheel Gupta, International Conference on Information Technology, Systems and Management, Indian Institute of Management, Kozhikode, India · Dec 17, 2011

- "SocialCalc: A Spreadsheet Activity for Computer Supported Collaborative Learning", Manu Sheel Gupta, K.S. Preeti, Vijit Singh, Proceedings of the 2010 Conference on Frontiers in Education: Computer Science and Computer Engineering, FECS 2010, Las Vegas, Nevada, U.S.A., CSREA Press 2010, ISBN 1-60132-143-0, pp. 304-309 URL - http://www.informatik.uni-trier.de/~ley/db/conf/fecs/fecs2010.html

- "Implementation of Private Cloud Computing using Integration of JavaScript and Python", K.S. Preeti, Vijit Singh, Manu Sheel Gupta, The Python Papers Monograph, The PyCon Asia Pacific 2010, Singapore Management University Download URL - http://ojs.pythonpapers.org/index.php/tppm/article/view/149/161

- SocialCalc project has also been covered in important sections of the following conference papers -

- "A March Towards Constructionism based on Storytelling, Gaming and Collaboration", Manu Sheel Gupta, Vijit Singh, Manjot Pahwa, The Fifth International Conference of Learning International Networks Consortium (LINC) 2010, Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A.

- "Collaborating Towards Learning: Using Web 2.0 for Educational Idea Development", Krittika Adhikary, Manu Sheel Gupta, Ekansh Preet Singh, Swarandeep Singh, The Fifth International Conference of Learning International Networks Consortium (LINC) 2010, Massachusetts Institute of Technology, Cambridge, Massachusetts, U.S.A.

6. Recent research contribution: Co-author of the article, "Opinion of students on online education during the Covid 19 pandemic", please visit the paper at https://onlinelibrary.wiley.com/doi/epdf/10.1002/hbe2.240

7. Sugar Labs (https://www.sugarlabs.org/) and One Laptop Per Child: https://laptop.org/

- Co-author, SocialCalc (http://activities.sugarlabs.org/en-US/sugar/addon/4084); Notable OSS Release: http://www.olpcnews.com/software/applications/socialcalc\_on\_sugar\_version\_5.html

- Platform for Developers around Ideas and OSS applications: https://www.livemint.com/Industry/RXejxSDBL1x0KQQCJywU3K/Platform-aims-to-build-communities-around-ideas.html

- Sugar on Ubuntu and Debian OS: https://bugs.launchpad.net/ubuntu/+source/sugar-0.88/+bug/617813

- Co-author, Read Activity: ebook reader on Sugar environment (https://github.com/sugarlabs/read-activity)

- Contributor, Food Force 2 game: <http://www.pygame.org/project-Foodforce2-1122-2375.html>

**Platform for Developers around Ideas and OSS applications**: https://www.livemint.com/Industry/RXejxSDBL1x0KQQCJywU3K/Platform-aims-to-build-communities-around-ideas.html