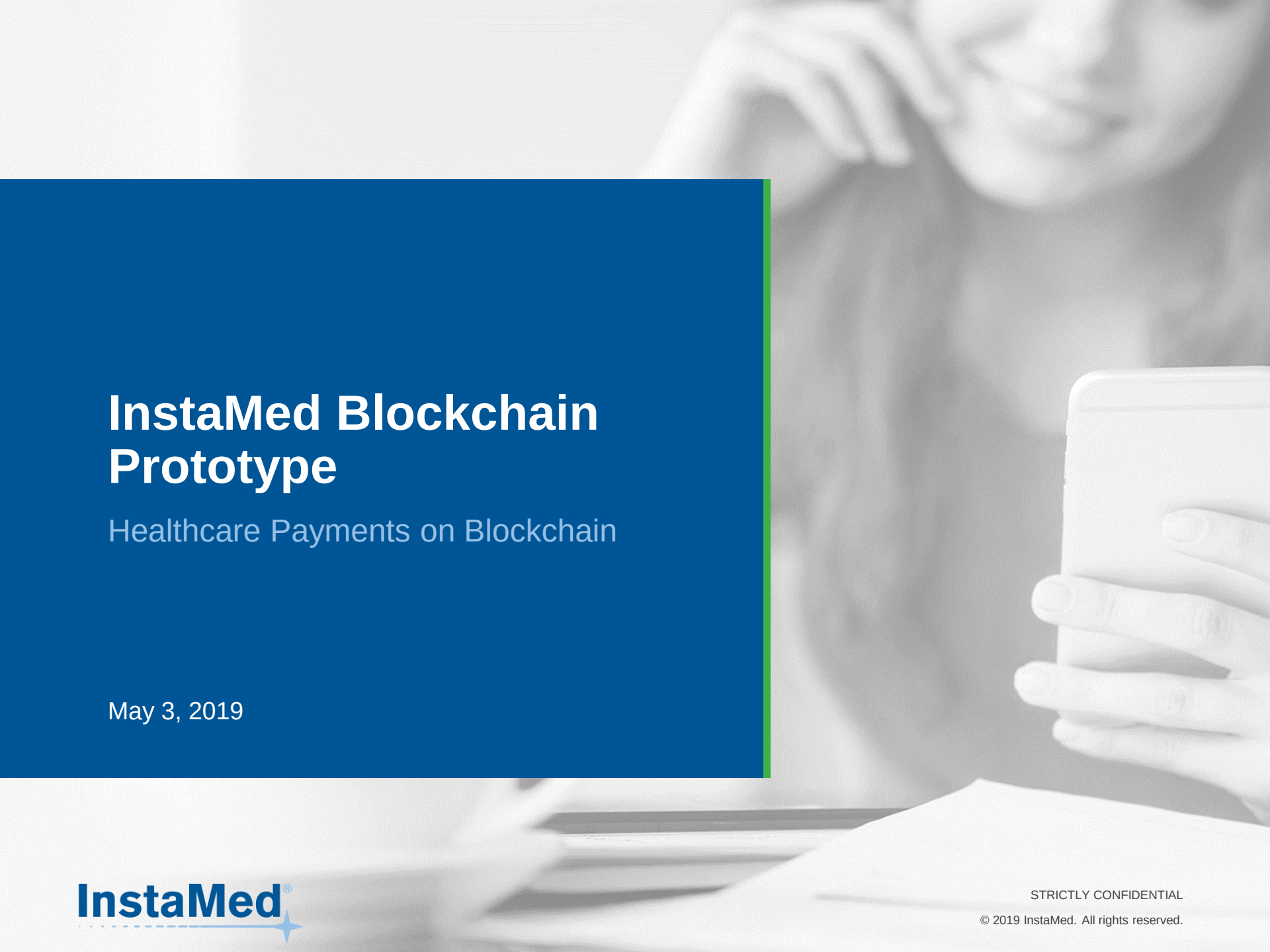

InstaMed Blockchain Prototype

Healthcare Payments on Blockchain

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InstaMed®

Presenter

Brian Bentow

Head of Innovation

InstaMed

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Real Life True Story – Short Version

Steve is rushed to the hospital in an ambulance after his doctor finds that his coronary artery is 98 percent clogged. Over the next three to six months, Steve receives a stack of paper bills from the ambulance, surgeon, surgery center and several other business entities. He half kiddingly says that dealing with the billing was almost worse than the heart attack experience itself.

Healthcare Stakeholders

- **Patients** are confused by the statements that they receive and are frustrated that they have to manage logins to different provider portals and follow different payment processes.
- **Providers** have to send three statements on average per patient bill in order to collect patient responsibility which is slow and expensive.
- **Payers** want an easy way for their members to view their balances and pay their responsibility.

Thought Experiment

- What would a system look like in order to deliver a seamless payment experience for Steve given that the hospital employs independent contractors and the facilities are part of a separate business entity?

About InstaMed

- Healthcare payments network connecting providers, payers and consumers across the U.S.
- Founded in 2004 by Chris Seib (CTO) and Bill Marvin (CEO)
- Focuses on simplifying healthcare payments
- Integrates with both provider and payer healthcare IT systems
- Delivers consumer payment solutions for patients and members

Objectives for Blockchain Prototype

- Assess the viability of using blockchain in healthcare payments by implementing a technical proof of concept that handles authentication, authorization, privacy and transaction processing

Project Philosophy

- Open collaboration with a diverse set of industry stakeholders
- Interoperability through open standards and open source
- Focus on the financial workflows
- Privacy and security
- Learn as much as we can

Prototype Technology Stack

- Hyperledger Fabric with Node JS SDK
- Convector
- FHIR v4 Financial Management Workflow
- VueJs
- Forma

Why Hyperledger Fabric

- Supports rapid prototyping using the Composer tool
- Open source and open governance
- Linux foundation based
- Modular and flexible
- Large community

Why Convector

- Enterprise MVC software development (typescript/compilation, models with attributes, controllers, unit tests, etc.)
- Open source/Hyperledger labs project
- Great documentation including tutorials for migrating a Composer based application to Convector
- Thin wrapper on top of Node JS SDK with access to other NodeJS libraries

Why HL7 FHIR v4

- FHIR is a standard for healthcare data exchange, published by HL7 that supports both clinical and financial management workflows and resources
- Aligned with our philosophy of interoperability (open standards)
- Active community with momentum

Why Forma for Hosting

- Multi-cloud infrastructure orchestrator for Hyperledger Fabric (and soon other blockchain)
- No cloud provider lock-in
- Each participant will be able to handle their own infrastructure on their preferred cloud provider (or private clouds)
- Start fast
- Connects to Kubernetes layers making its installed components portable
- Abstracted from Hyperledger Fabric code

Architecture

BLOCKCHAIN LAYER - HYPERLEDGER FABRIC	BACKEND / SMART CONTRACT API	CLIENT APPLICATIONS	SOURCE CODE
WHILE DEVELOPING			
Hurley	API	VueJS front end	
PILOT/PRODUCTION			
Forma	Any direct SDK calls	Any backend system	Any frontend system

Demo

Demo https://blockchain-demo.instamed.com/

Block Browser https://blockchain-demo.instamed.com:8443 (use channel named “public”)

Code Walkthrough

Github repo https://github.com/instamed/healthcare-payments-blockchain

Developer Portal page https://developers.instamed.com/healthcare-payments-blockchain/

Lessons Learned

- HL7 FHIR v4 doesn’t support a Patient Payment Resource
- Building a tool to translate the FHIR resource definitions to Convector models is a tremendous timesaver
- HyperLedger Fabric has many components and is currently daunting to setup (installing the prototype has 16 steps - https://developers.instamed.com/healthcare-payments-blockchain/install-blockchain-on-linux/)
- HyperLedger Fabric doesn’t solve identity verification (Neither do public blockchains like Bitcoin as it is anonymous). Members are still required to handle authentication and identity verification (fraud prevention).

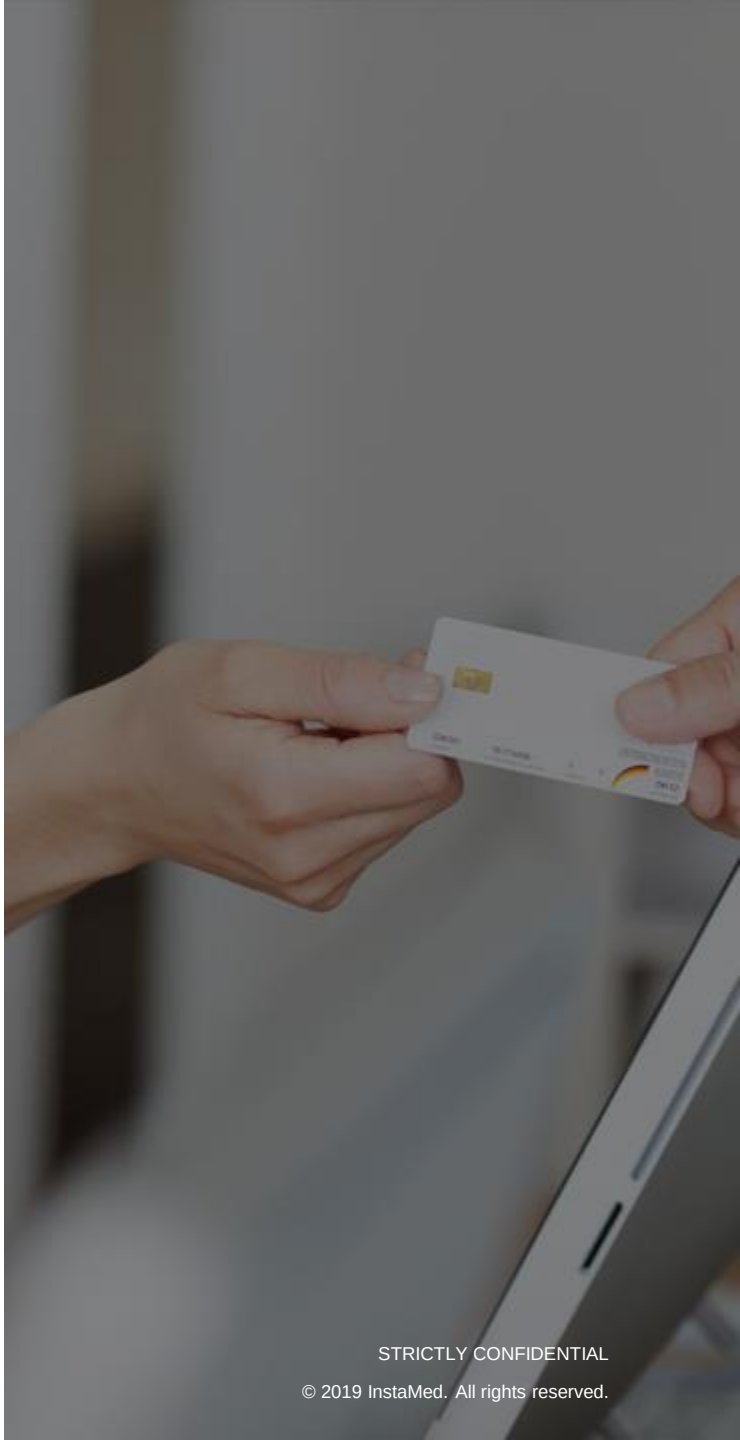
Possible Next Steps

- Work with HL7 FHIR community to add Patient Payment Resource in the next version
- Add additional resources (i.e. Explanation Of Benefit)
- Add additional financial workflows (coordination of benefits, claim denials and claim resubmission, patient invoice disputes)
- Write to the blockchain as part of processing transactions in the InstaMed platform (in a test environment)
- Read from the blockchain from separate applications representing separate entities
- Discuss the creation of a broad consortium that deals with data ownership and data exchange across the entire healthcare industry
- Work with industry collaborators to add clinical workflows (clinical models already added)

Questions

Email Us:

instamed.development@instamed.com



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