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BLOCKCHAIN IN HEALTHCARE TECHNOLOGY

Jonelle Saunders

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Blockchain in Healthcare Technology
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AGENDA

Blockchain 101:

– Basics of Distributed Ledger Technology

Potential industry uses

– EHR interoperability

– Identity Management

Limitations and challenges

?

A 2017 survey from IBM reports that 16% of healthcare entities may already be working with blockchain

SECTION 1

BLOCKCHAIN 101

Blockchain 101

What is blockchain? A decentralized shared ledger for recording the history of transactions that cannot be altered

Decentralized means it is distributed and no one is an owner

A chain of computers approves transactions before they are verified and recorded

Transactions are not valid until added to the chain

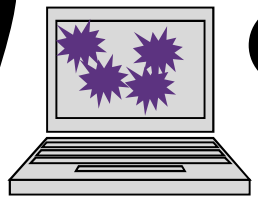
Everyone on the network can see transactions

Blockchain network is encrypted and secure

Popular Blockchain / Distributed Ledger Systems

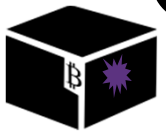
Blockchain 101

How does blockchain work?



1

A wants to send something of value to **B**



2

The transaction is represented as a block

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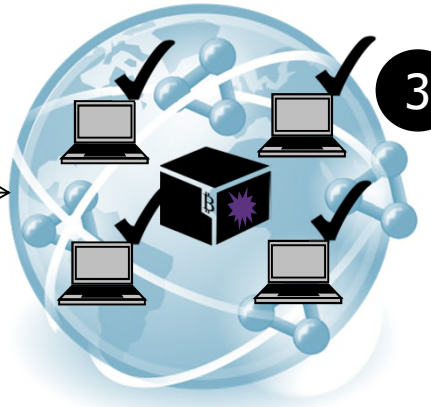
Transaction can be different types of data: including encrypted patient health information or provider identities



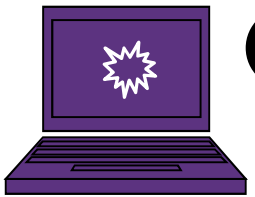
3

The transaction is broadcast to every party in the network

Those in the network approve the requestor's status and the validity of the transaction

4

The block is added to the ledger, the rest of the transactions on the network. This creates a "block chain," a transparent and unchangeable record



5

B receives the transfer of value from **A**

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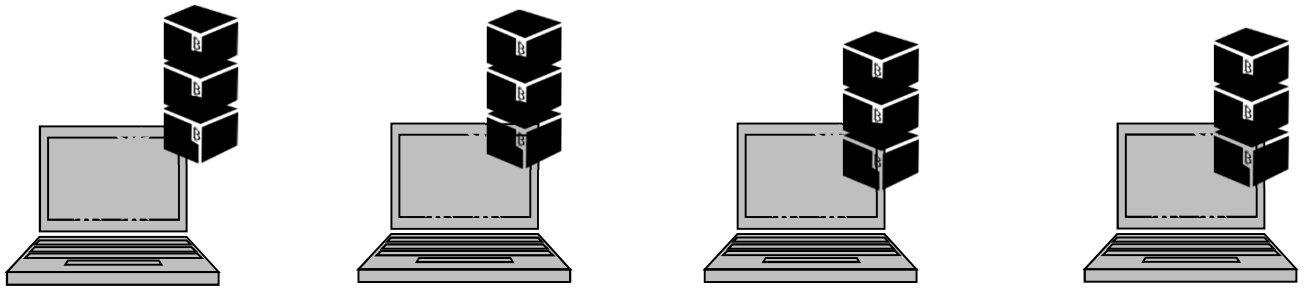
Blockchain 101

Synchronized, distributed ledger with multi-level access and encryption control

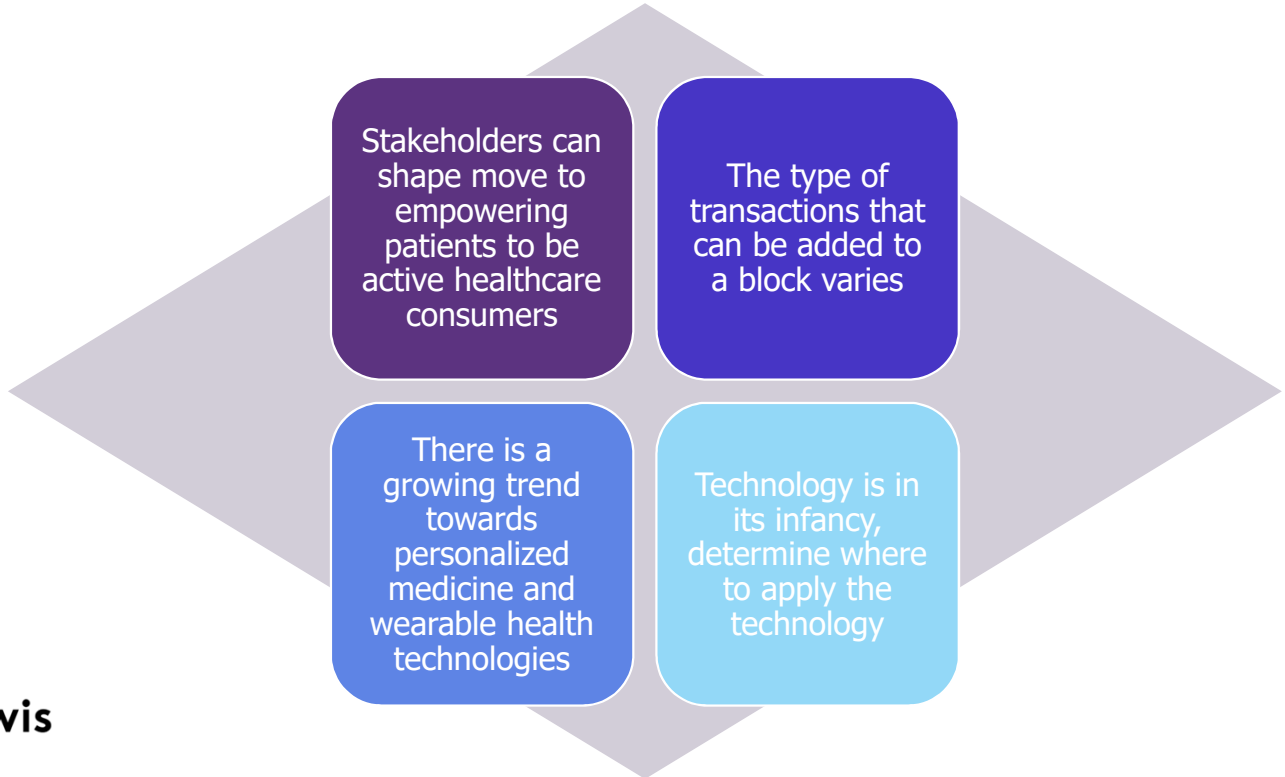
Present
Data Silos

Blockchain
Collective shared ledger

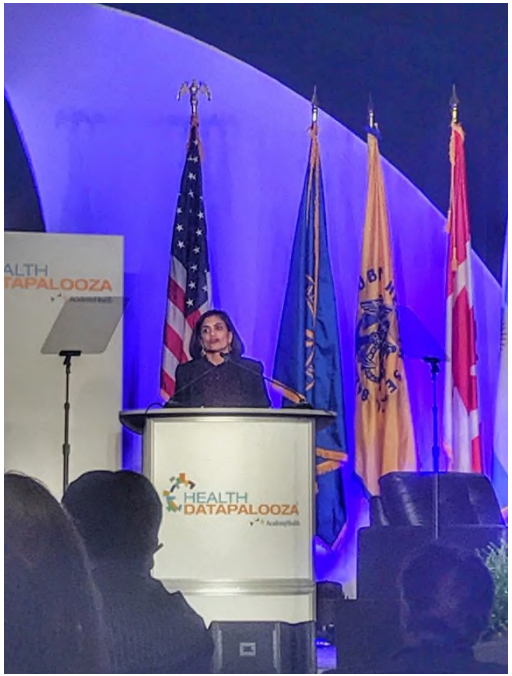


Blockchain 101

Why is blockchain relevant to healthcare?



CMS: MyHealthEData Initiative



- Centers for Medicare & Medicaid Services (CMS) focus on value-based care and increasing patient access to healthcare data with the MyHealthEData initiative
  - Patient Access and Data Control
  - Prohibition on Data Blocking
  - Interoperability and Data Portability
  - Reducing Provider Burden
  - Blue Button 2.0
- CMS request for information (RFI) to gain feedback from stakeholders about how to improve interoperability and encourage providers to electronically share health data with patients

CMS: Meaningful Use to Promoting Interoperability

CMS proposed rule transforms the meaningful use program into **"Promoting Interoperability"**

- Promoting Interoperability is used to qualify for incentive payments and to avoid reductions in Medicare payments
- The new requirements apply to eligible hospitals and critical access hospitals participating in the Medicare and Medicaid EHR incentive program
- Requires improved patient access to EHR data
  - By 2019, meet standards of making access to EHR data available for patients on the day of discharge
  - Implement technology and policy changes
- Post pricing for care services in a way consumers can understand

SECTION 2

POTENTIAL INDUSTRY USES

Healthcare Blockchain Use Cases

Transformative areas for adoption of block chain technology

- Supply Chains
- Clinical Trials
- Provider Directory Management
- Patient Records
- Credential Management
- Insurance preauthorization
- Claims adjudication

?

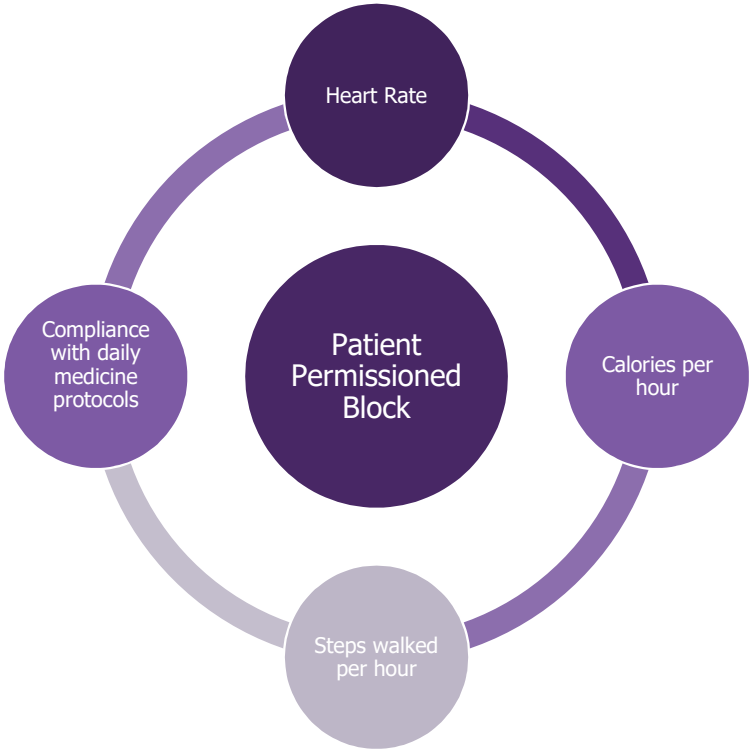
Use case is a list of actions or event steps typically defining the interactions

Potential Industry Uses: EHR Interoperability

Wearable Devices and Integrated Healthcare

Problem

- Patient events are disparate, disconnected and uncoordinated
- Lack of patient control and autonomy
- Difficulty sharing medical information with stakeholders while ensuring data integrity and protecting patient privacy
- Growing focus on care coordination, EHR access and value based metrics

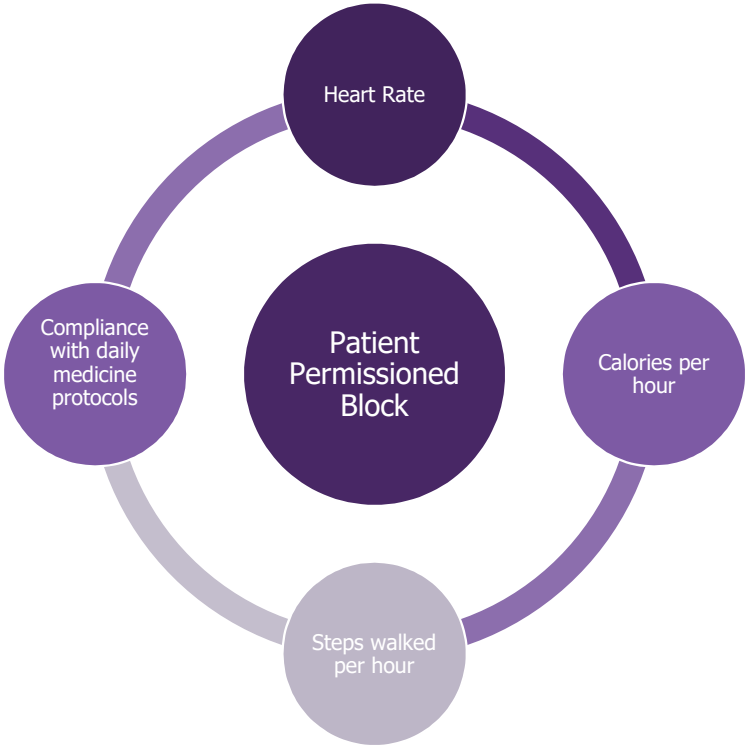


Potential Industry Uses: EHR Interoperability

Wearable Devices and Integrated Healthcare

Opportunity

- Patient data from multiple devices can be securely recorded and protected
- Integrate data from patient based technologies with information from EMRs with permissions
- Information with digital signature can be collected and matched with the same digital signature
  - De-identifying patient information with an assigned unique patient identifier
  - Access test results, prescriptions, physician referrals



Potential Industry Uses: EHR Interoperability

Wearable Devices and Integrated Healthcare

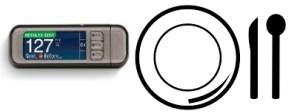
Medical Record Creation

Morgan visits Dr. Lewis for a routine visit and Dr. Lewis sends the medical report to the blockchain

The report is given a unique ID and the blockchain has a list of approved users and permissions

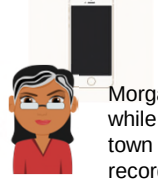
Morgan has share rights and control over how and when her data is shared

Wearable Device Data



Data from heart rate and glucose monitoring are sent from wearable devices and create a record history that lives on the blockchain

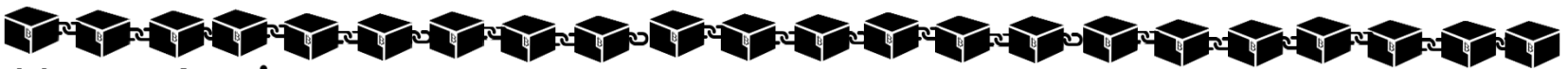
Medical Emergency



Morgan has an emergency while visiting family out of town and shares her medical records via the blockchain

Using blockchain records, the ER doctor is able to form a diagnosis with Morgan's full health profile

Information from the ER visit is logged in the blockchain, along with a historical audit log so that authorization and access of the data is recorded

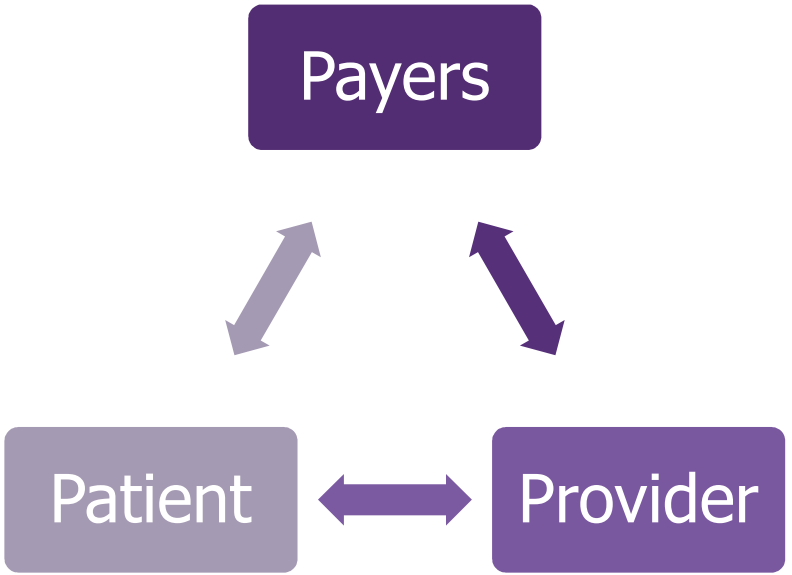


Potential Industry Uses: Healthcare Payments

Credentialing and Identity Management

Problem

- Healthcare providers must undergo a process of credentialing
  - To receive reimbursement for services as an in-network provider, the insurer verifies the provider's education, training, experience, and competency
  - Medical institutions review similar information before granting privileges
- Providers may have access to information that is not appropriate for them or may steal data

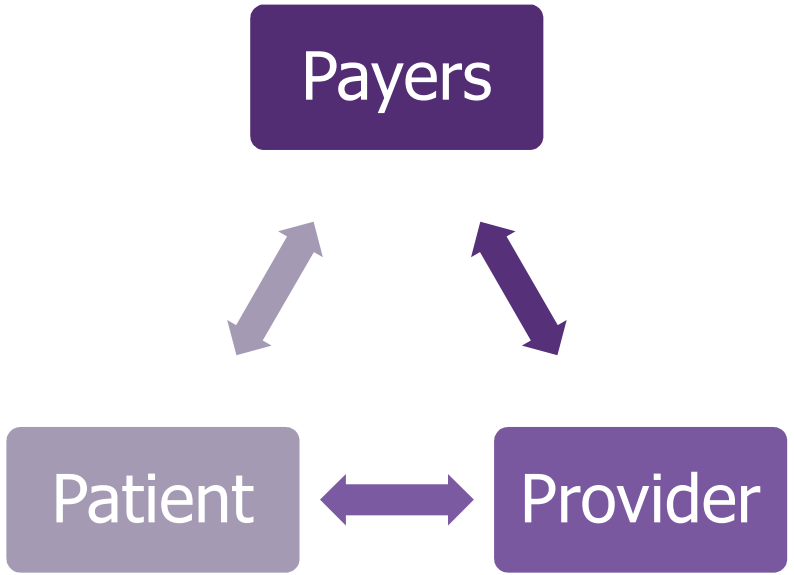


Potential Industry Uses: Healthcare Payments

Credentialing and Identity Management

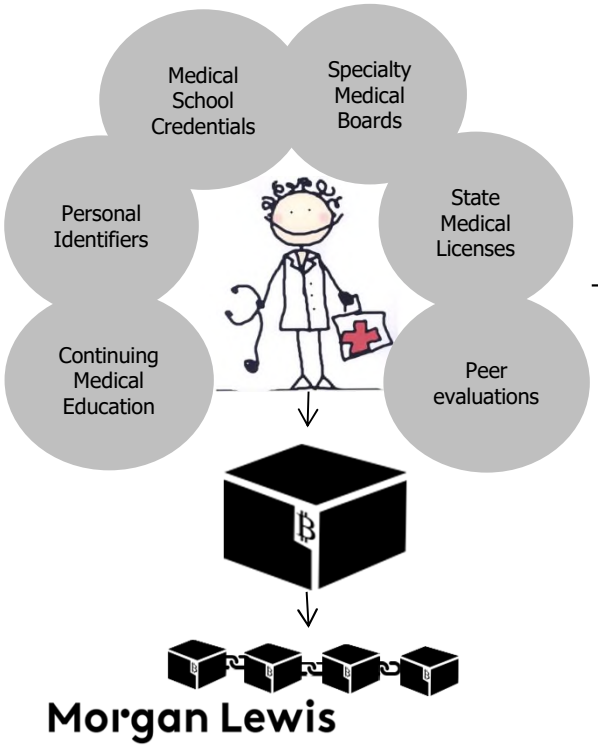
<u>Opportunity</u>

- Blockchain Empowered Healthcare Identity
  - Verify data in a record without actually seeing the contents of the record
  - Understand user identities and run analytics on activities
  - Less administrative double recordkeeping
  - Easier access to relevant data to join insurance provider networks

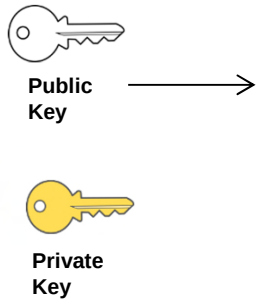


Potential Industry Uses: Healthcare Payments

Credentialing and Identity Management



Dr. Lewis joins a new medical institution and new payer networks



Dr. Lewis provides permissions to the blockchain network for certain credentialing data points which expedites the due diligence

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Potential Industry Uses

e-estonia

Estonia developed a nationwide blockchain EHR system

CDC Centers for Disease Control and Prevention

Researching use of blockchain for storing and exchanging medical data

NOKIA

Pilot in Finland sharing daily steps and sleep hours through Nokia's wearable HR monitor smartwatch

HASHED HEALTH

Pilots with Illinois for Provider and Patient identity management

bron.tech

Healthcare data-sharing platform that issues identity tokens to practitioners

Gem

Provider of blockchain solutions for enterprise and health data synchronization

pokitdok

Application programming interface (APIs) for healthcare verticals such as claims, pharmacy, and identity management

patientory

System that interconnects with any EHR system for management of data

CORAL HEALTH

Personalized medicine through business applications for healthcare participants

EncrypGen

Patient genomic information recorded for scientific use

SECTION 3

LIMITATIONS AND CHALLENGES

Limitations and Challenges

Every healthcare technology solution dealing with Protected Health Information (PHI) in the United States has to comply with the Health Insurance Portability Accountability Act (HIPAA)

HIPAA

Other countries have similar rules ie. GDPR in Europe, PIPA in Korea

Consider Breach Notification Requirements

Practical uses are ahead of the formal guidance and the regulation

Monitor guidance from Department of Health and Human Services Office for Civil Rights (OCR)

Limitations and Challenges

Blockchain technology may not fit into current legal and governance frameworks

Data Security

- IP rights
- Offensive remedies for first movers
- Responsibility for compromised files
- Supporting infrastructure of blockchain technologies will need to be secured

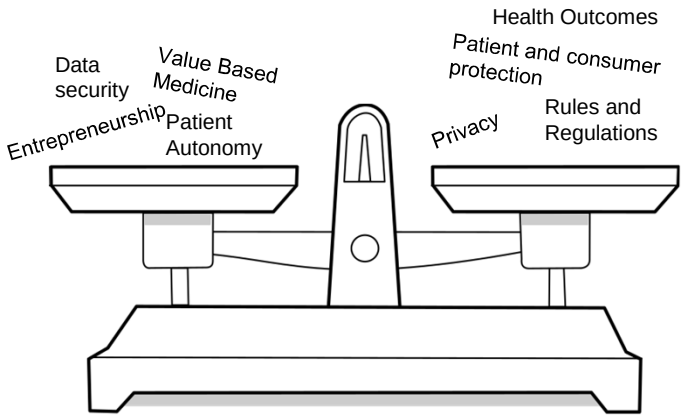
Privacy

- HIPAA compliance, reporting and notifications
- Privacy and security protections
- Governance models for removing data
- Decentralized nature lessens the ability that any single institution can be robbed or hacked to obtain large amounts of patient records

Limitations and Challenges

Costs and Scalability

- CMS has spent over $30 billion dollars since 2011 towards EHR adopton
  - New approaches will need to work alongside current technologies – bridge solution
- As users add data the blockchain grows
  - Storage costs and computational power demands
  - Too much data
- New technology inertia



Biography

Jonelle Saunders
Washington, D.C.
+1.202.739.5828
jonelle.saunders@morganlewis.com
Twitter: @JSaundersEsq
LinkedIn

Jonelle C. Saunders is part of our litigation and healthcare teams providing services in a wide range of areas. Jonelle advises clients on general litigation matters, corporate investigations, and regulatory enforcement and compliance. She also provides counsel to stakeholders across the healthcare industry on regulatory and litigation matters, including federal and state fraud and abuse matters.

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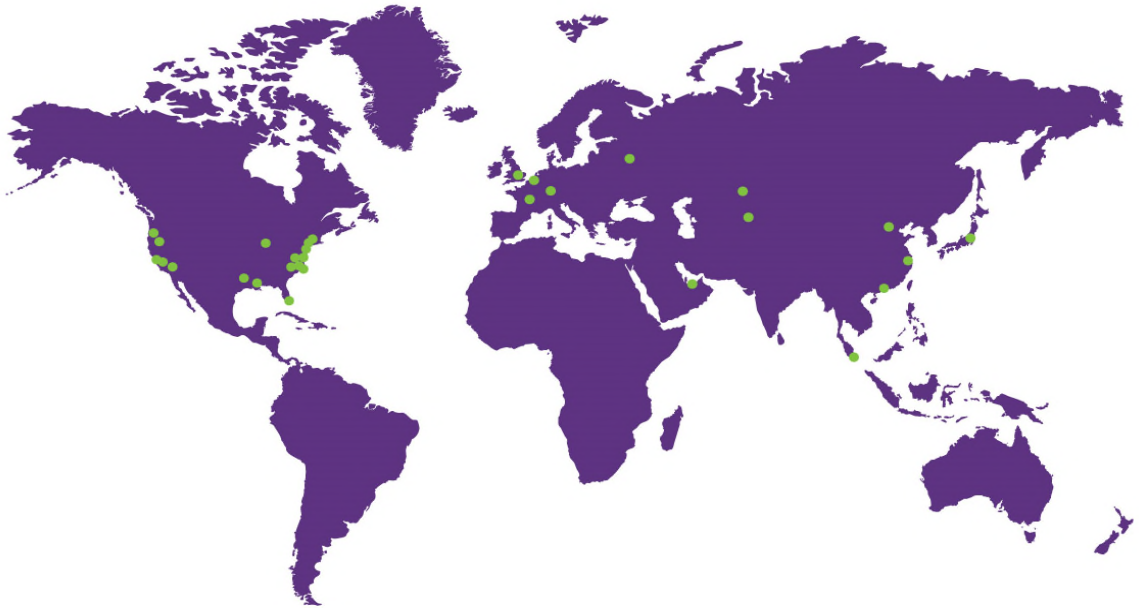

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