Exploring Private Blockchain Applications on Salesforce

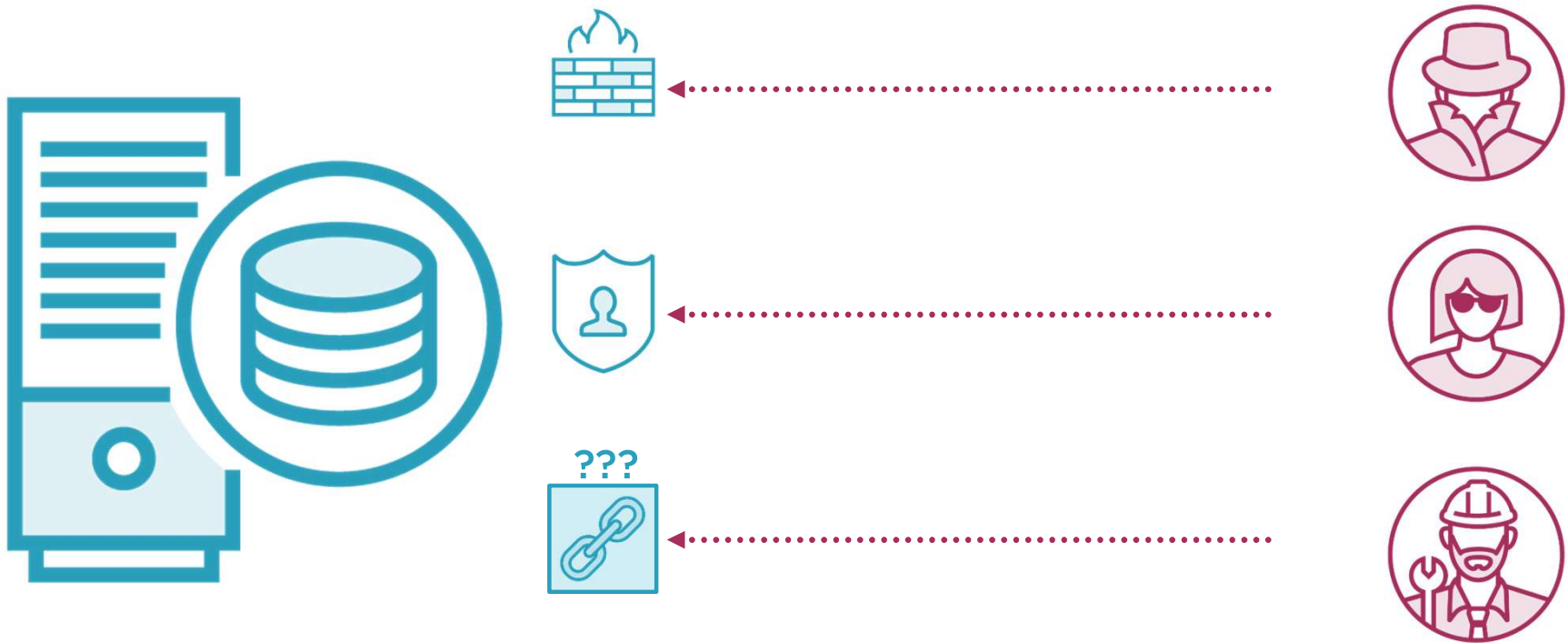**Dan Appleman**

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Private Blockchains and Salesforce

The Endless Struggle

The Endless Struggle

Seriously – disregarding the fact that investors will throw lots of money at us if we have a blockchain story...

Is there any legitimate role for blockchain in securing or maintaining our corporate data?

What Is a Private Blockchain?

As far as I'm concerned it has to be a distributed blockchain...

Data shared among cooperating organizations

That is, assuming such a thing should even exist!

But what about our own data… that we might share only selectively?

I like our corporate database. It actually works pretty well

As far as I can tell, there's nothing in the idea of linking blocks together that says it HAS to be distributed

Our Definition of Private Blockchain

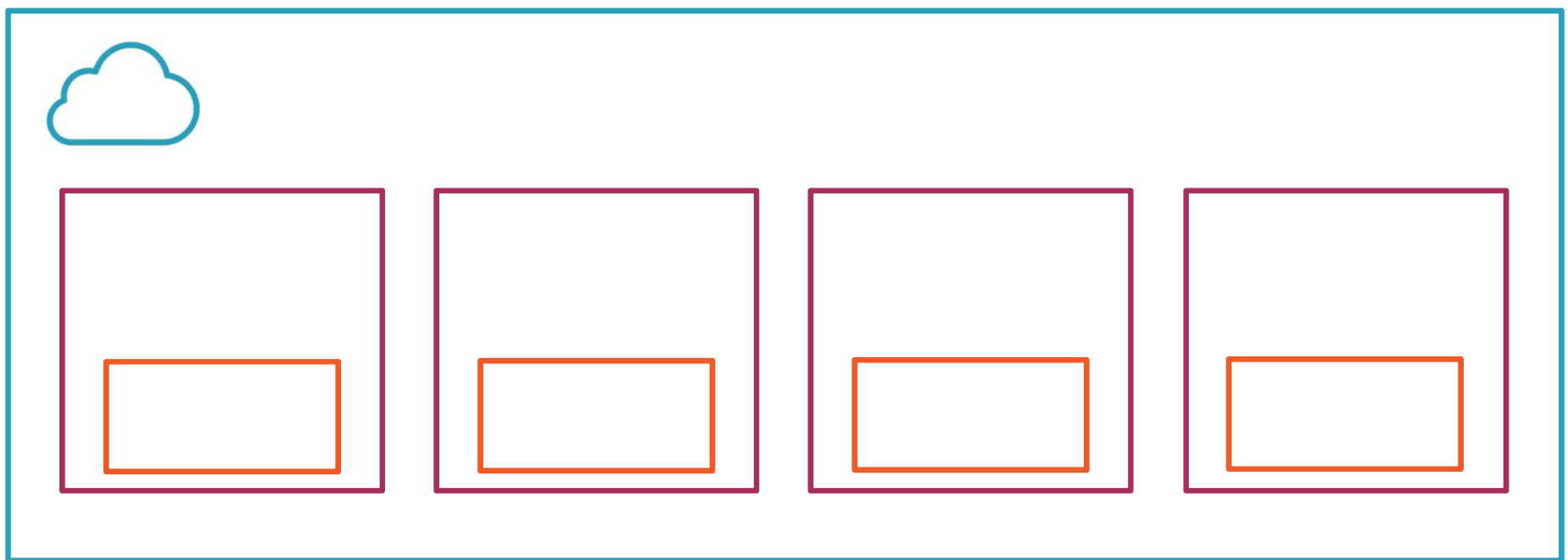A private ledger – only you can write to it

A public blockchain – anyone can view it

Data in the blockchain is private... wait, what? How is that possible?

Blockchain on a Database

☐ = custom object record

☐ = ledger transaction

I really don't see the point

Salesforce already has excellent security

And just because it's a blockchain doesn't mean I can't edit it

The Scenarios

Welcome to Globomantics!

GLOBOMANTICS

We are the best!

We are skilled and enthusiastic!

We embrace the latest technologies!

Don't you wish you could work here too?

The Brutal Truth About Globomantics!

GLOBOMANTICS

We are huge, chaotic and the politics are ugly

Some members of our team or incompetent (or worse, evil)

Our data quality isn't very good, and we get sued a lot

Remember When...

The (former) CFO "adjusted" some financial entries?

We went crazy trying to figure out why profits were down...

And then there were the lawsuits

It took a lot of work to find the tampering

And there were so many auditors and depositions...

I don't think anyone trusts us anymore

Or How About the Time...

The (former) VP of Sales "discovered" some new sales right before bonus time?

Funny how sales appeared just in time for the board meeting where they calculated bonuses...

And how did those sales people convince the database administrator to...

Have you ever actually looked at our security configuration? Talk about hard to understand...

How Much Do We Actually Owe?

The records those former account executives have don't match ours

And we're not even certain whose data is correct!

I guess the judge will have to figure that out...

I wonder who actually did leak that data...

It's Time for a Change!

I want deal data to be secured

I want to know about tampering right away

I want to be able to prove to outsiders that our data is reliable

I want our data to be kept private...

But, I want to be able to prove that individual transactions have not been modified over time - but without granting access to our systems

Security Is Not Just About Technology

Technology can fail if incorrectly configured or those responsible for it lack skills or can't be trusted

Audit trails can fail if they are ignored or hard to follow

Simpler security, that is more "idiot-proof" can provide an extra layer of protection

Ok – I can see how a blockchain can bring value to corporate data, but...

How do you make a database blockchain immutable?

And how can it be public and keep the data private at the same time?

Immutability and Confidentiality

Blockchain Review

Blockchains are not inherently immutable – it's always possible to recalculate hash values

One path to immutability is to make it hard to create or modify blocks

Another is to make it easy to detect modifications

Distributed vs. Read-only Distributed

Distributed Blockchain

Anyone participating in the blockchain can add blocks

Requires a way to make blocks hard to create and to resolve conflicts

Everyone has a full copy of the entire ledger and adds blocks to their copy

Read-only Distributed

Only your internal applications can add blocks

Use database security to control access to creating blocks. One source of truth at time of block creation

Everyone has access to a copy of the ledger from the database

But what about privacy?

Hash Functions

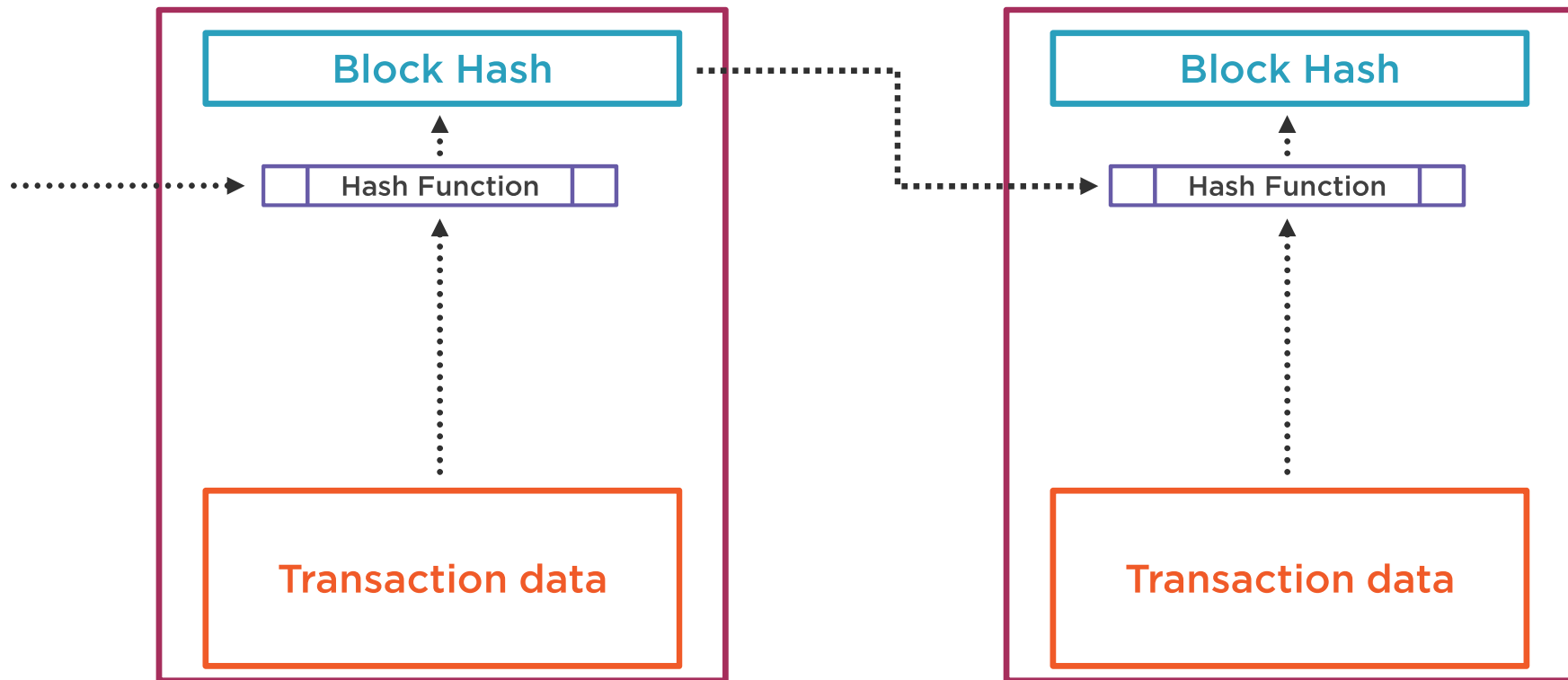Any input value always results in the same output value

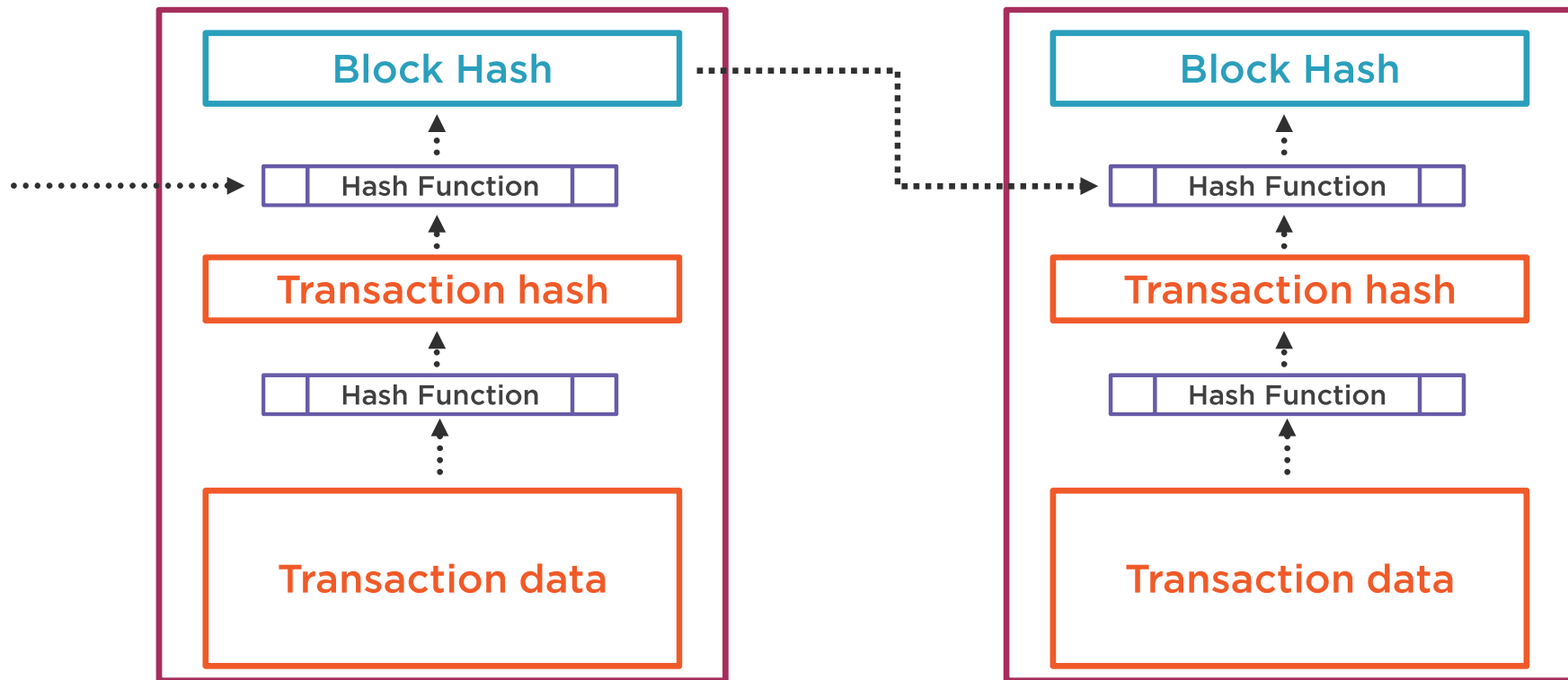A small change to the input value results in a large change to the output value

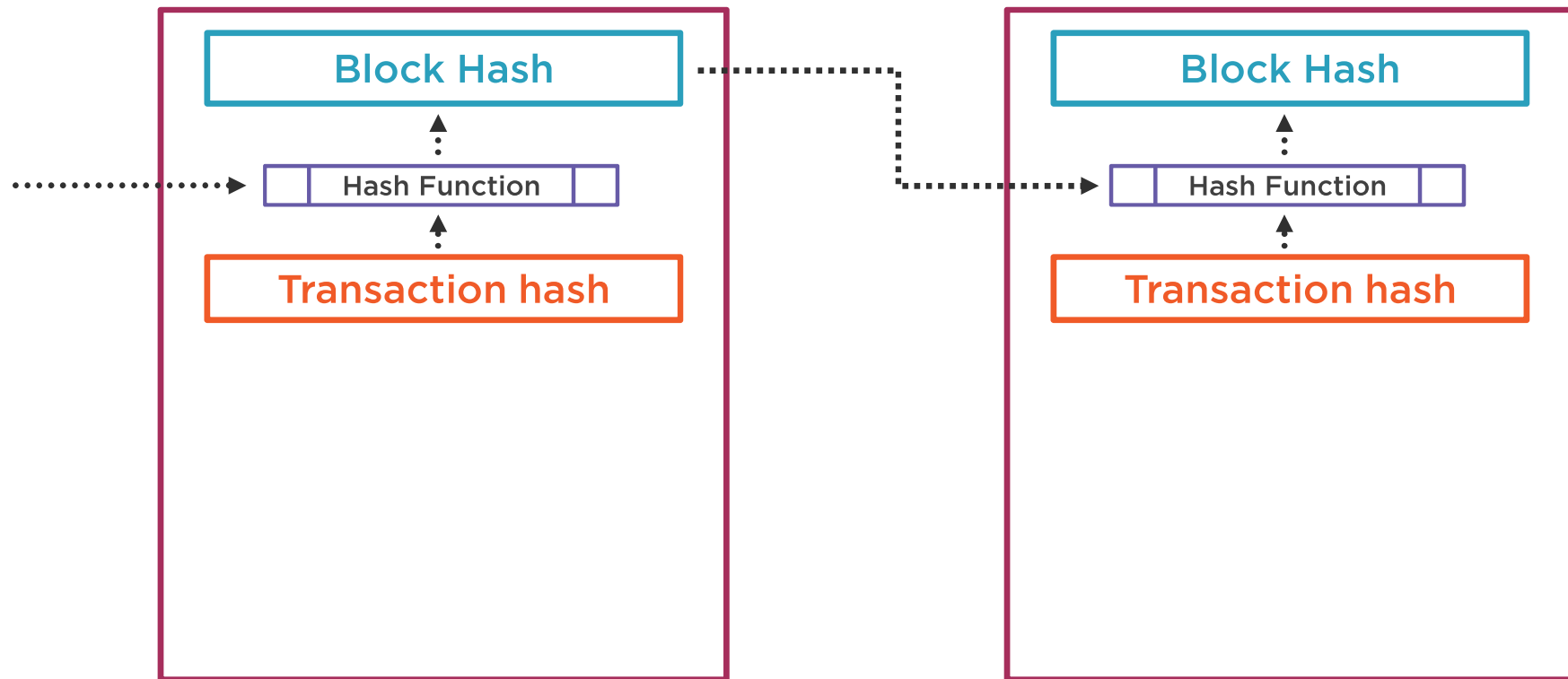It is impossible to determine the input value given the output value

Anatomy of a Block

Anatomy of a Block

A Blockchain Without Data

The Results

Remember When...

The (former) CFO tried to "adjust" some financial entries?

The blockchain failed to verify – we knew about it within hours

Or...

The next time we published a transaction, our auditors saw that it didn't validate against their copy of the ledger

The CFO was escorted out the door the same day

We Had No Problem Figuring It Out

How much do we actually owe those sales people?

The records those former account executives had didn't match ours

But we, and our auditors, and all the other salespeople had matching blockchains

So we just shared the data for the disputed transactions

The data matched the hash for the transaction – proof positive that our data was unchanged

Welcome to the New Globomantics!

GLOBOMANTICS

Blockchain Powered!

Ledger data can be audited without providing access to Salesforce!

Individual transactions can be proven valid without revealing other transactions

Welcome to the New Globlamantics!

GLOBOMANTICS

Blockchain Powered!

No more lost reservations in the travel division!

Accurate and auditable customer communications!

Improved reputation!

Now We're Talking!

I love the cost savings, and that it was inexpensive to implement

Our company culture has improved, and employees are less stressed

Auditing and legal costs have dropped, and we have better security

And productivity is up!

Coming Up Next

We're going to build a blockchain!

Admins and developers – please stick around!

Those who aren't interested in the implementation details, feel free to skip to the last module