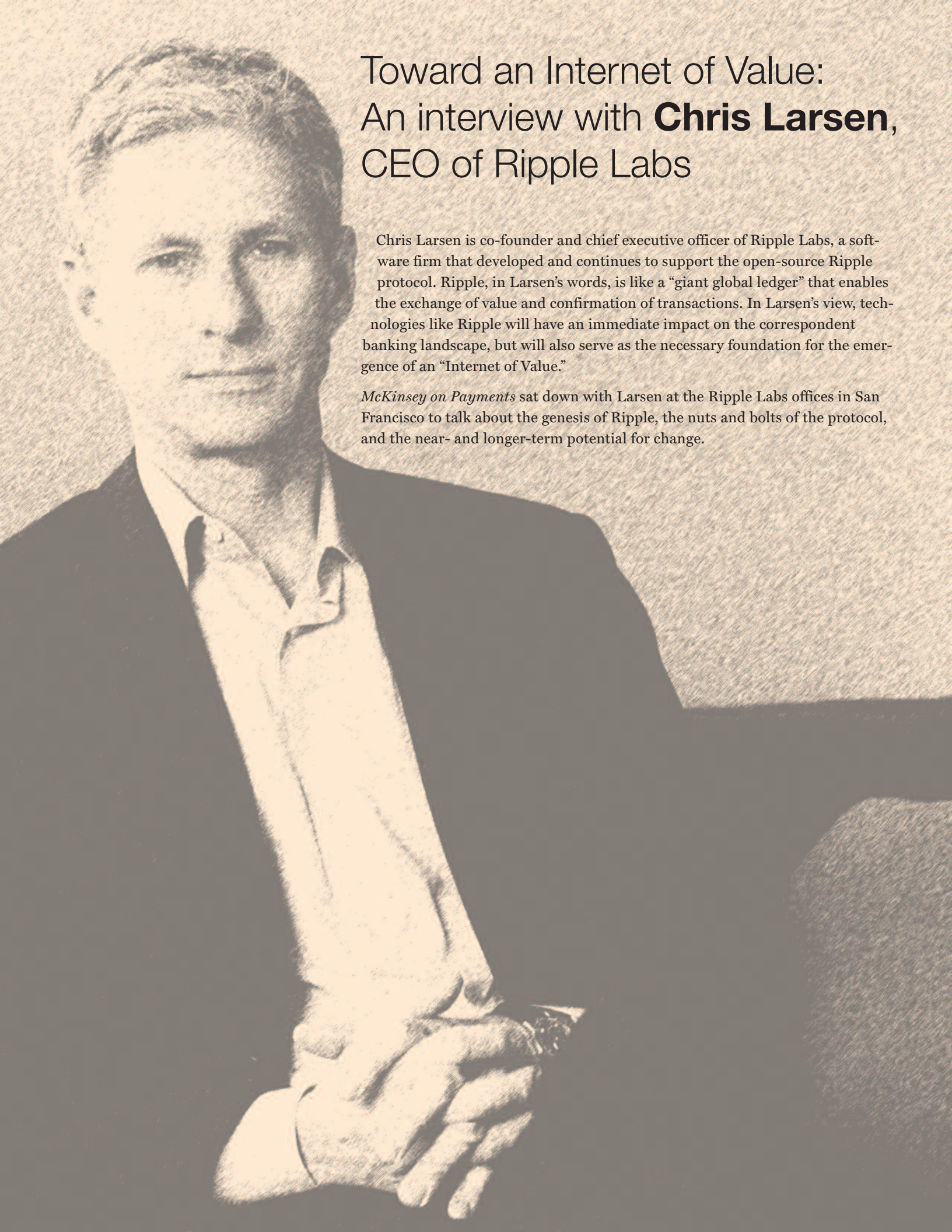




McKinsey on Payments

Foreword	1
Gauging the disruptive potential of digital wallets	3
While they have established a solid foundation for growth, digital wallets are by no means a guaranteed success. They must continue to evolve if they are to have a truly disruptive impact on the payments landscape. Providers can improve their chances by focusing on six “markers” for success in payments innovation.	
New partnership models in transaction banking	11
A number of trends are leading to a fundamental rethinking of the traditional model by which banks offer transaction banking services to clients outside their established markets. Four distinct partnership models offer the best opportunities for banks seeking to succeed in an evolving landscape.	
Toward an Internet of Value: An interview with Chris Larsen, CEO of Ripple Labs	19
<i>McKinsey on Payments</i> sits down with the co-founder of Ripple Labs to discuss the nuts and bolts of the Ripple protocol, the implications for the correspondent banking model, and the emergence of an “Internet of Value.”	
Faster payments: Building a business, not just an infrastructure	23
A faster payments infrastructure is not an end in itself, it is an opportunity for banks to deliver innovative products and services in both consumer and corporate payments. To monetize this opportunity, financial institutions should focus relentlessly on design, customer experience, accessibility and convenience.	



Toward an Internet of Value: An interview with **Chris Larsen**, CEO of Ripple Labs

Chris Larsen is co-founder and chief executive officer of Ripple Labs, a software firm that developed and continues to support the open-source Ripple protocol. Ripple, in Larsen's words, is like a "giant global ledger" that enables the exchange of value and confirmation of transactions. In Larsen's view, technologies like Ripple will have an immediate impact on the correspondent banking landscape, but will also serve as the necessary foundation for the emergence of an "Internet of Value."

McKinsey on Payments sat down with Larsen at the Ripple Labs offices in San Francisco to talk about the genesis of Ripple, the nuts and bolts of the protocol, and the near- and longer-term potential for change.

McKinsey on Payments: Chris, can we start with a description of Ripple and the problems it's seeking to solve?

Chris Larsen: The Ripple protocol is an open-source distributed ledger. It is currency-agnostic, and can confirm transactions in about five seconds. You can think of it as a giant global ledger that holds balances of different things of value and then allows for those things of value to be exchanged using a path-finding algorithm route, similar to how you might route packets of information on the Internet. Those are the two big things that the Ripple protocol does: confirm financial transactions without a central operator and then path-find the most efficient way to exchange value, or said another way, execute a currency trade.

That's the Ripple protocol. We are a software company called Ripple Labs that contributes code to the protocol and builds tools for financial institutions to use it. I'm the CEO of Ripple Labs. Importantly, Ripple Labs does not own the Ripple protocol. The protocol is a public good, essentially, and is open-sourced and distributed, and would exist even if Ripple Labs did not.

We see both near- and long-term use cases for the technology. In the near-term, we see Ripple as a viable alternative to correspondent banking. Payments today are slow and expensive because there is no global rail for moving value. There is a series of regional, closed-loop systems, and correspondent banking links these systems together. It works, but correspondent banking comes with high costs in the form of risks, fees, liquidity and time delays. To the point of risk, because it's a chain of links, transactions fail often, and there's no end-to-end transaction visibility. Liquidity costs tie up banks' working capital because they have to

prefund accounts at the correspondent banks, and foreign exchange isn't competitive.

A distributed system like Ripple enables real-time, bank-to-bank, cross-currency payments while minimizing all these costs. On Ripple, banks can move value without putting up capital with a correspondent bank, without paying fees, with end-to-end transaction visibility, and moving value in seconds instead of days. And very

importantly they benefit from a structural change in the way FX works. Instead of relying on a small handful of global money center banks for foreign currency exchange, Ripple provides a competitive marketplace for liquidity provision. Market makers from Wall Street to London and Hong Kong compete to earn spread. It's a whole new opportunity for market making, providing liquidity for global payments.

MoP: And the longer-term use case?

CL: We believe that the Ripple protocol represents the beginning of the "Internet of Value"—the "Value Web"—in which exchanging value will be as easy as exchanging information today on the

web. We're focused on the near-term use case because we think the first users should be the custodians of value—banks, financial institutions—just as the custodians of data (academic institutions, governments) were the first users of the Internet.

We expect to see a dramatic increase in the volume of payments. By reducing the cost of payments to practically zero and increasing the speed of payments to real-time, we expect the Internet of Value to give rise to a dramatic increase in the volume of payments, and innovation in payments. The Internet drove the same outcome for information sharing – think of the volume of information we share



daily via the web, and the entire new industries and innovations made possible by the Internet.

MoP: Historically, systems that move value, particularly correspondent banking, were designed to manage risks of various kinds—counterparty risk, anti-money laundering risks, et cetera—and much of the friction, some might say, arises from the need to manage those risks. If you contemplate an Internet of Value that is nearly frictionless, how do you think about the Ripple protocol in the context of risk management?

CL: Very importantly, we see Ripple as infrastructure technology that works with existing financial institutions, networks, messaging standards, rule sets, consumer applications, et cetera. Distributed payments technologies are fundamentally changing how payments work in terms of speed, reach, security and cost-efficiency. But the technology has to pair with banks' risk management and compliance systems. For example, Earthport is integrating Ripple with its proven, robust compliance framework that banks around the world already use.

MoP: Taking a step back, can you tell me how Ripple got started?

CL: The technology was started by early Bitcoiners who felt that Bitcoin's confirmation method, *mining*, was wasteful because it requires a lot of computing power and thus burns a lot of electricity. Ripple's confirmation method, consensus, confirms transactions or the current state of a distributed ledger without requiring a lot of computing power.

The primary objective of Ripple's design was to create a viable payment system. So this new method of confirmation also yielded the important capabilities of real-time settlement and the ability to transact across currencies. In Bitcoin, you can only move around bitcoins. On Ripple, users can transact across any currencies, like dollars to euros or yen.

MoP: How do the mechanics work? Is currency converted to the Ripple protocol for transportation, and then reconverted to another currency?

CL: Yes, that's correct. A bank creates a copy of its ledger on Ripple, and continues to keep collateral on its existing ledger. They se-

lect which other banks, networks, and market makers with whom they want to have relationships. For a given trade order, Ripple's algorithm crawls all of the available offers amongst the banks' relationships to find the lowest-cost, most efficient path. Ripple consensus then settles the transaction.

Importantly, a bank doesn't have to convert from fiat money to a digital currency and then move the digital asset and then convert it into another fiat currency. Banks continue to deal in the currencies they're used to and benefit from instant FX and settlement.

MoP: What are some of the challenges you see for Ripple, and for the idea of an Internet of Value?

CL: With no central operator, the protocol has to run in a distributed fashion very efficiently and scale to support the world's payments volume. With an Internet of Value, assume these technologies will actually power potentially a billion times more transactions than there are today.

The Internet of Value also requires bringing together the banking world with distributed systems technologists. They don't speak the same language.

MoP: Different tribes with different languages.

CL: Absolutely. The timelines are different; the vocabulary is different. We're trying to marry a culture that deeply understands correspondent banking, collection management, risk mitigation, AML and KYC, with distributed systems, cryptographic keys and system scalability. That's a big challenge, but we think we've got a good team to take it on.

On the regulatory side, the challenge is to educate regulators that these protocols, far from being threats, actually provide better tools for anti-money laundering compliance. With AML, you can reduce investigations that might take six months to trace all of the intermediaries, to immediately be able to trace all the counterparties and degrees of separation.

MoP: Central banks are obviously key stakeholders here.

CL: We're actively engaging with central bankers around the world. The technology offers a very real benefit for domestic real-time

settlement. Distributed payments has come along coincidentally right at a time when central banks are calling for faster or real-time settlement solutions.

MoP: On the technical front, one challenge mentioned frequently when distributed ledgers are discussed is the question of “no recourse.” If a transaction has been settled, there’s no recourse. How would you think about that in a world where large amounts of value are being transported on these rails?

CL: It’s important. People won’t give up the ability to complain to somebody and reverse a payment. This goes back to Ripple’s position in the payments stack: it sits at the bottom, purely acting as technology infrastructure. Payment rules and networks, which are expert at providing services to enact those rules (like a Visa or American Express), are necessary parts of the payments stack that work with Ripple.

MoP: So the Ripple protocol would enable the value exchange, but the control for something like recourse would sit higher in the stack?

CL: Exactly.

MoP: Tell us about the journey of building Ripple Labs and how you grow the company, sustain a technology culture.

CL: We’re very dedicated to being a technology company first and foremost. About two-thirds of our team is engineers. While sometimes consumer companies get all the glamour, our mission—moving value

in the way that information already moves on the web—could have a huge impact. And that’s what I think great tech talent is looking for: how do I make an impact on the world?

Our core values are the foundation for our culture. They are: *open*, *constructive*, *inclusive*, and *humble*. Open, because we believe the Internet of Value will be open and we promote open standards. Constructive is about building, not disrupting. Disruption is something you do to your enemies.

We aim to be inclusive, working with regulators, banks, and market makers from China, to Europe, to the U.S. After all, the Internet of Value will touch every corner of the world when it takes hold.

Finally, we keep it in perspective. We’re just building infrastructure. The infrastructure will provide a new foundation and give way to entirely new types of innovation further up the payment stack, like with consumer applications. We’re happy for Ripple to be to-tally invisible to consumers.

MoP: Ten years from now, where would you like the Ripple protocol and Ripple Labs to be?

CL: We would like to be recognized as a leader in distributed payments technology, and for having helped develop standards for the Internet of Value. In ten years, I hope we can feel proud that we contributed to a major turning point in finance. We think we’ve reached a bright line. There’s no turning back or putting the genie back in the bottle. The Internet of Value is coming.

