<table>
<thead>
<tr>
<th>Topic</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction and agenda review</td>
<td>Guy Berg, VP of the Payments, Standards, and Outreach Group of the Federal Reserve Bank of Minneapolis opened the meeting.</td>
</tr>
<tr>
<td>2. Ripple presentation on blockchain and payments: hype vs. reality</td>
<td>Ryan Gaylor, Director of Corporate Payments, Ripple gave a presentation on blockchain and payments, focusing on real production use cases. Thanks to Ryan for an informative presentation. <em>The deck is included with distribution of this meeting summary.</em></td>
</tr>
<tr>
<td>3. Vendor Forum initiative updates</td>
<td>Guy Berg and Patti Ritter gave updates on current Vendor Forum initiatives. <em>Refer to the deck included with distribution of this meeting summary.</em></td>
</tr>
<tr>
<td>4. Vendor Forum updates</td>
<td>Ernie Martin, chair of the Vendor Forum, gave updates on the Vendor Forum. The Vendor Forum member directory is updated quarterly. If you have updates or want your company included, please contact the Vendor Forum at <a href="mailto:business.payments.smb@mpls.frb.org">business.payments.smb@mpls.frb.org</a> by the end of June. Ernie will be compiling a 2018 Industry Trends document. The Trends document is designed and positioned to be a “calling card” and will illustrate the value members bring to the Vendor Forum as well as the value of the Forum to the payments and related industry, overall. An email was sent May 29 requesting member contributions. Return the questionnaire to <a href="mailto:business.payments.smb@mpls.frb.org">business.payments.smb@mpls.frb.org</a> by the end of June.</td>
</tr>
<tr>
<td>5. Other discussion and wrap up</td>
<td>Next Vendor Forum meeting: In-person meeting at the CRF Forum and Expo in Orlando, Fl, Tuesday, August 14, 10 am – 12 pm JW Marriott Orlando Grande Lakes <a href="https://www.crfonline.org/events/august/">https://www.crfonline.org/events/august/</a></td>
</tr>
</tbody>
</table>
Blockchain Hype vs. Reality

Transforming Global Payments
Agenda

1. What is Blockchain
2. Application to Payments
3. Sample Use Cases
4. Digital Assets and IoV
5. Q&A
What Is a Blockchain?
All Blockchain Use Cases Stem From Payments

- Trade Finance
- Securities
- Lending
- Smart Contracts
- Insurance
Today’s Inefficient Payments Networks

**DISPARATE**
Different tech, systems of record, messaging and rules

**SLOW**
3-5 days to settle across numerous intermediaries

**OPAQUE**
Poor data flow inhibits information transparency

**EXPENSIVE**
High processing costs limit addressable market and servicing
Domestic Payments are Settled Through a CCP

ACH, FPS, CHAPS, etc.

There is no Universally Accepted CCP for Intl Payments

This makes international payments difficult
Sample Cross-Border Payment Today

Limited Visibility and Uncertainty Result in Poor Client Experience

Originator → Originator’s bank → Correspondent bank → Beneficiary’s bank → Beneficiary

- **Payment instructions**
  - No fee pre-disclosure or status tracking

- **Correspondent bank**
  - Low visibility, No rich data attached

- **Beneficiary’s bank**
  - Uncertainty around final-mile delivery, limited reach

- **Multiple-day settlement**
  - No confirmation or traceability

**Sample Cross-Border Payment Today**
**Impacts to Cross-Border Payments**

Limitations have a direct impact on the ability to effectively manage liquidity

<table>
<thead>
<tr>
<th>Technical Gaps</th>
<th>Operational Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Linear Messaging (vs. Atomic Settlement)</td>
<td>● Requires pre-funding of operations</td>
</tr>
<tr>
<td>● Visibility into:</td>
<td>● Results in idle cash</td>
</tr>
<tr>
<td>○ Payment Status</td>
<td>● Increased FX risk</td>
</tr>
<tr>
<td>○ Fees</td>
<td>● Payment Fraud</td>
</tr>
<tr>
<td>○ FX Rate</td>
<td>● Reconciliation Challenges</td>
</tr>
<tr>
<td>● High Failure Rates</td>
<td>● Full payment amount not received</td>
</tr>
<tr>
<td>● Limited Remittance Information</td>
<td></td>
</tr>
</tbody>
</table>

**Linear Messaging (vs. Atomic Settlement)**

- Requires pre-funding of operations
- Results in idle cash
- Increased FX risk
- Payment Fraud
- Reconciliation Challenges
- Full payment amount not received

**Technical Gaps**

- Visibility into:
  - Payment Status
  - Fees
  - FX Rate
- High Failure Rates
- Limited Remittance Information
Blockchain Can Be Used to Create Trust In Settlement

<table>
<thead>
<tr>
<th>Originating Bank Ledger</th>
<th>Beneficiary Bank Ledger</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Originator</strong></td>
<td><strong>Beneficiary</strong></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Hold</strong></td>
<td><strong>Hold</strong></td>
</tr>
<tr>
<td>100 USD</td>
<td>85 EUR</td>
</tr>
<tr>
<td><strong>Liquidity provider</strong></td>
<td><strong>Beneficiary</strong></td>
</tr>
<tr>
<td>100 USD</td>
<td>85 EUR</td>
</tr>
</tbody>
</table>

**FX Rate = 1.176**
Sample Cross Border Payment Using Blockchain

- Payment instructions
- Invoice
- Pre-disclosures of fees and rates
- Real-time payments with certainty
- Exact invoiced amount settled
- Corporate
- Corp’s bank
- Supplier’s bank
- Supplier
- Supplier gets paid exactly the amount invoiced in real-time; shipments can be released as planned
### Impacts to Cross-Border Payments

Ability to leverage blockchain for payments provides strategic advantages

<table>
<thead>
<tr>
<th>Technical Enablement</th>
<th>Strategic Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Real Time Settlement</td>
<td>• Global Liquidity Management</td>
</tr>
<tr>
<td>• Atomic Settlement</td>
<td>◦ Consolidation of Balances for Investment, Tax</td>
</tr>
<tr>
<td>• Fee and FX Rate Disclosure</td>
<td>◦ On-demand Funding of Operations</td>
</tr>
<tr>
<td>• Transparency into Status</td>
<td>◦ Greater IHB / Cash Pooling Efficiency</td>
</tr>
<tr>
<td>• Rich Payment Data</td>
<td>• Centralized Payment Factories</td>
</tr>
<tr>
<td></td>
<td>• Efficient Risk Management</td>
</tr>
<tr>
<td></td>
<td>• Efficient Supply Chain Management</td>
</tr>
</tbody>
</table>
Use Case 1: Spot Funding Operations

Traditional “Bulk” Funding Process

Bulk funding operations on a monthly or quarterly basis results in idle cash.
Use Case 1: Spot Funding Operations

Real-Time, Cross-Border Payments Enables a Shift to Spot Funding

Spot funding reduces idle cash, FX risk and counterparty exposure
SEB, a Scandinavian bank, has pursued a corporate payments use case with Ripple on behalf of one of its corporate customers from Sweden to the US. As of Q1 2018, SEB has processed over $900M in volume over Ripple. With Ripple, SEB has been able to reduce the time to settle from hours to seconds.

“Ripple’s solution allows our customers to send real-time transfers between their SEB accounts in Sweden and New York. We plan to expand the solution to all geographies and time zones in which we operate.”

Paula da Silva, Head of Transaction Services at SEB
Many corporates will require international vendors to bid only in their functional currency, pushing FX costs to suppliers.
Partnering w/Procurement

Recommended Process - Supporting Local Currency Pricing

Supplier Quotes

Bids compared on parity basis

15% discount to $ price

Supporting bidding in multiple currencies can result in lower supplier costs.
Corporate payments use case to send Europe-originated real-time payments to Santander. The bank is targeting new client acquisition by offering B2B and trade payments for European import/export businesses.
Santander faced pressure from non-bank competitors taking their share of international payment volumes. One Pay FX is a consumer payments application that allows money to be sent from U.K. to U.S. and in the E.U.
Our Vision

The Internet of Value:
Enable the world to move money like information moves today.
Global Payment Demand on the Rise as Global Banking Reach Decreases

Correspondent Banking Relationships in thousands

- 26 (2002)
- 22 (2005)
- 19 (2007)
- 18 (2010)
- 14 (2012)
- 13 (2013)
- 12 (2014)
- 12 (2015)

Global E-Commerce Sales in billions

- 225 (2015)
OUR VISION

Digital assets eliminate the need for nostro accounts
The Benefits of Digital Assets

Eliminate the need to hold nostro balances and low liquidity currency pairs
How xRapid Works: USD -> MXN Example

0. Quote estimate for USD->MXN payment
1. Instructions for USD->MXN payment
2. Exchange USD for XRP
3. Withdraw XRP to receiving exchange
4. XRP settled across XRP Ledger
5. Exchange XRP for MXN
6. Initiate local rail payout in MXN
Q&A
e-Invoice Interoperability Framework Update
Business Payments Coalition
3 Year Plan

Assess
- Conduct preliminary assessment of existing global frameworks for suitability and feasibility in the U.S.
- Conduct gap analysis technical requirements

2018

Engage
- Engage key industry stakeholders on the assessment results

2018

Develop
- Establish workgroups of industry stakeholders to:
  - Develop the technical and semantics requirements for the framework
  - Create governance and operational guidelines for stakeholders

2018-2019

Market Acceptance
- Encourage stakeholders to adopt the framework requirements

2020+
## Current International e-Invoicing Frameworks

<table>
<thead>
<tr>
<th>Country/Region</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>European Union</strong></td>
<td>EU Directives (2014/55/EU) instructs member states to adopt e-Invoicing solutions (i.e., PEPPOL) for B2G invoices by April 2019</td>
</tr>
<tr>
<td></td>
<td>Pan European Procurement Portal Online (PEPPOL)</td>
</tr>
<tr>
<td></td>
<td><strong>Interoperability Framework</strong></td>
</tr>
<tr>
<td><strong>Message Delivery:</strong></td>
<td>OASIS ebMS3 AS2,</td>
</tr>
<tr>
<td><strong>Business Discovery:</strong></td>
<td>OASIS SML and SMP, DUNS, and GS1-GLN</td>
</tr>
<tr>
<td><strong>Data Format:</strong></td>
<td>OASIS UBL 2.1, UN/CEFACT, and UN/EDIFACT</td>
</tr>
<tr>
<td><strong>Australia</strong></td>
<td>Digital Business Council – e-Invoice Interoperability Framework</td>
</tr>
<tr>
<td></td>
<td><strong>Interoperability Framework</strong></td>
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<tr>
<td><strong>Message Delivery:</strong></td>
<td>OASIS ebMS3 AS4,</td>
</tr>
<tr>
<td><strong>Business Discovery:</strong></td>
<td>OASIS SML and SMP, DUNS, and GS1-GLN</td>
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<tr>
<td><strong>Data Format:</strong></td>
<td>OASIS UBL 2.1</td>
</tr>
<tr>
<td><strong>New Zealand</strong></td>
<td>Digital Business Council – e-Invoice Interoperability Framework</td>
</tr>
<tr>
<td>(under consideration)</td>
<td><strong>Interoperability Framework</strong></td>
</tr>
<tr>
<td><strong>Message Delivery:</strong></td>
<td>OASIS ebMS3 AS4</td>
</tr>
<tr>
<td><strong>Business Discovery:</strong></td>
<td>OASIS SML and SMP, DUNS, GS1-GLN, and ABN</td>
</tr>
<tr>
<td><strong>Data Format:</strong></td>
<td>OASIS UBL 2.x</td>
</tr>
<tr>
<td><strong>United States</strong></td>
<td>Interoperability Framework?</td>
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<tr>
<td></td>
<td>Message Delivery:</td>
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<td></td>
<td>Business Discovery:</td>
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<td>Data Format:</td>
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# e-Invoice Interoperability Framework Activity Plan

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<tr>
<td>Direction &amp; Objectives</td>
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<td></td>
<td>Develop implementation plan</td>
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<td>Preliminary Situation Analysis</td>
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<tr>
<td>Evaluate Market Models</td>
<td>Access Point Implementation Analysis</td>
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<tr>
<td>Preliminary Framework Assessment</td>
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<tr>
<td>Detail Technical Gap Analysis</td>
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<tr>
<td>Detail Semantic Gap Analysis</td>
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<tr>
<td>Next Steps</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Review Assessments with Stakeholders</td>
</tr>
<tr>
<td>Solution Development</td>
<td>Technical</td>
<td>Publish Technical Requirements</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Semantic Model</td>
<td>Publish Semantic Model</td>
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<tr>
<td></td>
<td>Governance Plan</td>
<td>Implement Governance Structures</td>
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<tr>
<td></td>
<td>Accreditation Plan</td>
<td>Implement Accreditation Program</td>
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<tr>
<td>Outreach</td>
<td>Outreach to Stakeholder Communities</td>
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Key Themes that Emerged

- An interoperability framework seems technically feasible for the U.S.
- An e-Invoice semantics model is important and valuable to the market
- Security, trust and confidentiality (data privacy) are important
- An impartial third party should lead any industry effort
- A governance organization is needed to maintain standards and credential participants; this should be an independent group
- It will be important to enumerate the costs and benefits for service providers
- Adoption is key: with no mandate, it will be important to get several established service providers on board initially, and government participation could help create critical mass
Industry Engagement Meetings

- BPC Assessment Team
- IOFM Fall Conference (2017) - The Institute of Finance and Management (IOFM) is the leading organization and community for financial operations professionals.
- CRF East Coast Regional Forum
- MN AFP
- BPC at the NACHA Conference
- Exchange Summit - Thought leaders and professionals in E-Invoicing, Purchase to Pay, E-Procurement, Supply Chain Finance, AR/AP.
- Data Coalition - The Data Coalition advocates on behalf of the private sector and the public interest for the publication of government information as standardized, machine-readable data.
- BPC Vendor Forum
- Joint FRS/ABA Meeting 2018
- Joint FRS/ICBA Meeting 2018
Next Steps

• So where do we go from here?
  — This was the starting point for defining a invoice for the U.S.

• New work groups will be forming to address:
  — Identifying the data elements and rules for a core invoice for the U.S.
    o Work group convening in early June
  — Conducting a technical gap assessment
  — Understanding the implementation requirements for a access point

• Next In Person Meetings:
  — Business Payments Coalition Vendor Forum - CRF Forum – August 14 in Orlando, FL
  — E-Invoice Work Group – September 12 – 14, Minneapolis, MN
  — Business Payments Coalition – AFP, November 4 in Chicago, IL
Vendor Forum Initiative Update

• Simple Remittance work group
  — Initiative is complete and the Simple Remittance Requirements are available on the BPC web site

• SMB Accounting APIs initiative
  — Objective: gather, compile and publish a list of Application Programming Interfaces (APIs) that can be used with SMB accounting software to automate electronic payments
  — Group is currently doing first-pass research to confirm software that has APIs
  — Next step: research and document APIs for software in scope

• The ISO 20022 Capabilities work group
  — Objective: develop an online registry of US banks and service providers that have ISO 20022 capabilities
    o The registry will be a resource to end users and will publicize the availability of ISO 20022 for payment and cash management operations.
  — Group is finalizing the submission form
  — Next step: test the form with a handful of organizations