



BLOCKCHAINS

ARCHITECTURE, DESIGN AND USE CASES

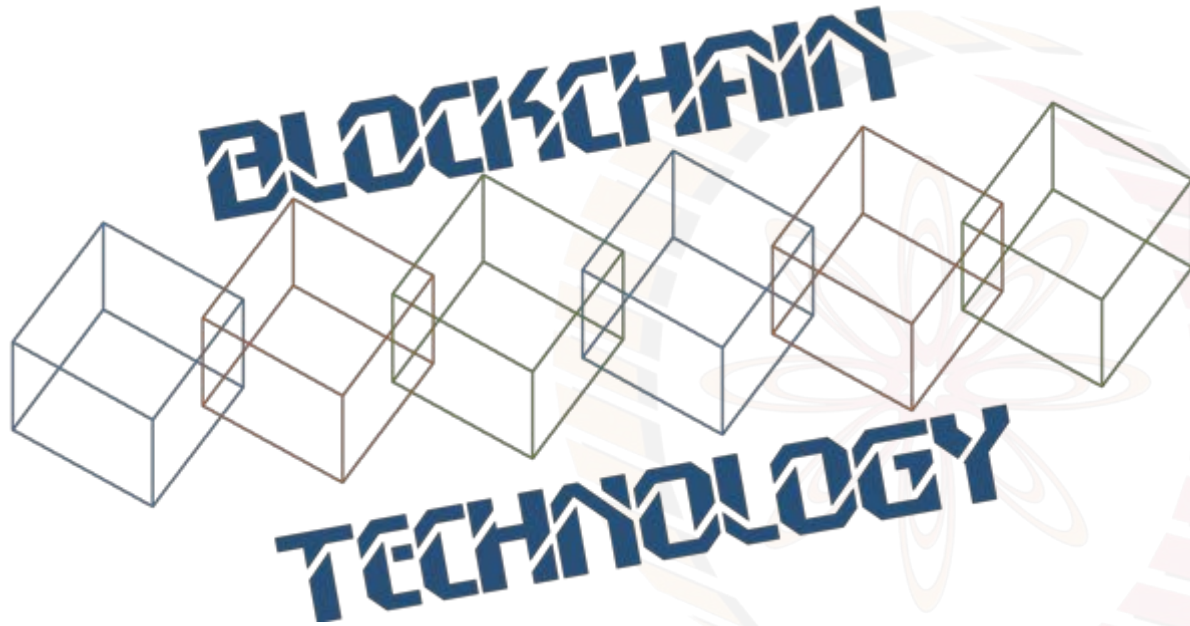
SANDIP CHAKRABORTY

COMPUTER SCIENCE AND ENGINEERING,
IIT KHARAGPUR

PRAVEEN JAYACHANDRAN

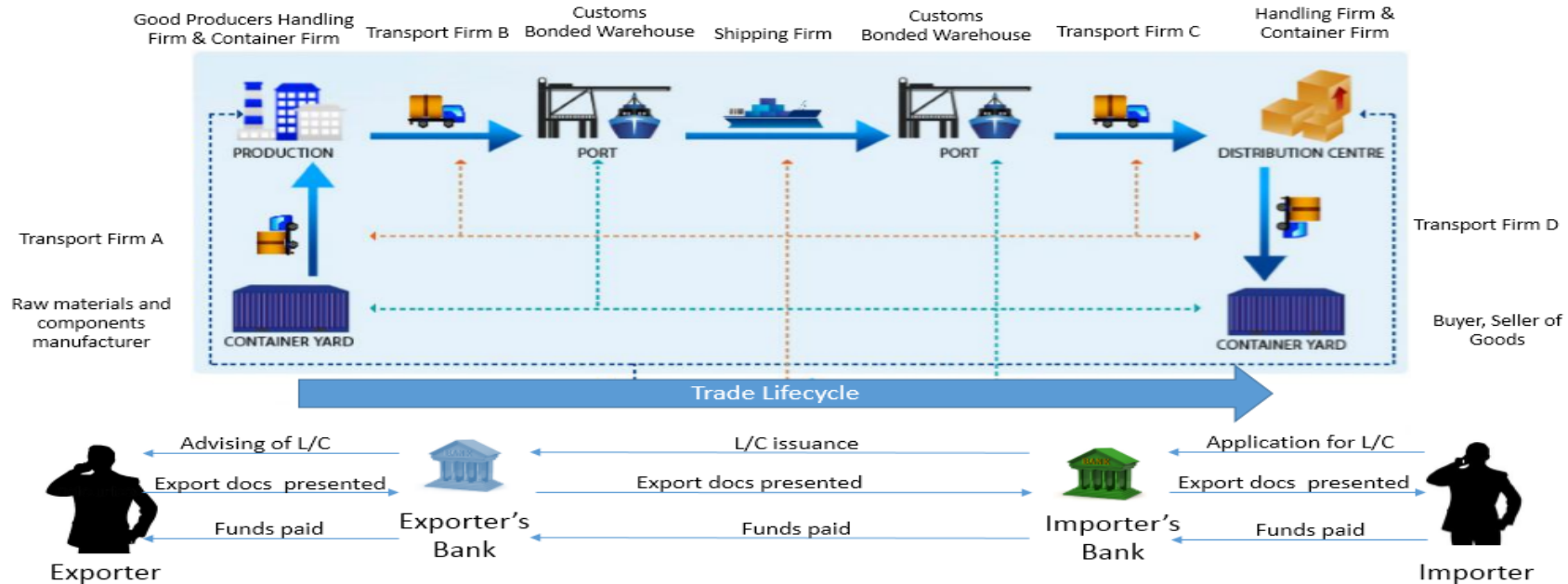
IBM RESEARCH,
INDIA

Image courtesy: <http://beetfusion.com/>



BLOCKCHAIN IN FINANCIAL SERVICES: FINANCING TRADE

Overview of International Trade



Inefficiencies

- 12 parties
- 27 documents
- Low automation

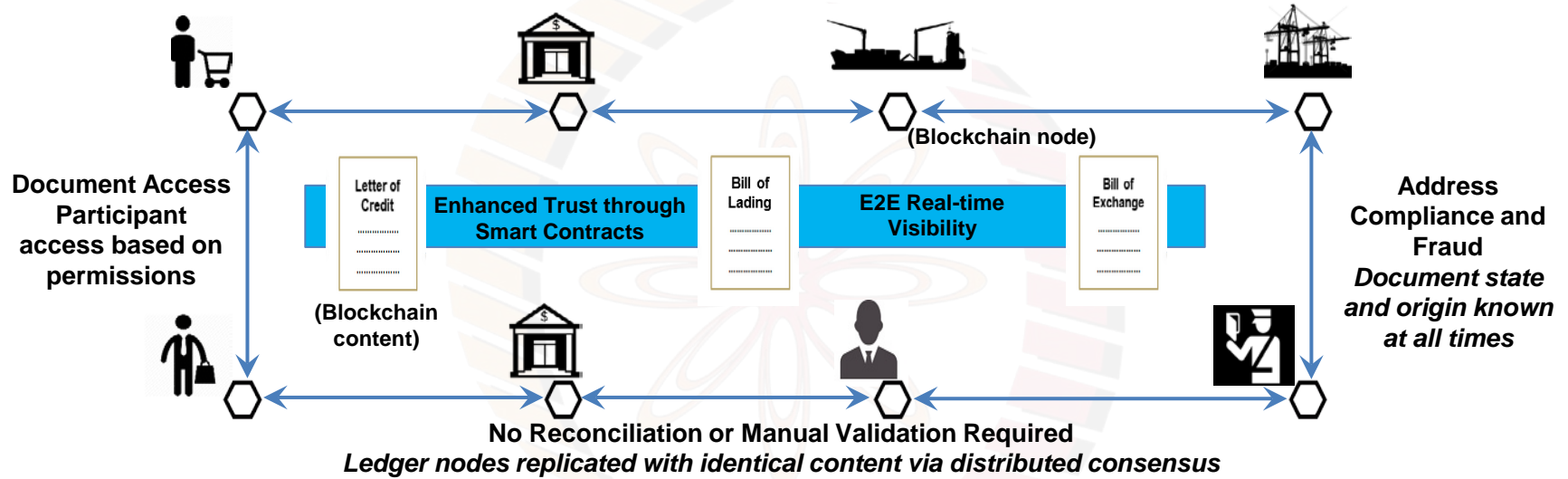
Risks

- Currency fluctuation
- Non-completion

Result

- Financing is expensive
- SMEs locked out

Blockchain Enabled Future State



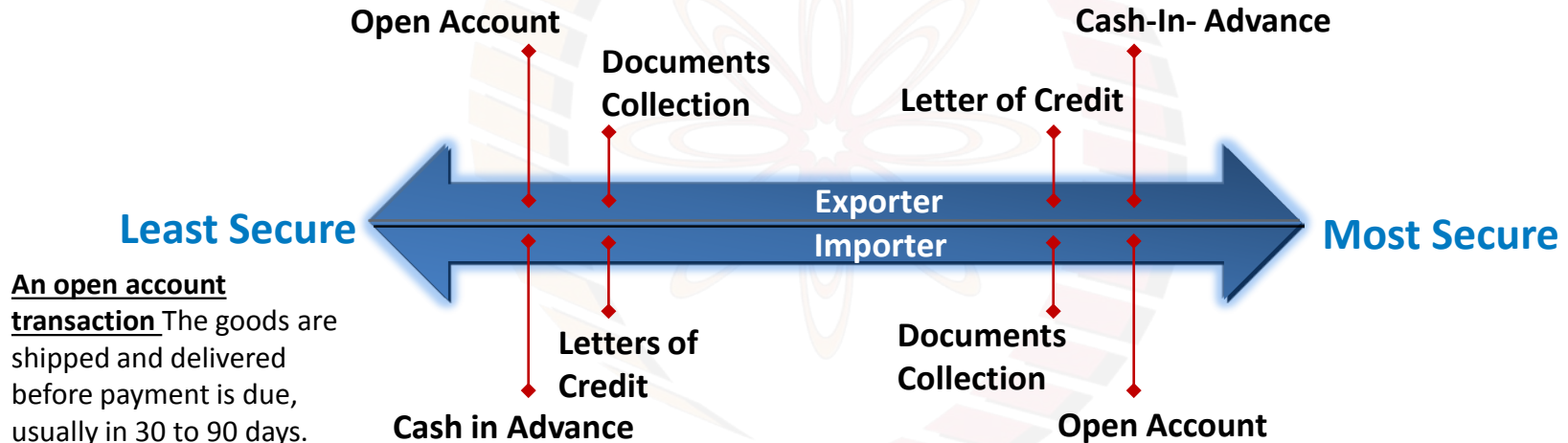
\$14T+ in global trade is financed

Upto 3 weeks for documents to be verified

\$37.6B potential cost saving by eliminating paper

Trade Finance Elaborated

Offers a means to convert export opportunities into sales by managing the risks associated with doing business internationally, particularly the challenges of getting paid on a timely basis



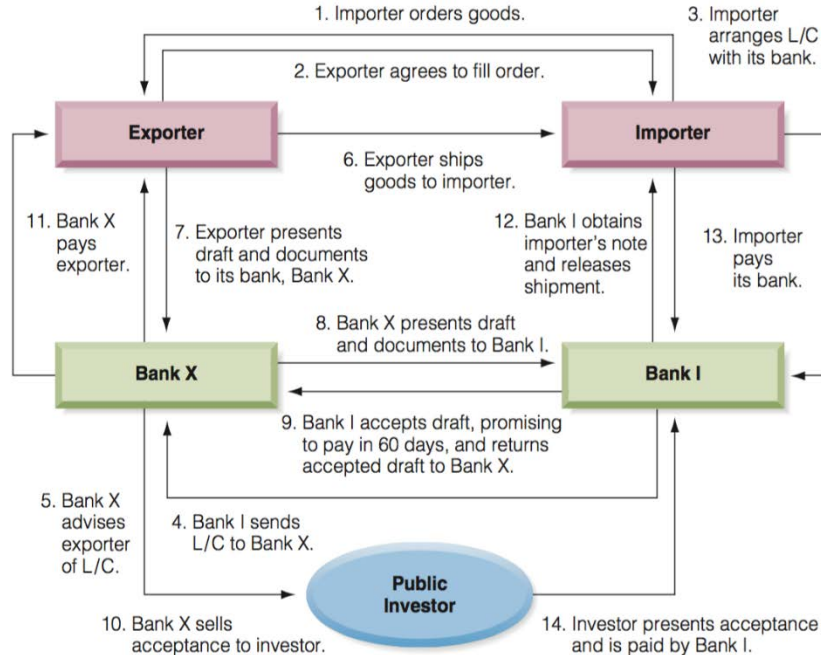
An open account transaction

The goods are shipped and delivered before payment is due, usually in 30 to 90 days.

Mitigation of non payment thru Export Credit Insurance

Trade Finance: Advantages Using Blockchain

Example Process Workflow



- Secure Shared ledger
 - **Unambiguous shared view** of contract terms & status of goods across importer, exporter, banks, common carrier, etc.
 - **Common store** of all documents (L/C, B/L, Drafts, etc.)
- Smart contracts simplify process & reduce cost/time
 - **Automation** of business workflow across organizational boundaries
 - **Improved transparency and accuracy** of process workflow
 - **Flexibility to model a variety of contracts** (revocable/irrevocable L/C's, confirmed/unconfirmed L/C's, time/sight drafts, bank/trade acceptances, etc.)

Formal documents: Letters of credit (L/C), Bill of lading (B/L), Drafts

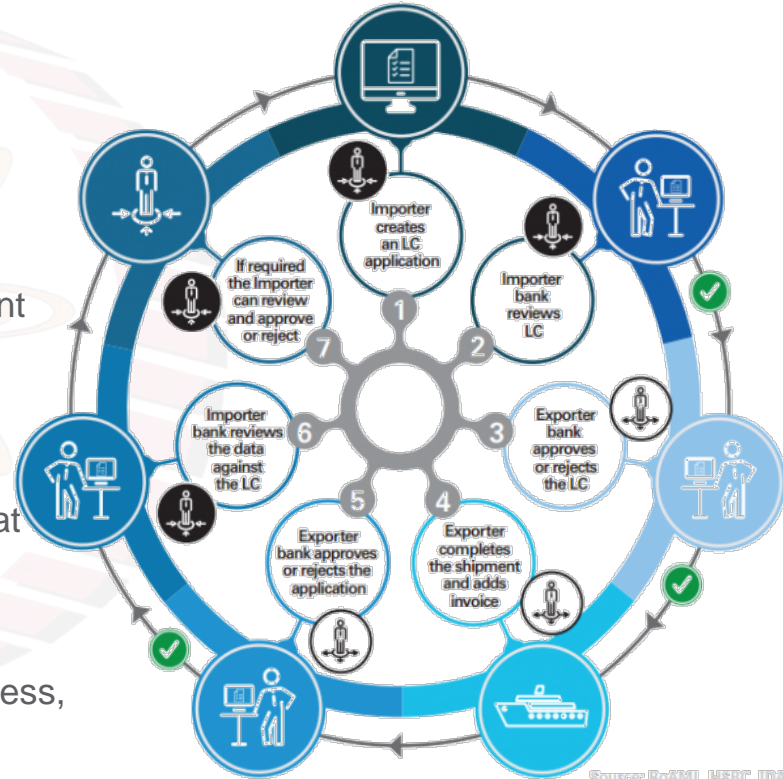
We.Trade: Trade Finance Network



- Digital Trade Chain (DTC), is a blockchain-based international trading system for a consortium of major world banks including: **Deutsche Bank, HSBC, KBC, Natixis, Rabobank, Société Générale, Santander, UniCredit and Nordea**
- Enables accurate trading posture information, order to settlement control, risk coverage, track and trace options
- <https://www.we-trade.com/>

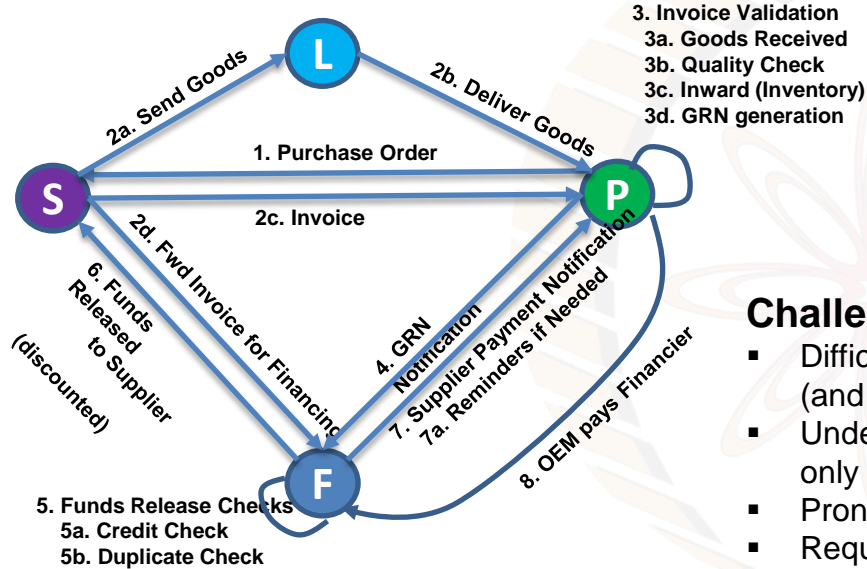
Benefits

- Near-real time exchange of information on a secure platform that digitizes transactional financing and other complex processes
- Continual business and compliance readiness in any regulatory environment
- Scalability that allows for rapid international expansion as business, regulatory, and security opportunities converge



Source: BoKMI, HSBC, IDA

Supply Chain Financing – As-is



Challenges:

- Difficult to obtain consistent view of status across all the entities (and hence lack of trust)
- Undertaking by Supplier not to submit invoice to two banks is the only mechanism to avoid double-spend
- Prone to errors during certain manual steps
- Requires multiple costly, ad-hoc point-to-point integration for automation of processes between Suppliers, Financier, and OEMs/Retailers/Purchasers
- In emerging geos like India, only a small fraction of potential marked is tapped by Financial Institutions

Blockchain Solution Roles/Responsibilities

Corporate Buyer



- Raise Purchase Order or Upload Digitized Purchase Orders
- See the status of Purchase Order/Invoice
- See the GRN Status

Supplier



- Respond to a purchase order by raising an invoice
- Raise ASN/Correct ASN based on 3PL's Dispatch Schedule
- Multiple Invoices against one PO is allowed
- See the GRN Status of the Shipped Goods
- See the invoice payment status

Corporate Receiver

Suppliers



- Receive the goods from the Logistic Player
- Check the reflection of the GRN Status on the ledger
- Record any rejected item from Production Lines or after quality check

3rd Party Logistics



- Publish Dispatch Schedule
- Record time of arrival
- Record time of receipt by Receiver
- Thus, provide proof of shipping commitments to the Supplier

Other Benefits

Financier



- Visibility into all purchase orders and invoices
- Visibility into GRN Status - this can be used for rich analytics
- See the invoice-financing advise details from purchaser
- Publish the event of approval of financing (without exposing internal mechanisms, if any, to take decision)
- Publish the event of payment made

Ecosystem Benefits

- Suppliers and Buyers -- Smart Contracts will eliminate the errors due to manual steps
- Suppliers and Financier -- Smart Contracts will result in automation benefits and reduced time to finance
- Buyer – Easy access to financing will improve Supplier Performance
- Financier -- Reduced time to finance will result increased financing duration
- Financier -- Transparent Orchestration will attract more Purchasers and Suppliers and increase the client base for the Financier

Fun Reading

- “Trade Finance and SMEs”, report by World Trade Organization:
https://www.wto.org/english/res_e/booksp_e/tradefinsme_e.pdf
- Streamlining Trade Finance with Blockchain (2 mins):
<https://www.youtube.com/watch?v=JEYO8RuS4fM>



thank you!