

Global Marketplace Design

Richard Olsen

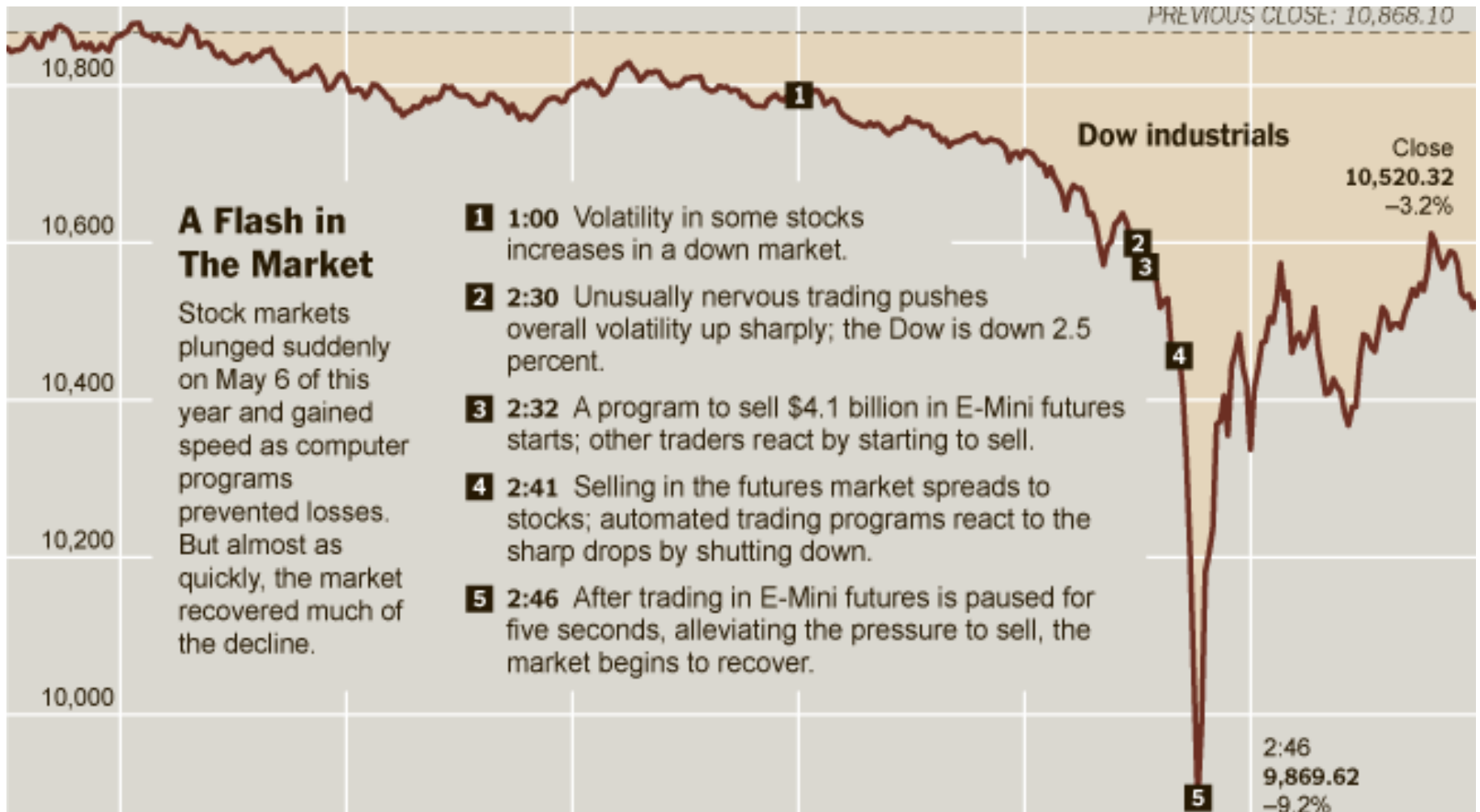


Today's financial system is a pile of spaghetti

- Organically grown financial system architecture
- Some workflows of financial transactions were computerized, but business processes remained almost unchanged
- Settlement and delivery of transactions are batch based with a time delay of 2 or more days
- Every bank has its own isolated bookkeeping system
- Verification of trades is cumbersome and prone to errors
- High degree of fragmentation and uncertainty in the market
- High transaction costs for financial assets
- Lack of liquidity and transparency in financial markets



Today's financial system is flaky: flash crash



Interest Rate Parity Works in Reverse

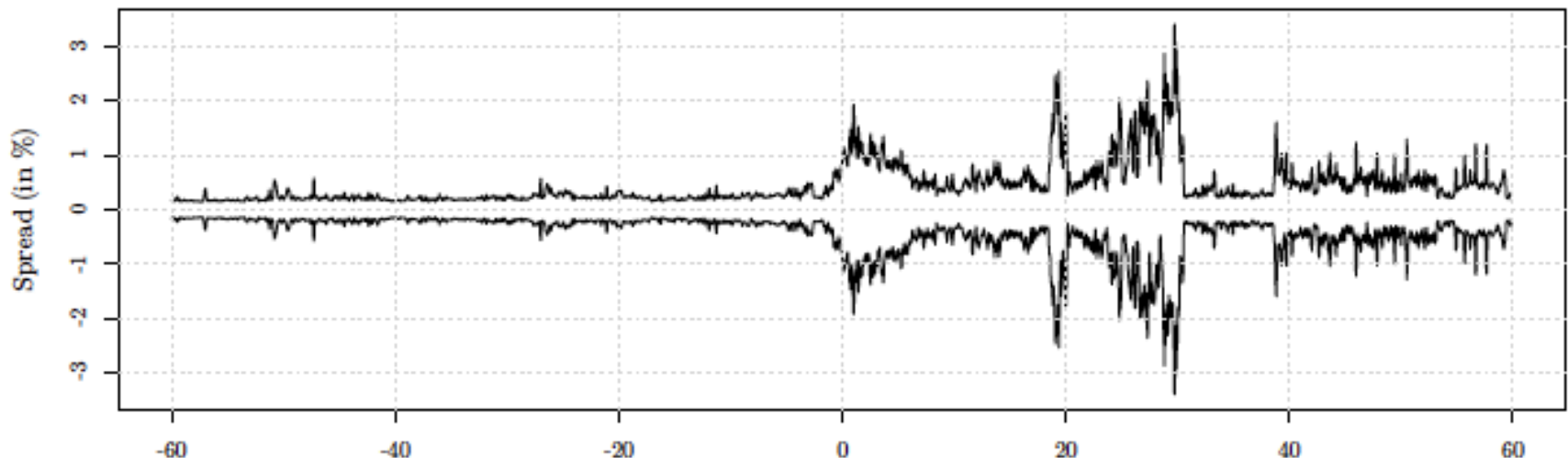
- Liquid markets: 98% of positions are opened and intra-day
- No interest is paid or received intra-day, because financial system is batch based with 2 day settlement
- Interest payments is incentive to take risk.
- If for technical reasons, no interest payments are possible, then mechanism works in reverse!



Spurious liquidity

- Bid-ask spread is measure of incentive to turn buyer into seller and seller into buyer.
- Spread is important:
 $0.01\% \text{ spread} * 100 = 1\%$
- Because there are no intraday interest rate payments, there is no incentive mechanism to reward liquidity provision.
- Liquidity is spurious....

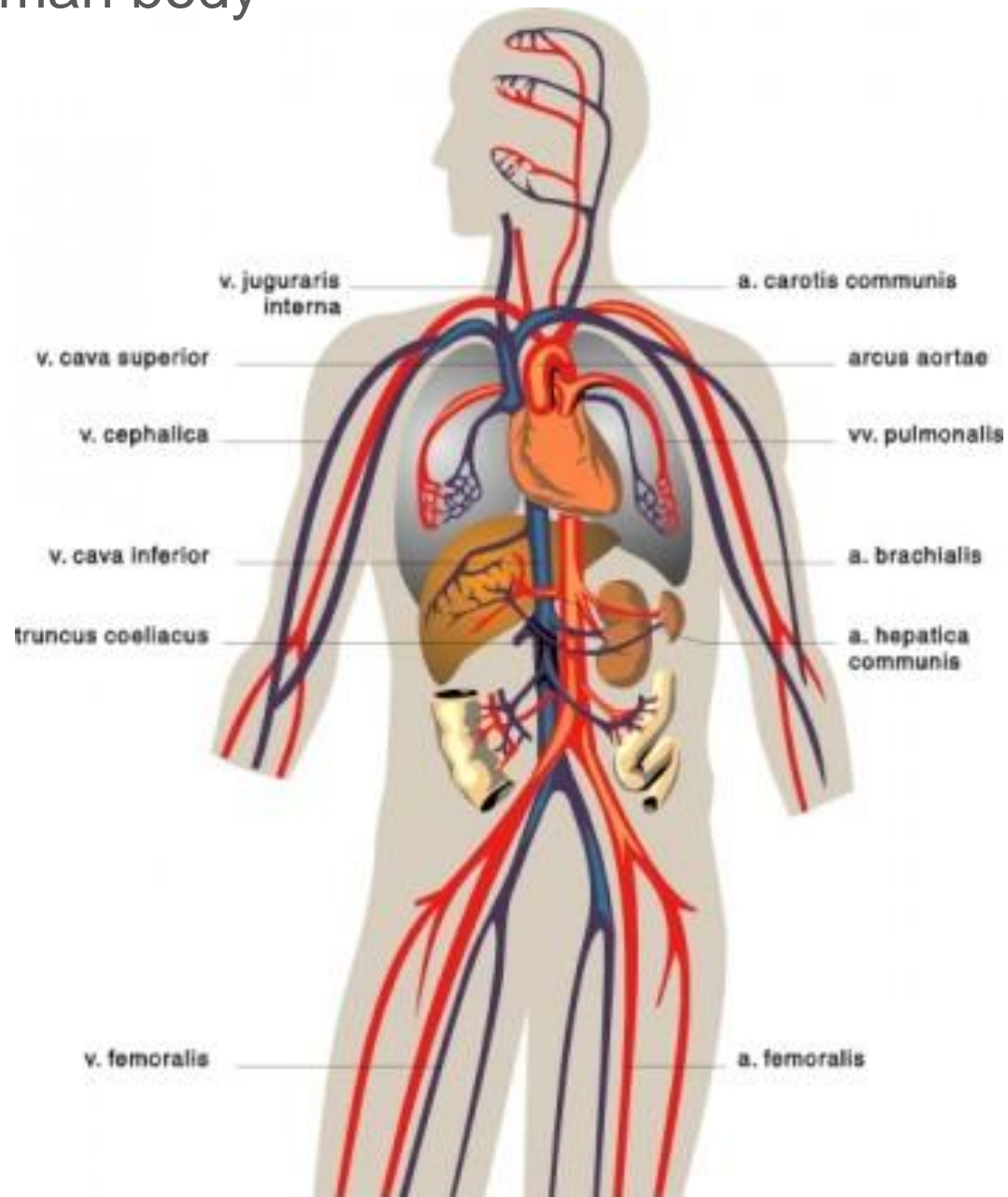
Exchange Spread



Economy is a complex system!



Analogy with human body



Analogy with human body

- Human body: 70 kg
- Blood: 4.7 to 5.5 kg
- 100'000 heart beats per day
- 55-85 ml of blood per heart beat
- 6'000 to 7'500 liters per day
- 42 to 52 liters every 10 minutes
- High blood circulation reduces peaks of toxic waste and offers seamless oxygen supply.
- Dynamic systems need high turnover for stability!



Key numbers of global economy

- 70 trillion USD annual global world product
- 210 trillion USD global financial assets
 - Stock market valuation 53 trillion USD
 - Public debt securities 45 trillion USD
 - Financial institutions bonds 37 trillion USD
 - Other securitized loans 23 trillion USD
 - Non securitized loans 51 trillion USD



Key numbers of FX markets

- 5.3 trillion USD per day
- 2 trillion USD spot transactions
- 2.3 trillion are swaps (arte fact of batch based system)
- 2 trillion USD / 86'400 seconds = 23 Mio per second
- 23 Mio USD is a just a trickle...
 - Volume of 0.5 Mio and less per second for minor exchange rates
 - Trader with 1 Mio of equity can place trade of up to 50+ millions USD
 - Price jumps trigger margin calls leading to cascading margin calls
- Stochastic events dictate price discovery and drives price levels away from equilibrium price for long periods of time.

Spot FX volume needs to increase by a factor of 350 to match blood circulation (we equate world annual product with body weight).



Global notary service will rewire financial system

The trust machine

There will be one internet based, decentralized notary service for all financial instruments with immediate global consensus about completed transactions and asset ownership

Benefits

- Globally secured property rights and direct ownership
- Safe, cheap and fast trading mechanism
- Direct access to global economic network because intermediaries are no longer needed
- Increased liquidity through incentives of intraday interests



Blockchain is a seminal
breakthrough!



Three fundamental components are implemented

1. **Global notary service = Blockchain**

All transactions and ownerships can be logged in this universally accessible distributed ledger

2. **Standardized securitization = Colored Coins**


Every financial instrument can be a listed security in the form of a digital token for recording in the blockchain

3. **Digital Signatures/Encryption = Wallet**


Every owner of a colored coin has direct ownership protected through a private key in his digital deposit box




Lykke in a Nutshell



Lykke builds a global marketplace with blockchain that is a level playing field and where everyone has access




Lykke Corp was founded by Richard Olsen in Zurich, Switzerland, and received the first seed funding in July 2015.



Lykke launches a centralized internet exchange – **LykkeX** – to trade all classes of financial instruments issued in a form of Colored Coins (Open Asset protocol) and ensure safe and immediate settlement



LykkeX employs a decentralized **Distributed Ledger Technology** to record all transactions and maintain a permanent register of ownership



Lykke Wallet is the first retail product of Lykke designed to provide a simple tool for personal ownership and direct trading of multiple assets



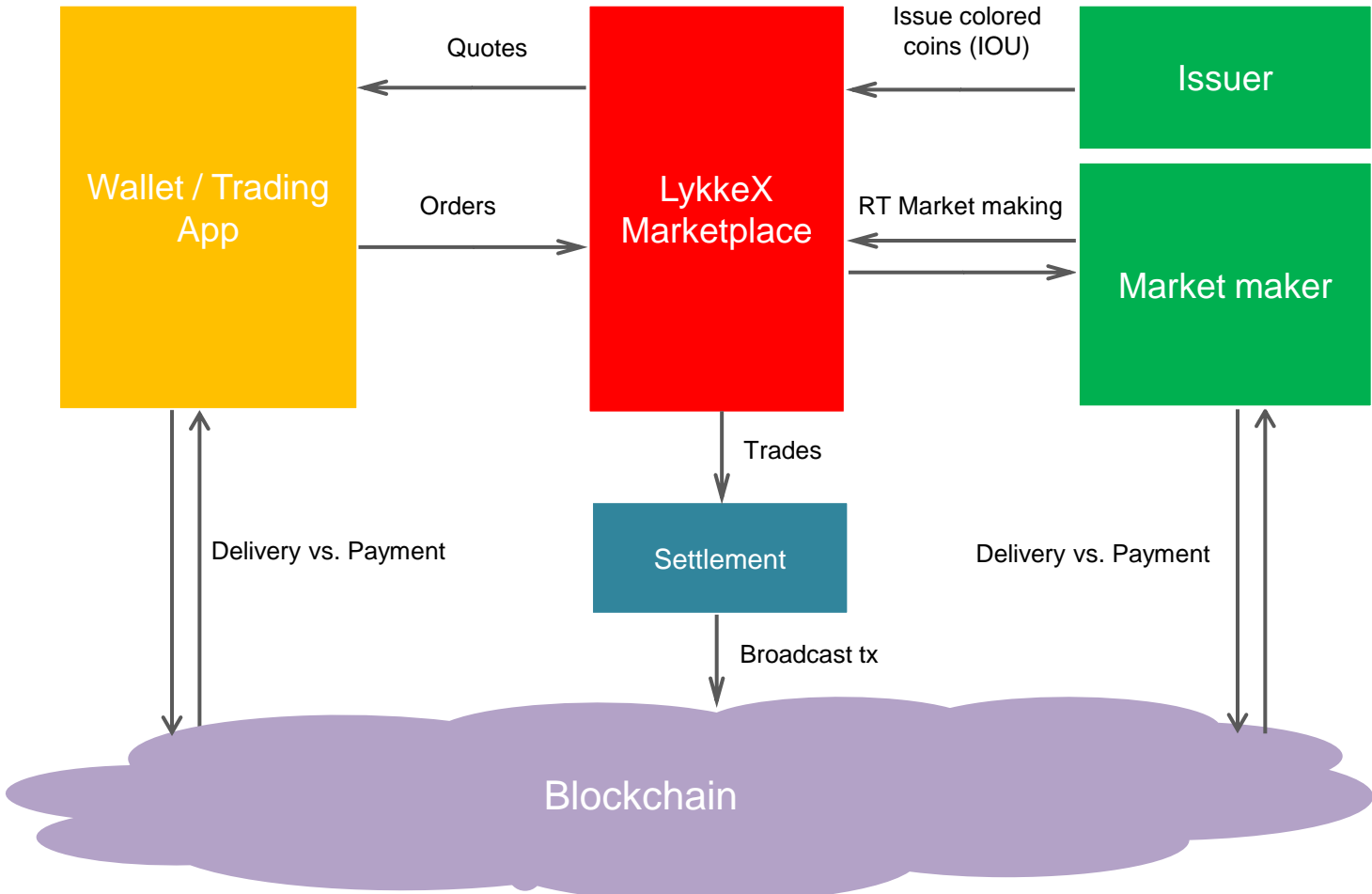
LykkeX Instruments Traded

LykkeX offer trading for all instruments and asset classes

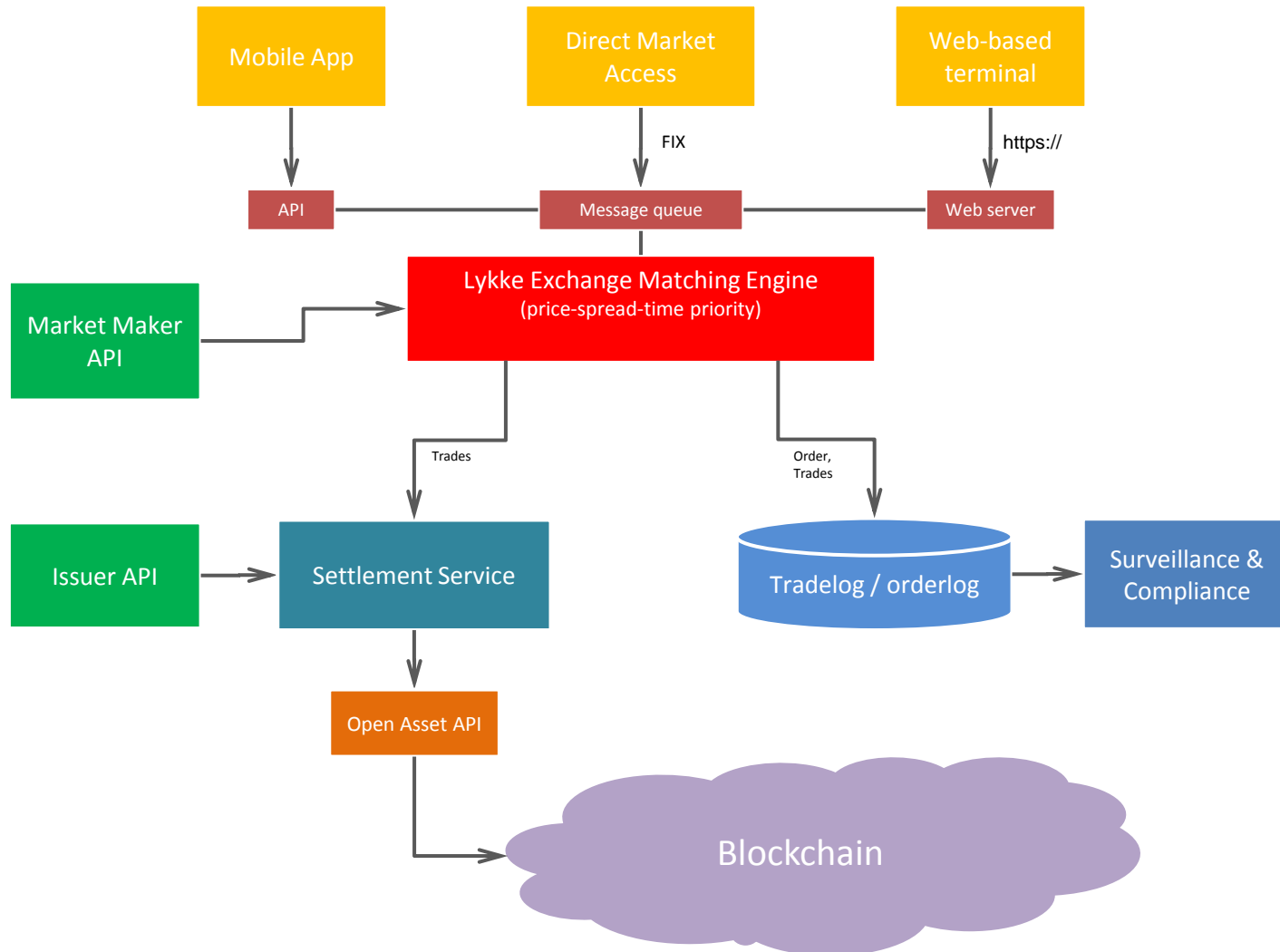
- Transferable securities
- Money market instruments
- Investment certificates of funds
- Options, Swaps, Foreign Exchange Instruments
- Derivatives



Exchange Cycle



Architecture



Tech Stack

Lykke Wallet
(iOS/Android/
Windows
Phone)

Lykke
Exchange
(C#.NET/
Azure)

Payment
Gateways
(Mastercard
Simplify)

Issuer
Gateways
(API)

Market
makers
(FIX)

Lykke Open Asset Protocol



Blockchain of Bitcoin



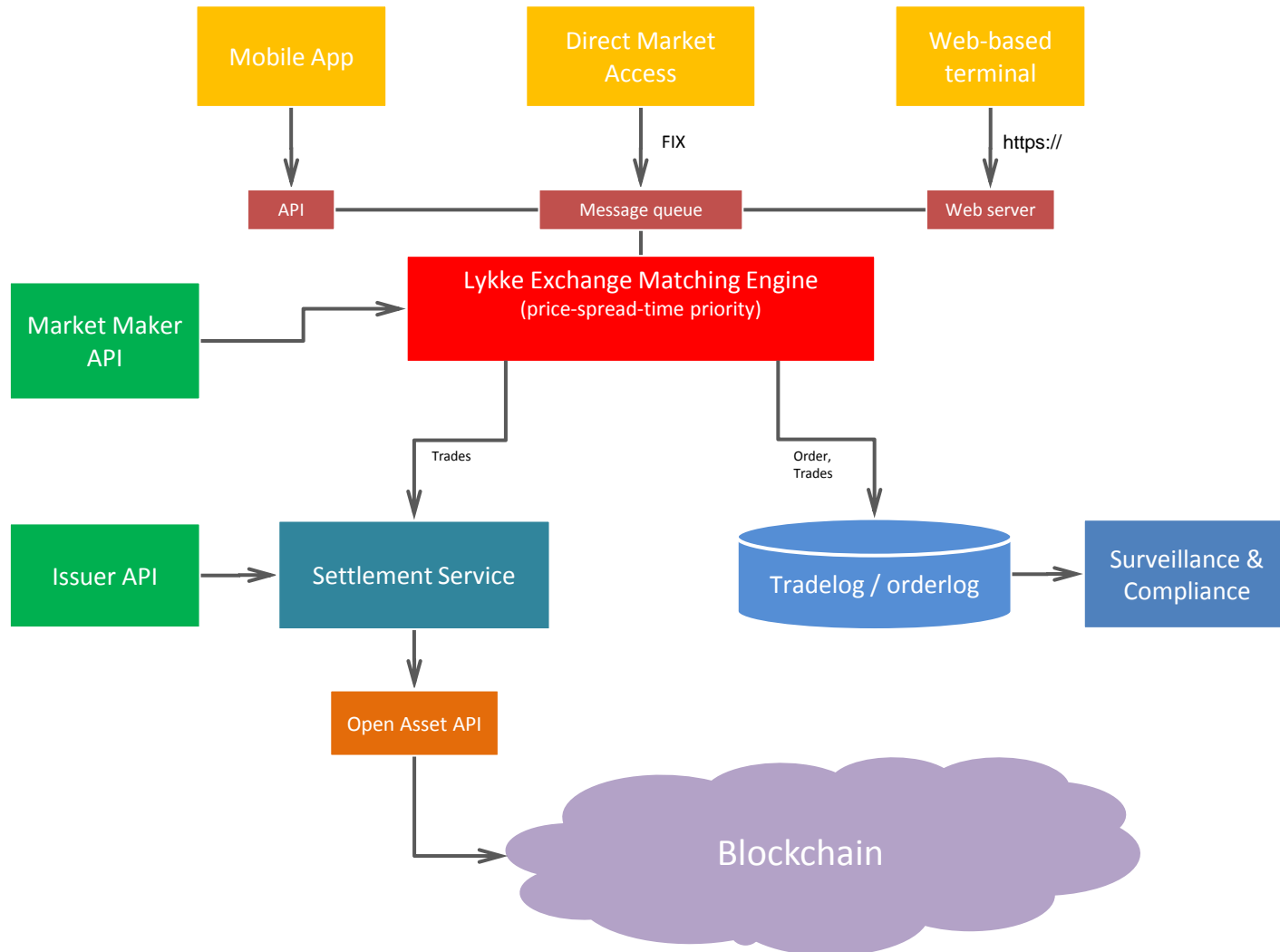
LykkeX marketplace transparency

The objective of Lykke is to build a global marketplace that offers a level trading playing field and provides everyone universal access

- Full pre-trade transparency with fully visible order books
- Full post-trade transparency with blockchain technology
- WikiFinpedia – real time information system with analytics
- Intraday interest rate payments
- Intraday fixings



Architecture



What is optimal design
marketplace?



Issuance of colored coins

- Issuer of colored coin buys 0.00001 Bitcoin
- Issuer uses Open Asset Protocol to specify 'I_Owe_You' of colored coin
- Bank XYZ issues colored coin of 100 EUR
- Holder of colored coin has right to redeem colored coin at anytime; Bank XYZ will pay 100 EUR with 2 day delivery
- Colored coin is 'at the run' zero coupon bond



Market design for colored coins?

- How to maximize likelihood of matching orders?
- Trick: 'diversity of time horizons of market participants'
- Coastline of price curve:
- 0.05% threshold: annual coastline 1600%
- 0.1% threshold: annual coastline 800%
- 0.2% threshold: annual coastline 400%
- 0.4% threshold: annual coastline 200%
- 0.8% threshold: annual coastline 100%
- 1.6% threshold: annual coastline 50%
- 3.2% threshold: annual coastline 25%



Trading of colored coins

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- <https://www.coinprism.info/asset/AXZSdEghQ8u4pHw1xPKUUmngQjqyKTMMb9/owners>

