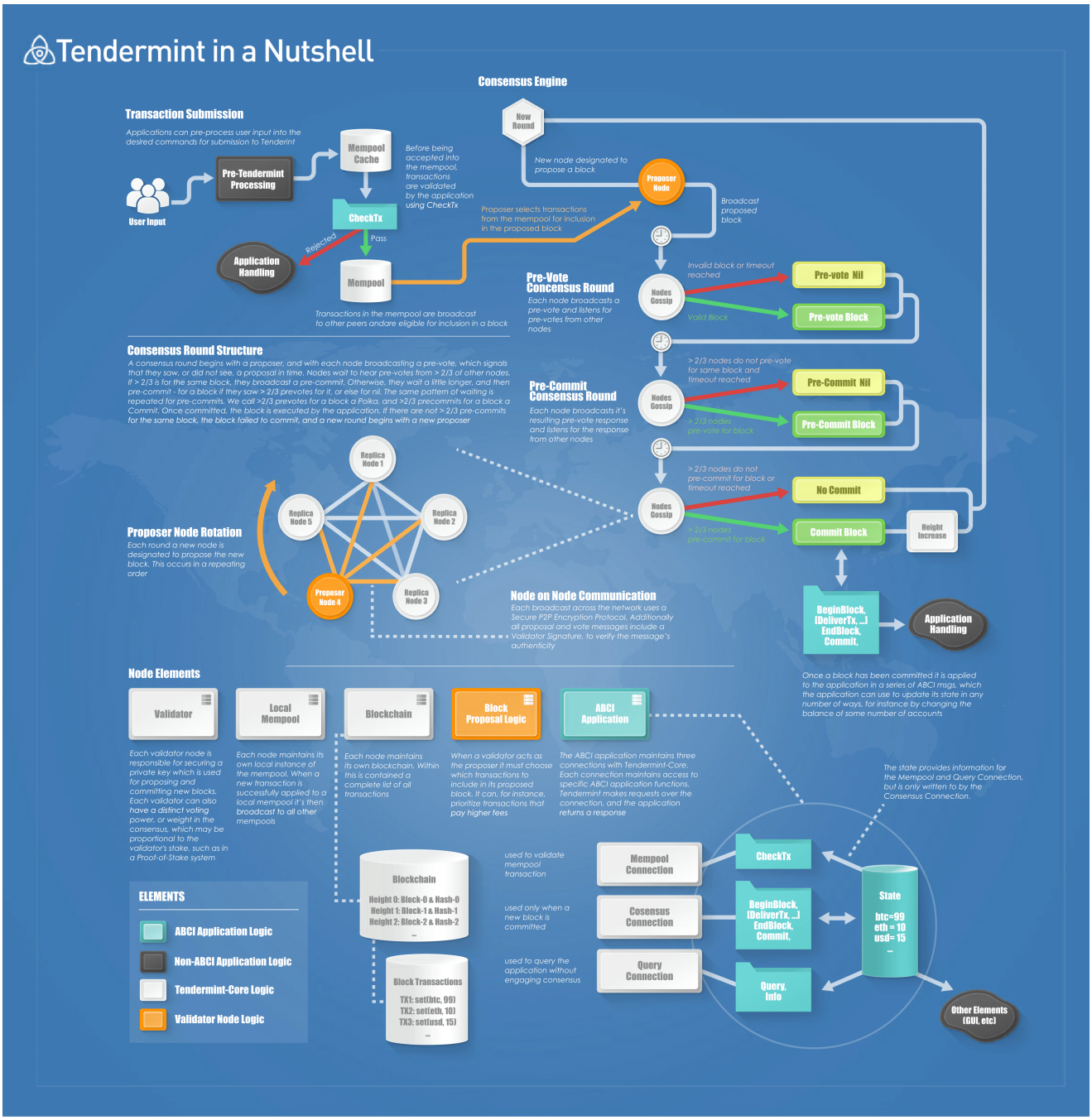
Infographics:

- Tendermint in a Nutshell.
- Ethereum
- IPFS
- QR Codes
- QR vs NFC



A BEGINNER'S GUIDE TO ETHEREUM

1 Introduction

Over the last few years, developers have begun using Bitcoin's underlying technology - the Blockchain - for creative new applications. Ethereum is a next-generation platform that allows anyone - both developers and consumers - to easily take advantage of decentralized networks and realize the benefits of blockchain technology.

2 What are Decentralized Networks?

Decentralized networks redistribute functions and powers away from a central server, enabling peer-to-peer communication.

Advantages:

- No central point of failure
- Highly reliable
- Cost-effective

BitTorrent, used for file sharing, is an example of a decentralized network.

3 The Blockchain

Most networks function using a central authority to make final decisions. The blockchain, a type of decentralized network, is able to make agreements across the whole network, without any central authority.

Bitcoin uses Blockchain technology to record and verify transactions without the need for a central bank.

4 ENTER ETHEREUM

Ethereum's vision is to decentralize the internet by creating a platform where applications can be built and run on a decentralized network. Ethereum is fast and flexible without the inherent limitations of the Bitcoin protocol.

> **What Bitcoin does for payments, Ethereum does for anything that can be programmed**

5 Ether

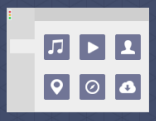
Ether is the native token of Ethereum, and serves two key purposes. First, by requiring applications to pay ether for every operation they perform, broken or malicious programs are kept from running out of control. Second, ether is given as a reward to those who contribute their resources to the decentralized network.

Ether: The "fuel" that runs the Ethereum network

6 Mist

Mist will be Ethereum's end user interface to bring blockchain technologies to non-technical users.

It will include a catalog for decentralized applications and an assortment of other tools.



Mist will work similar to app stores and browsers that consumers are already familiar with.

7 What will Ethereum be used for?

Decentralizing Existing Services

Services that are traditionally centralized can be decentralized using Ethereum. This will lead to reduced costs and fees by connecting individuals directly and removing 3rd parties.

Imagine a service like Uber or eBay without a company in the middle collecting fees!

Bringing Science Fiction to Life

Using Ethereum, IBM and Samsung worked on a proof of concept where a washing machine could:

- order its own detergent when it runs out
- call its own repairman when it breaks down
- do the laundry when electricity is cheapest!

Unimagined Possibilities

The creators of the internet didn't anticipate social media or cloud computing. We have no way of predicting which breakthrough technologies will be born on the Ethereum blockchain!

8 What is being built on Ethereum?

WeiFund	Decentralized crowdfunding platform.
airlock	Access protocol for smart property and the Internet of Things.
PROVENANCE	Project to increase the transparency and accountability of supply chains.
augur	Decentralized prediction market platform.

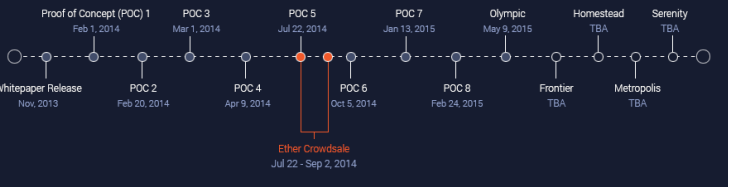
9 Funding the Vision

On July 22, 2014, the non-profit Ethereum foundation launched a public crowdsale of Ether. The funds collected have helped carry out the development of the project. The sale lasted for 42 days and raised 31,591 BTC, or $18,439,086, making it (at the time) the largest completed crowdfunded project of all time.

Crowdsale Numbers

42 Days	31 Thousand BTC Collected	$18 Million Equivalent	
3rd Largest Crowdfunded Project in History (current)		9 Thousand Participants	

Ethereum Software Release Dates



IPFS

"The interplanetary file system(IPFS) is peer-to-peer hypermedia protocol to make the web faster, safer, and more open."

Three types of computer networks exist today

centralized

Single point of failure.

decentralized

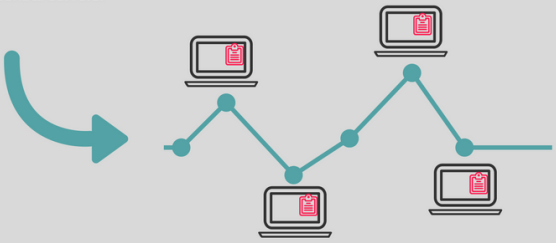
Destruction of a small number of central nodes could lead to failure.

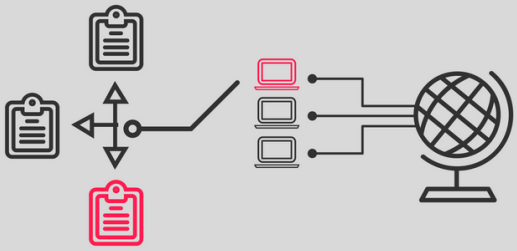
distributed

No single point of failure.

The IPFS way of storing data in a network.

Files get stored and shared trough the computer network, without the use of central servers.

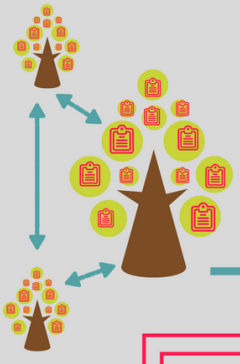




Each file on every computer is given a unique fingerprint called a cryptographic hash.

QmbUSy8HCn8J4TMDRRdxCbK2uCCtkQyZtY6X

IPFS refers to everything by the hash



Each hash function refers to other files creating a map of the entire data structure called merkle tree.

Every merkle tree points to any other tree. This way content in the network gets addressed.

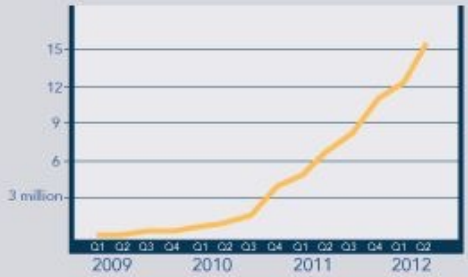
www.blockchainhub.net

Decoding QR CODES

the whole brain group

WHY USE QR

By strategically using QR codes you can increase traffic to your website, generate more leads, and thereby increase your potential for growth.



Scan rates are steadily on the rise, with a record *5.3 million* scans in June of 2012 alone*

*Source: Scanlife.com

TYPES OF QR CODES

Different types of content can be embedded in different QR codes. Here are some of the most common:

- Twitter Profile
- YouTube Video
- Phone #
- Facebook Profile
- SMS
- Contact Info.
- E-mail address
- Web URL
- Text
- Map

Note: Not all QR code generators do everything - try different websites for more options

WHERE TO USE THEM

- Business cards
- Brochures
- Merchandise
- Signage

Be creative!

Scan us!

Scan the code at the right to receive weekly updates from our blog! The latest internet marketing news and trends delivered straight to your inbox.

designed by: www.thewholebraingroup.com

QR vs. NFC

QUICK RESPONSE CODE — NEAR FIELD COMMUNICATION

Which will reign supreme in the battle to replace your credit card?

QR CODES (Quick Response Codes)

Mobile payment system: mobile devices' cameras scan a code to unlock the user's payment information and complete a transaction

NFC (Near Field Communication)

Mobile payment system: enables radio connection from one device to another

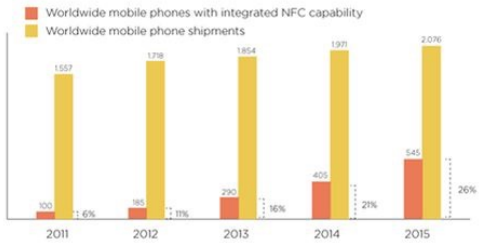
EMV compliance
Ensures usability/accessibility for NFC mobile payments

NFC and QR Code Usage

NFC usage

One study shows an expected growth of NFC usage by **38% between 2011 and 2016**
In 2016, the NFC market expected to reach more than 10 billion dollars

By 2015, more than a quarter of all mobile devices will be NFC-enabled



QR Code Usage

Only **9% of US adults used a QR code** in 2012
While QR code usage is increasing, the overall percentage of smartphone users leveraging this technology has dropped

US Adult Mobile Barcode Users and Penetration, *2011-2014*

	2011	2012	2013	2014
Adult Mobile barcode users *(millions)*	**21.2**	**26.3**	**32.4**	**38.5**
% change	146.9%	24.4%	23.2%	18.7%
% of adult smartphone users	25%	25%	26%	27%
% of adult mobile phone users	10.1%	12.4%	15%	17.6%
% of adult population	8.9%	11%	13.4%	15.7%

Apple: Betting Against the Industry

Apple is the only major player in the mobile device industry that does not offer any products with an NFC chip. *This could be a big roadblock for merchant adoption of NFC*

Possible reason #1: NFC security

Security issues come from traditional wireless network attacks

Another possible security problem
Users can generate their own near field tags. Some tags can be activated passively

Possible reason #2: Apple often waits

"Time and time again, Apple has lagged behind the vanguard of the industry in adopting the next big thing." *Nikhil Bobb, former Apple file system engineer*

Possible reason #3: Cost

During manufacturing of the iPhone 5, one NFC controller cost about **$5/unit**

$5/unit would have added about **$125m to Apple's costs**

Possible reason #4: QR

QR is already integrated with Apple iOS

Passport uses QR to organize membership cards, boarding passes, event tickets and much more

Major Players Leveraging QR Codes/NFC in the Battle for your Mobile Payments

= *Hardware Requirements*

1 ISIS

Merchants & Financial Institutions

1,000 participating merchants to date
Isis is only active in Austin, TX & Salt Lake City, UT so numbers are small

NFC enabled terminals

General information
- National mobile commerce venture
- Backed by AT&T, T-Mobile and Verizon
- Software-based mobile wallet
- Organizes credit and debit cards, loyalty cards and special offers in one app
- Contactless payments through NFC
- Allows merchants to engage with customers via mobile
- Will enhance merchant marketing programs
- Has been tested in Salt Lake City and Austin
- Plans to launch nationwide in 2013

2 PayPal

Merchants & Financial Institutions

Nearly **20 million PayPal Mobile users**
As of 2013: 23 national retailers accept PayPal payments in stores

For consumers: **works on iPad, iPhone, Blackberry and any Android device**
For retailers: **A free card reader and/or PayPal's Pay Here app can be used to process cards or checks**

General information
- Enables consumers to manage finances through mobile devices
- Allows for PayPal's "Bill Me Later" option to be used for mobile purchases
- Current versions allow easy flexibility for in-store payments
- The "Shop" feature allows consumers to locate places where they can use their PayPal app

3 Google wallet

Merchants & Financial Institutions

Any store that supports NFC payments
Over **200,000 merchants** in the US

NFC enabled terminals

General information
- Users can store credit and debit information on the app
- Payments are made through NFC technology
- Free and compatible with devices that are NFC enabled
- Cloud-based version supports credit and debit cards from Visa, MasterCard, AmEx and Discover
- Drive the right traffic to merchant's stores
- Retain more customers
- Merchants are featured on Google's "Where it Works" map

4 Paydiant

Merchants & Financial Institutions

- Paydiant is currently working with leading issuers, networks, acquirers, retailers, banks and credit unions
- In September 2012, Bank of America launched a test cycle with Paydiant
- In August 2013, Pulse announced a partnership with Paydiant that will include all of its retail partners and financial institution participants

Options for loyalty, offers & discounts

Users can use Paydiant to redeem offers at POS

QR codes at POS

General information
- Paydiant is the only mobile wallet and payment platform that works with existing payment tools: PIN debit, credit, signature debit, prepaid cards
- There are no third-party apps
- Free and compatible with all Apple and Android devices
- Paydiant keeps payment card numbers and cardholder data securely stored in a certified data center
- Paydiant offers a more convenient way to pay
- Allows merchants to engage with customers mobily

5 LevelUp

Merchants & Financial Institutions

Within a year of launch: LevelUp had over **3k merchants and 200k consumers** using the product

Average users make 2-3 LevelUp purchases/week

Strictly QR code based. Works for iPhone, Android and Blackberry

General information
- Operates on the premise that mobile payments should be easy and free for merchants and consumers
- 2012: stopped charging merchants for payment processing
- Consumers credit or debit cards are associated with a unique QR code

Looking to the Future

Estimates for 2017:
1.5 billion smartphones will be used globally

US mobile consumers will spend
$90 billion on mobile payments

50% of smartphone users say they will use their mobile wallets *for daily transactions by 2016*

Sources:
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