

THE BLOCKCHAIN INTERFACE COMPANY



# HOW TO BRIDGE THE DIGITAL-PHYSICAL GAP

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MÜNCHNER KREIS: BLOCKCHAIN CONFERENCE, MUNICH, NOV 23



FROM A BOX OF PILLS TO A CONNECTED DEVICE,  
EVERY OBJECT (IN THE IOT FUTURE) NEEDS TO HAVE A  
**TRUSTED**  
**DIGITAL IDENTITY.**

#

**THIS IS THE (ONLY) BASIS FOR ANY TRANSACTION OR  
DIGITAL COMMUNICATION IN DECENTRALIZED NETWORKS  
THAT INCLUDE MACHINES & SENSORS / ACTUATORS –  
SINCE THE SOURCE OF DATA NEEDS TO BE**

**RELIABLE & TRUSTED**

**SUCH A TRUSTED PLATFORM ABSOLUTELY NEEDS TO  
PROVIDE AN END-TO-END-SOLUTION, THAT SOLVES THE  
PROBLEM OF SECURING DATA ON THE  
FIRST/LAST MILE.**

# SELF SOVEREIGNTY

**MEANS. HARMONIZING HUMAN & MACHINE IDENTITIES.  
GIVING IDENTITIES TO EVERYTHING BY  
CRYPTOGRAPHIC MEANS**

**#**

*Riddle & Code*<sup>®</sup>

# IDENTITY EQUALS BLOCKCHAIN WALLETS

HARMONIZING HUMAN & MACHINE IDENTITIES. GIVING  
IDENTITIES TO EVERYTHING.

#



**TO MAKE IDENTITIES SECURE & RESILIENT,  
WALLETS HAVE TO BE SECURED OR HARDENED**

**CRYPTO-OFFLOADING  
KEY PROTECTION  
ACCELERATION  
DEVICE HARDENING  
RESILIENCE**

**AND WE ARE NOT TALKING SOFTWARE OR ALGORITHMS HERE**

**#**

# HACKING A CRYPTO PROCESSOR (ONLY SOME METHODS)

**STEAL THE KEY**

**PHYSICAL TEMPERING**

**GET PHYSICAL ACCESS FOR PROBING**

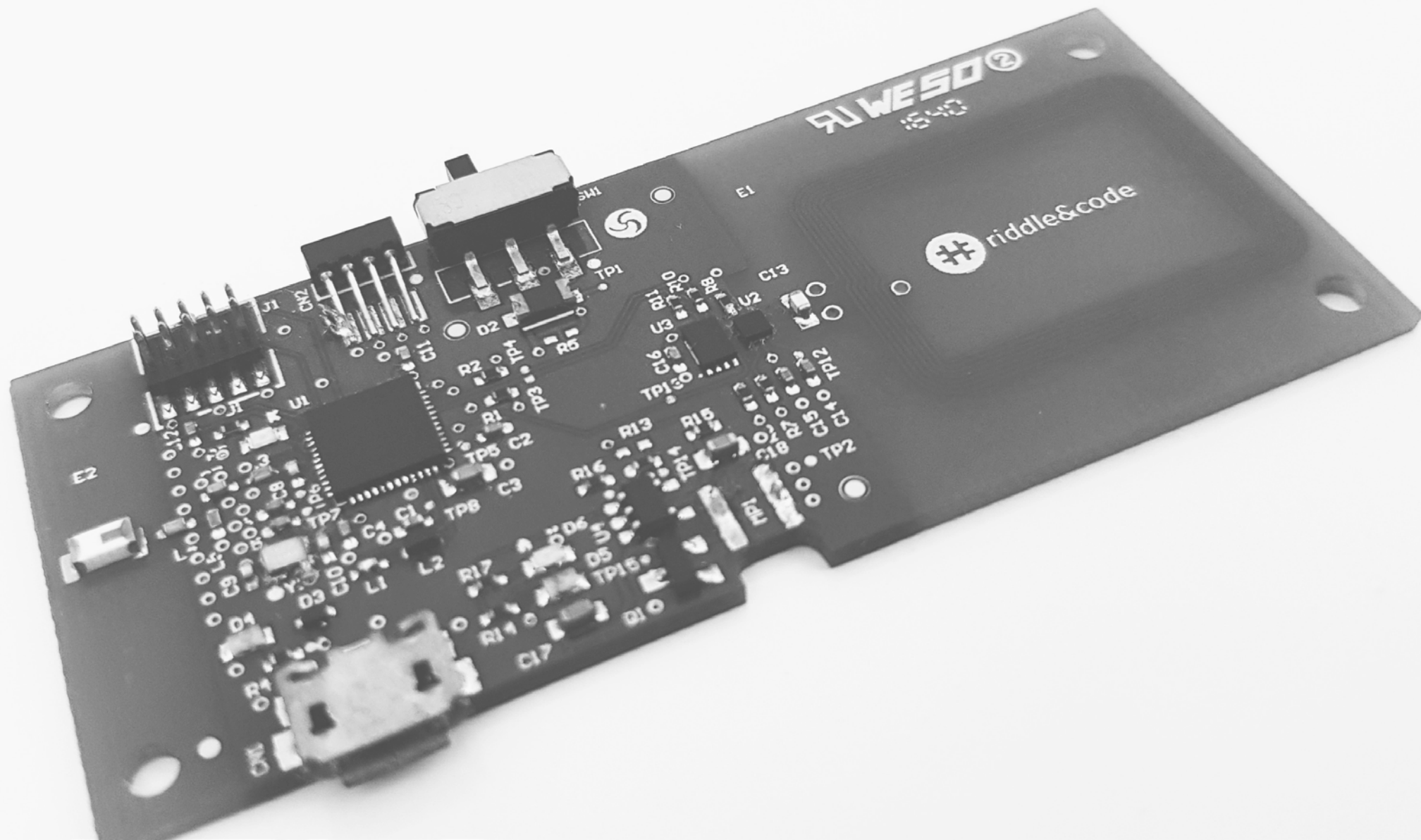
**MEMORY REMENANCE**

**FROZEN RAM**

**MONITORING RF & ELECTROMAGNETIC**

**SIGNALS**





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# PROBLEMS RIDDLE & CODE FIXES



## LEGACY SECURITY SOLUTIONS

e.g. SECURE (HARDWARE) ELEMENTS

### THEY LACK:

- > DIRECT LINK TO THE BLOCKCHAIN FOR END-TO-END DATA
- > SECURITY AGAINST SOME HARDWARE HACKS
- > COMPLEX IDENTITY MANAGEMENT
- > CRYPTOCURRENCY WALLET BACKENDS

etc.

## BLOCKCHAIN-ENABLED HW

FAMILY OF SPECIFICALLY DESIGNED CRYPTO CHIPS

### WE PROVIDE:

- > CRYPTO CHIPS TO EMBED IN ANY PHYSICAL GOOD
- > SOFTWARE SOLUTIONS FOR STANDARD CRYPTO TAGS
- > ALL OUR HW IS TIED TO (A) BLOCKCHAIN
- > IT USES ENERGY HARVESTING AND ARDUINO
- > WE PROVIDE HIGHLY OPTIMIZED IoT MIDDLEWARE
- > WE OWN VERY BROAD PATENTS
- > WE WORK ON POCs AND FIRST PRODUCTS:
- > IOT, SUPPLY CHAIN, FINANCE, SMART CITIES, eMOBILITY...



# PLATFORM OVERVIEW

BLOCK-CHAINS

Bitcoin

BigchainDB

IPFS

Ethereum

IOTA

INTERFACE  
LAYER

#



SOFTWARE

#

PATENTED SOFTWARE ENABLES COMMUNICATION PROTOCOLS

PKI

BLE

I2C

LORA

SIGFOX

QR

NFC

THREAD

LPWAN

CRYPTO HARDWARE

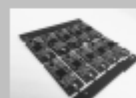
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HALFBEAN



ARMULINO



FULLBEAN



SMART TAG

HARDWARE GETS EMBEDDED



IoT Device



Package



Vehicle



Sensor



HW Scanner



Documents



Smart Lock



Medical HW



Wearables



Container



Wallet

#

# HOW DIFFICULT IS IT TO START?

**SECURING ALL PHYSICAL GOODS**

**MAXIMUM SECURITY BY EMBEDDING CHIPS**

**RUNNING EFFICIENT PoCs**

**GOOD ENOUGH SECURITY: CRYPTO TAGS**



# GENERAL BACKEND ISSUES

## WALLET INTEROPERABILITY

COLD & HOT WALLTES BY RIDDLE&CODE

## MULTI-PARTY IDENTITIES

ENABLED BY OUR SOLUTIONS





# GENERAL USE CASE DIFFERENTIATION

**MAXIMUM SECURITY NEEDS?**

**CRYPTO BLOCKCHAIN HW CAN HELP.**

**MULTI-PARTY TRUST NEEDED?**

**THE BLOCKCHAIN CONNECTION HELPS**





# USE CASE DIFFERENTIATION: SUPPLY CHAIN

**SECURING THE DEVICE ITSELF**

**BY EMBEDDING BLOCKCHAIN HARDWARE**

**SECURING CONTAINERS**

**BY ATTACHING SMART 'CRYPTO LOCKS'**





# HOW TO: SMART BUSINESS COMPONENTS

## CRYPTO PAPER

Securing Document Paper

By embedding a crypto tag into official blanko paper, we enable (public) authorities to allow documents to have all the advantages of digital files. Physical tokens are issued to correspond to the tagged paper. As a result, paper documents will be registered on the blockchain and can't be forged anymore.

## CRYPTO WALLET

Enabling Wallet Interoperability

Our crypto (cold) wallet backends allows to set up infrastructures to exchange transactions of different crypto currencies in an interoperable way – a business pre-requisite for many IoT & Sharing Economy cases

## SMART LOCK

Enabling Secure Supply Chains

Smart Locks will be a major asset for many end-to-end systems in the logistics space – where a higher level of transport security is needed. Smart locks will not only help to lock containers or packages of all kind, but will be complemented by tokens of ownership & smart paper documents to fully prove ownership.

## SMART PLUG

Personalized and Secure Plugs

Smart Plugs are going to solve several problems at once: They will make power plugs mobile, interoperable (adapter function) and enable the automated settlement of energy transactions or consumption (trading or payment), giving decentralized energy networks the necessary versatile business functions needed.







# OTHER RELEVANT ASPECTS

**PROOF OF PROVENANCE**

**FOR MACHINES, ART, LUXURY GOODS**

**PROVING NETWORK INTEGRITY**

**CREATING TAMPER-PROOF IDENTITIES**

**SELF-AUDITING PLATFORM OF TRUST**

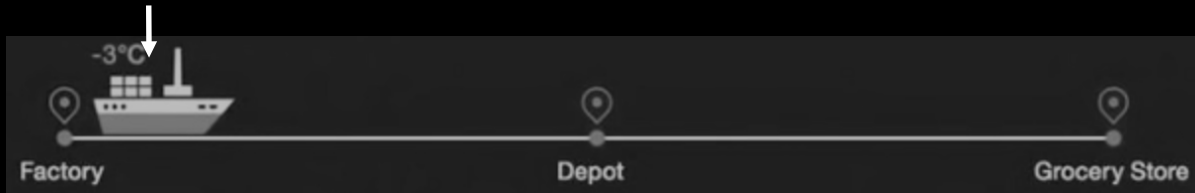




# EXAMPLE: LOGISTICS SECURITY

## MONITORING TRANSPORT CONDITIONS

RIDDLE&CODE chips get embedded into relevant sensors

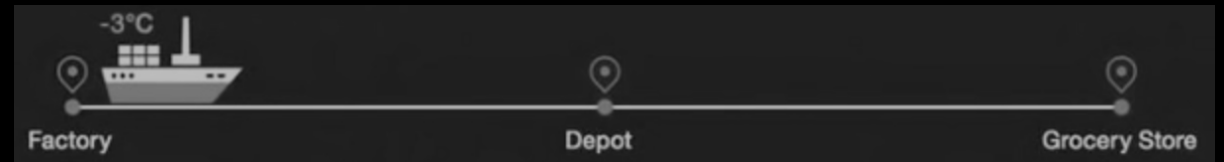


RIDDLE&CODE hardware provides sensors with a unique, tamper-proof digital identity, securing the provenance of the sensor and certifies all data transmitted by blockchainifying them.

## REGULATING ACCESS TO FREIGHT.



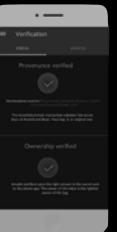
RIDDLE&CODE chips get embedded into the containers' padlock, making it uncompromisable.



The owner can be provided with a physical token or documents with embedded smart tags that are connected to the blockchain, allowing him to:



- Access information about the freight / container
- Option to trade the freight / settle payments
- The contents of the container as their certified owner.



As an additional security measure, when shipping the container the token and container travel through different channels and the containers can only be opened when the two are coming together again.





# SECURING TRADING DOCS

A container shipped from Africa to the port of Rotterdam needs up to 200 documents. This means a lack of efficiency, and open doors for fraud and document manipulation.

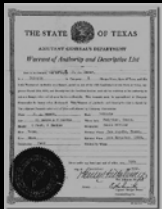


RIDDLE&CODE links the physical with the digital world in one solution, enabling trust while still allowing paper documentation. This is done by combining the following three technologies to form a micro computer:

- A micro-controller – that can run blockchain algorithms
- A crypto-accelerator (WiseKey – VAULT IC)
- Active NFC transponder is also embedded into the paper

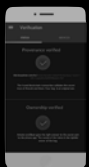
## ADVANTAGES:

- Guarantees security and trust in international trade
- Transfer of digital security into physical paper
- Possible creation of new business models based on tokenized inventory
- Auto-fulfillment of deals based on the combination of DLT & Smart Contracts



Due to advances in miniaturization this crypto computer can be embedded into the paper to act as a tag.

If someone peels it off, the antenna breaks and the chip gets destroyed. Therefore the document gets de-validated.



The energy needed to enable NFC is harvested from ordinary mobile phones via induction when the phone is used as a reader or a writer.



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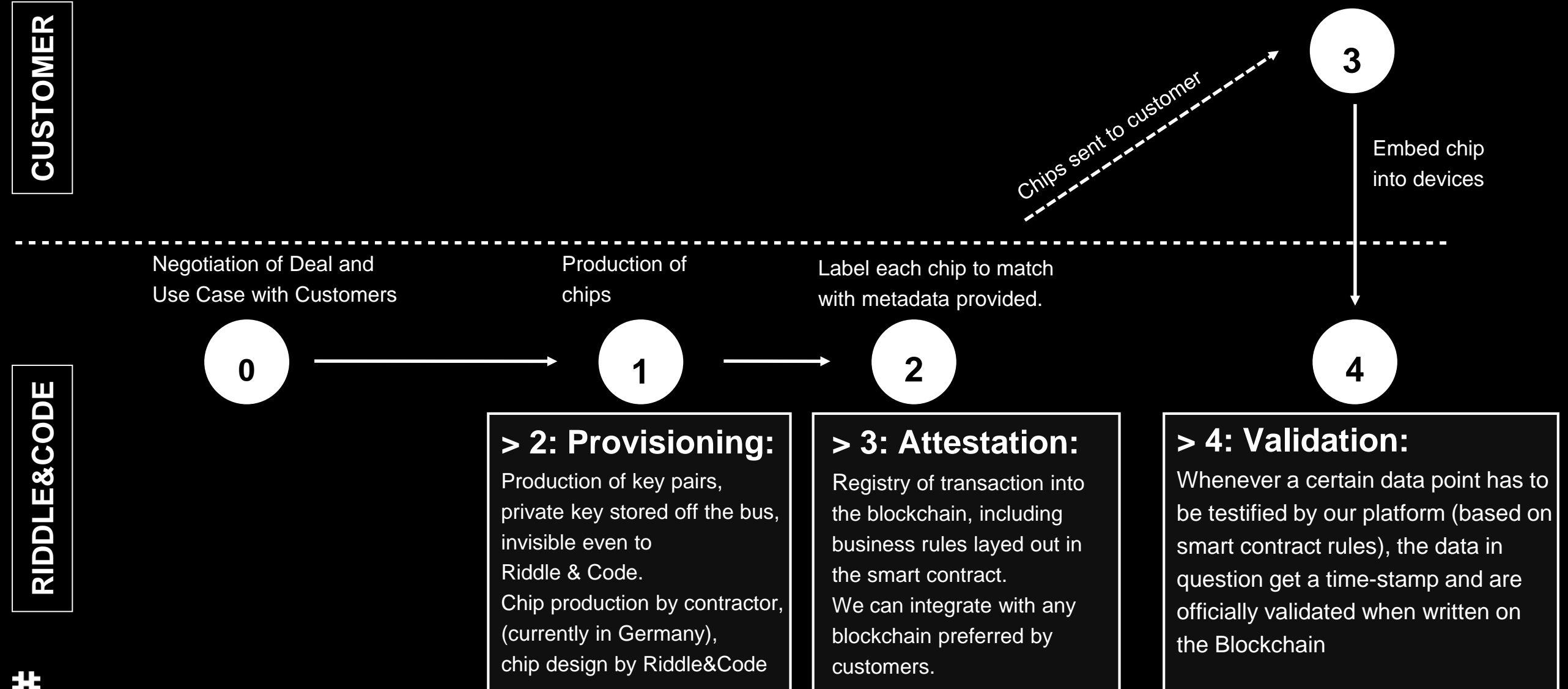
# HOW WE DO IT.

WORKFLOW - CUSTOMER JOURNEY

#

# THE VALUE OF THE PROCESS

HOW RIDDLE & CODE SECURES, VALIDATES AND TESTIFIES DATA, OFFERING TRUSTED CERTIFICATION.



*Riddle & Code*<sup>®</sup>

**THE NEW IS  
UNAVOIDABLE.**

**SEBASTIAN@RIDDLEANDCODE.COM**

**#**

