Blockchain for education
IT'S NOT ABOUT TECHNOLOGY!
IT'S ABOUT A NEW CUSTOMER RELATIONSHIP!
Figure out where the business will be most disrupted, and send the digital troops there. Don’t spread them everywhere -- go where the fight is.”
MATURES
Born: 1927-45
Age: 70+

BABY BOOMERS
Born: 1946-64
Age: 51-69

GEN X
Born: 1965-80
Age: 35-50

MILLENNIALS
Born: 1981-2000
Age: 15-34
Why Blockchain?

- Building trust
- Elimination of fraud
- 100% transparency

Other advantages:
- Simplified administration
- User-friendly
First applications

- Credential management (case “Informatie Vlaanderen”)
- Trusted MOOC’s / The A1 internet / The wikipedia problem
- Pedagogical approach: reward / punishment system
- Student tracking / Identity management
- Financial management
- Grant management
Credential/Competency management

- Credential/Competence is claimed by person
  - Credentials are confirmed by
    - Self
    - Educational institution
    - Teachers / Educational managers
    - Government
    - Third party auditors
  - Credentials can be checked by everyone
- Continued professional development
Student tracking

- 1 government system used by all schools
  - Identity management tracks all students
  - No double enrollment, tracking financial records, ...
  - Better statistics:
    - Drop-out monitoring
    - Out-of-school children

- Why blockchain:
  - all sided confirm students path
  - Data availability for everyone involved (parents, school, ...)

VIA Don Bosco
Trusted Moocs

- The Wikipedia problem
- The A1 internet
  - Peer reviewed content, with audit-trail
  - Credentials of author confirmed by research institute, educational institution, government, peers, ...
- Based on ‘proof of authority’
Financial management

- VIA Don Bosco use case
  - No more fraud
  - 100% transparant for
    - Donors
    - Educational institutions
    - Students
    - Government & auditors
  - Transparancy empowers student bodies
Grant management

- Application is approved
- Payment is made regularly based on ‘proof of work’
  - By the student (online assessment)
  - By the educational institution (invoice, proof of attendance)
- Result is published in credential management
Pedagogical management

- Digital ‘reward & punishment’ system
  - Aimed at developing ‘soft skills’
  - Good/bad behaviour leads to a point system
  - Awarded points are confirmed by educational team / peers / ...
  - Points can be traded in for real world gifts related to behaviour
    - (use case: public transportation in NL)
    - Eg: students that clean up trash on the schoolyard are rewarded with a reusable water bottle
Business model VIA Don Bosco

Directorate General for Development (DGD)
- Donors

Financial auditor DGD

Company Auditor / Commissioner

VIA Don Bosco

Planning & Development office (PDO)

Employment office

Vocational Training Centers (VTC)

Suppliers

Program managers

Financial team
Blockchain technology explained

- Advanced cyber security
- Based on Distributed Ledger Technology (DLT)

- First use-case: Bitcoin
  - Invented for reducing money transfer costs
  - Only 1 (bad) application
  - Heavy use for electricity = only for this type of blockchain
Topologie du réseau

Distributed

Centralized

Decentralized
Advantages of distributed technology

- Everybody owns the data
- Everybody sees the same data & in near real-time
- No single user/point can change the data
  - Hacking-proof
Technology ‘append-only’
Smart contracts - Conventions intelligent

1. An option contract between parties is written as code into the blockchain. The individuals involved are anonymous, but the contact is the public ledger.

2. A triggering event like an expiration date and strike price is hit and the contract executes itself according to the coded terms.

3. Regulators can use the blockchain to understand the activity in the market while maintaining the privacy of individual actors' positions.
Advantages of smart contracts

- Less administration
  - Formal checks are done by the system
- No discussion about rules
- Clear role management
Blockchain demo: anders.com
Public vs private vs GDPR
Blockchain moet administratieve overlast ngo's aanpakken

Minister De Croo op bezoek bij een onderwijsproject van Via Don Bosco in Bamako ( Mali), juni 2018
<table>
<thead>
<tr>
<th>Username</th>
<th>Role</th>
<th>Administrator</th>
<th>State</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ann</td>
<td>CPF</td>
<td>Yes</td>
<td>● Active</td>
<td>Edit</td>
</tr>
<tr>
<td>Bob</td>
<td>VDB</td>
<td>No</td>
<td>● Active</td>
<td>Edit</td>
</tr>
<tr>
<td>Catherine</td>
<td>VDB</td>
<td>No</td>
<td>● Disabled</td>
<td>Edit</td>
</tr>
<tr>
<td>Dylan</td>
<td>VDB</td>
<td>Yes</td>
<td>● Active</td>
<td>Edit</td>
</tr>
<tr>
<td>Elon</td>
<td>OB</td>
<td>Yes</td>
<td>● Waiting activation</td>
<td>Edit</td>
</tr>
<tr>
<td>Fleur</td>
<td>DGD</td>
<td>No</td>
<td>● Disabled</td>
<td>Edit</td>
</tr>
<tr>
<td>Gertjan</td>
<td>DGD</td>
<td>Yes</td>
<td>● Disabled</td>
<td>Edit</td>
</tr>
<tr>
<td>Hannah</td>
<td>OB</td>
<td>No</td>
<td>● Waiting activation</td>
<td>Edit</td>
</tr>
<tr>
<td>Invoice</td>
<td>CPF</td>
<td>Date</td>
<td>State</td>
<td>Actions</td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>-----------------</td>
<td>---------------</td>
<td>---------</td>
</tr>
<tr>
<td>Invoice 1</td>
<td>Benin</td>
<td>24/10/2018</td>
<td>Approved</td>
<td>Modify</td>
</tr>
<tr>
<td>Invoice 2</td>
<td>Benin</td>
<td>24/10/2018</td>
<td>Approved</td>
<td>Modify</td>
</tr>
<tr>
<td>Invoice 3</td>
<td>Benin</td>
<td>24/10/2018</td>
<td>Rejected</td>
<td>Reopen</td>
</tr>
<tr>
<td>Invoice 4</td>
<td>Benin</td>
<td>24/10/2018</td>
<td>Approved</td>
<td>Modify</td>
</tr>
<tr>
<td>Invoice 5</td>
<td>Benin</td>
<td>24/10/2018</td>
<td>Commented</td>
<td>Modify</td>
</tr>
<tr>
<td>Invoice 6</td>
<td>Benin</td>
<td>24/10/2018</td>
<td>Rejected</td>
<td>Reopen</td>
</tr>
<tr>
<td>Invoice 7</td>
<td>Benin</td>
<td>24/10/2018</td>
<td>Rejected</td>
<td>Reopen</td>
</tr>
<tr>
<td>Invoice 8</td>
<td>Benin</td>
<td>24/10/2018</td>
<td>Approved</td>
<td>Modify</td>
</tr>
</tbody>
</table>

200 invoices found
Modify Invoice 1

Category: Dummy Category

Modify category

John doe
20/10/2018 11:30

John doe
20/10/2018 11:30

John doe
20/10/2018 11:30

Accept
Override
Reject
Modify Invoice 1

Category: Dummy Category

Reject invoice

Reason of rejection

Reject

John doe
20/10/2018 11:30

John doe
20/10/2018 11:30

John doe
20/10/2018 11:30
## Monitoring

<table>
<thead>
<tr>
<th>Amount</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>OB expense</td>
<td></td>
</tr>
<tr>
<td>CFP expense</td>
<td></td>
</tr>
<tr>
<td>% rejected</td>
<td></td>
</tr>
<tr>
<td>% accepted</td>
<td></td>
</tr>
<tr>
<td>% exceptions</td>
<td></td>
</tr>
<tr>
<td>Budget reportage</td>
<td></td>
</tr>
</tbody>
</table>
Opportunities & Risks

- Changing donor & beneficiary relationship
- Financial management instead of monitoring
  - Error detection: where is capacity building needed?
  - Good practice detection: who is doing a good job?
- No double funding: 1 EUR = 1 token = 1 proof of expenditure
- Youth empowerment: what does the school spend money on?
Thank you!