VIA Don Bosco

Blockchain for education

IT'S NOT ABOUT
TECHNOLOGY!
IT'S ABOUT A
NEW CUSTOMER
RELATIONSHIP!

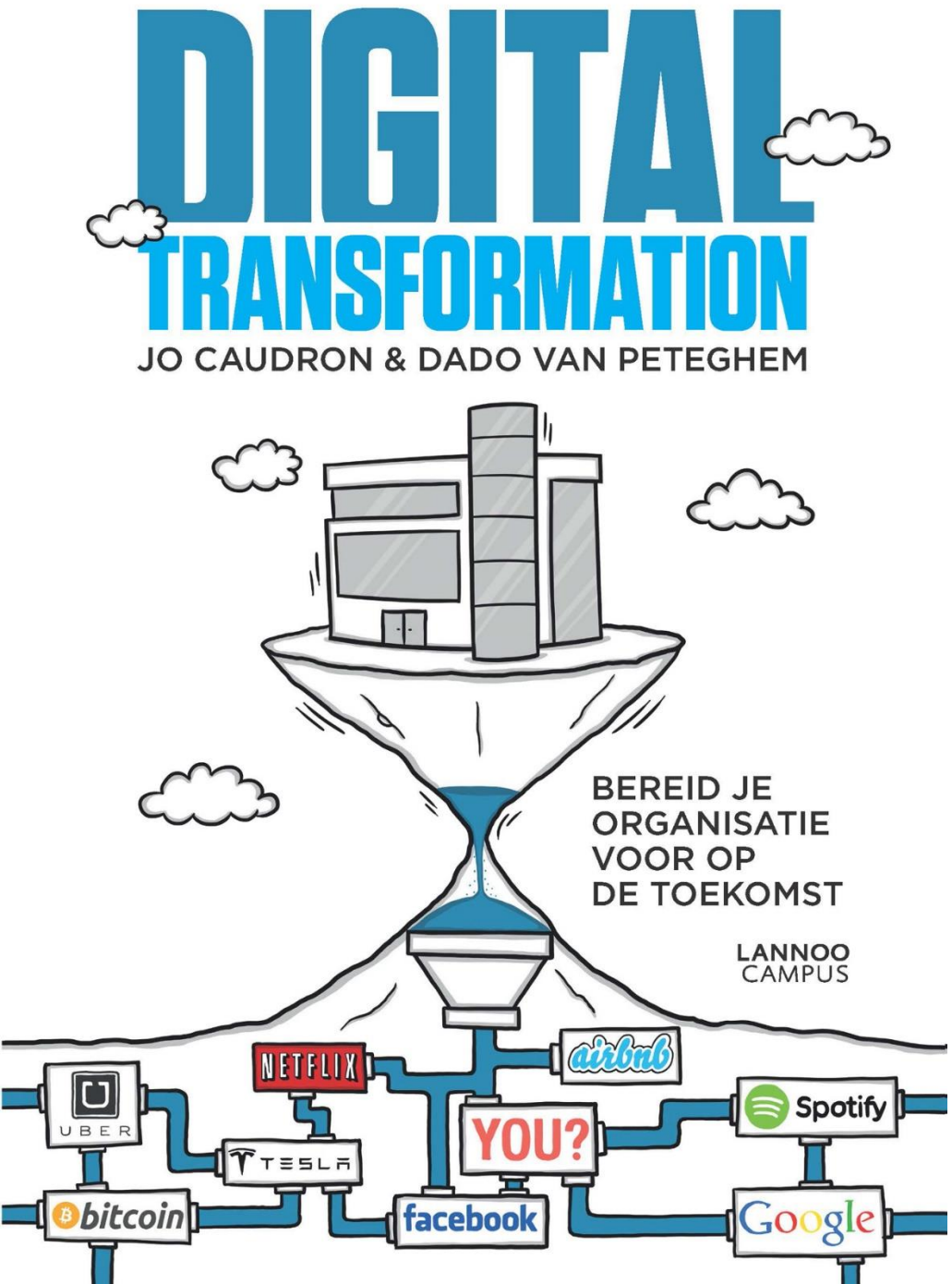


Figure out where the business will be most disrupted, and send the digital troops there. Don't spread them everywhere -- go where the fight is."

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

VIA Don Bosco

Why Blockchain?

- Building trust
- Elimination of fraud
- 100% transparancy

- Other advantages:
  - Simplified administration
  - User-friendly

VIA Don Bosco

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

VIA Don Bosco

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

VIA Don Bosco

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’

VIA Don Bosco

Financial management

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

VIA Don Bosco

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 attendence)
- Result is published in credential management

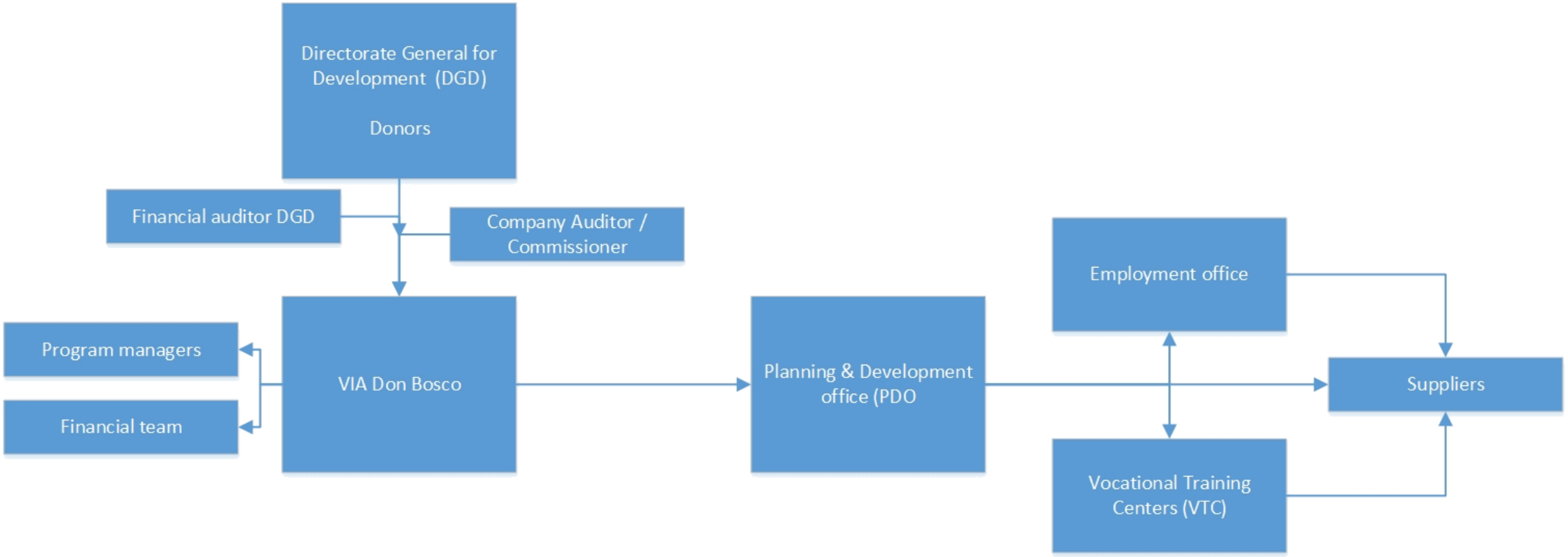
VIA Don Bosco

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

VIA Don Bosco

Business model VIA Don Bosco



VIA Don Bosco

Blochain technology explained

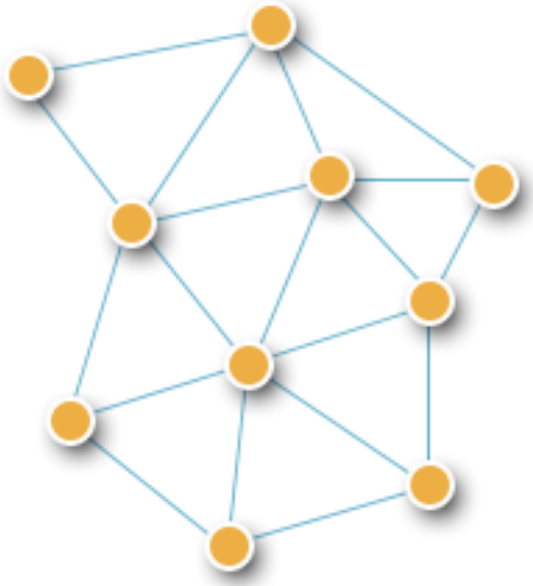
- Advanced cyber security
- Based on Distributed Ledger Technology (DLT)

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

VIA Don Bosco

Topology du réseau

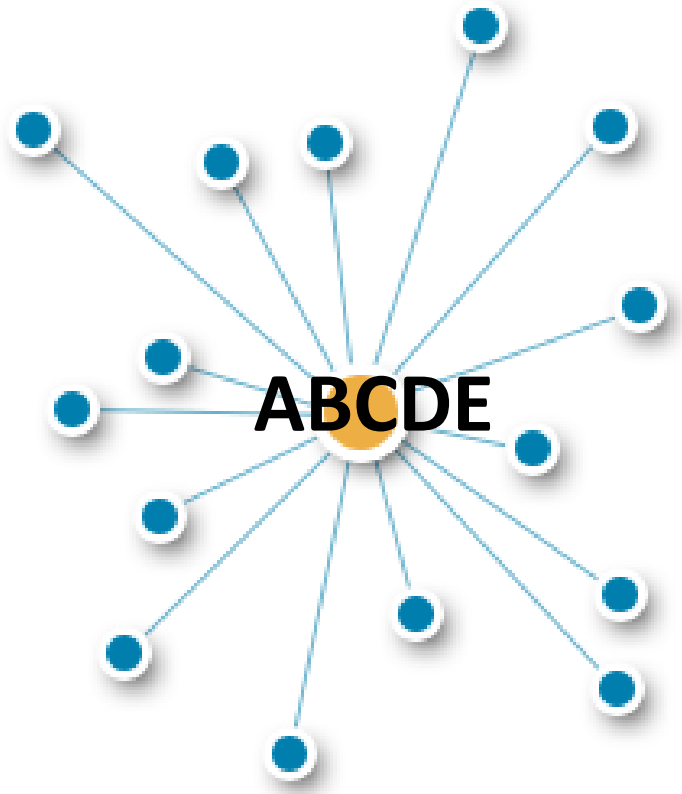
Distributed

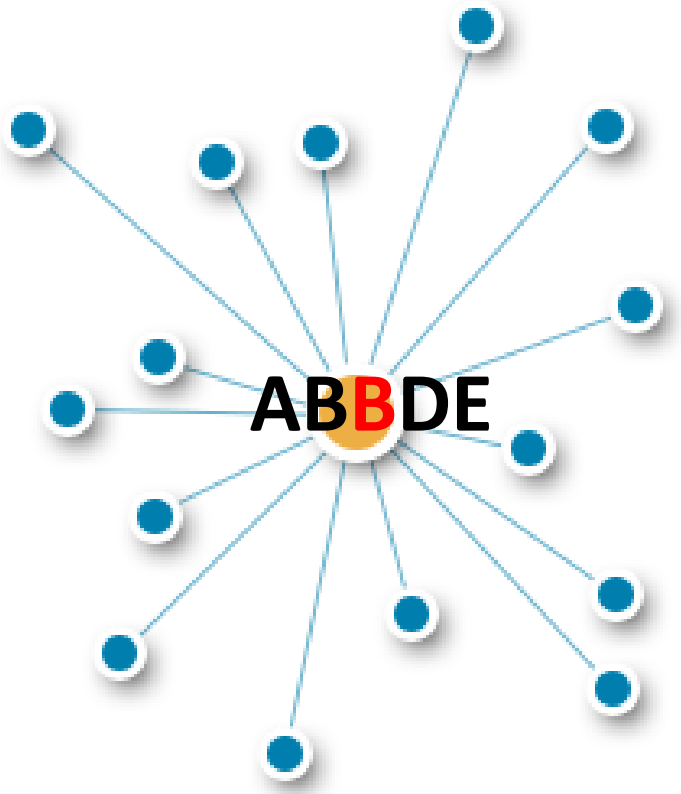


Centralized

Decentralized

VIA
Don Bosco





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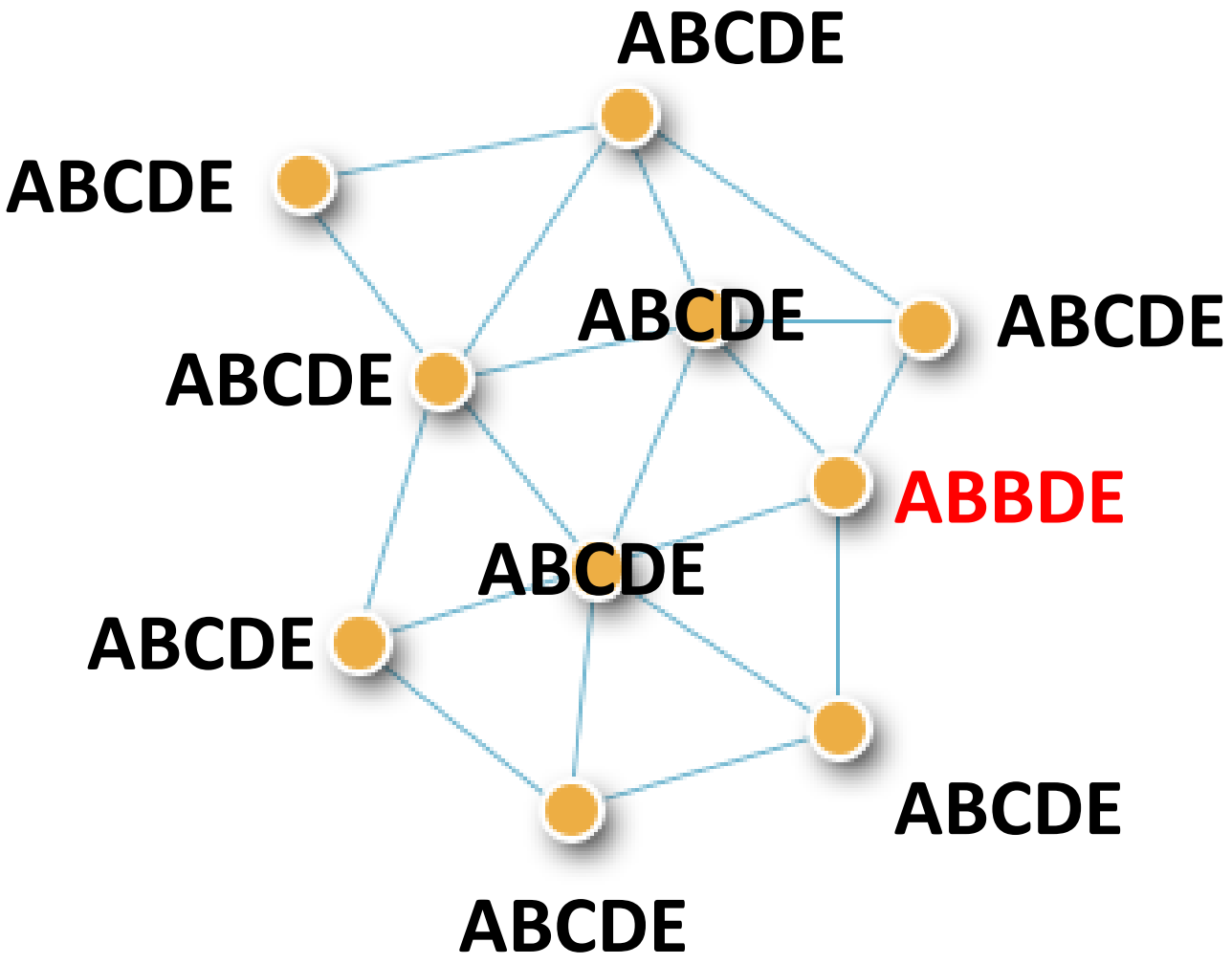
Don Bosco



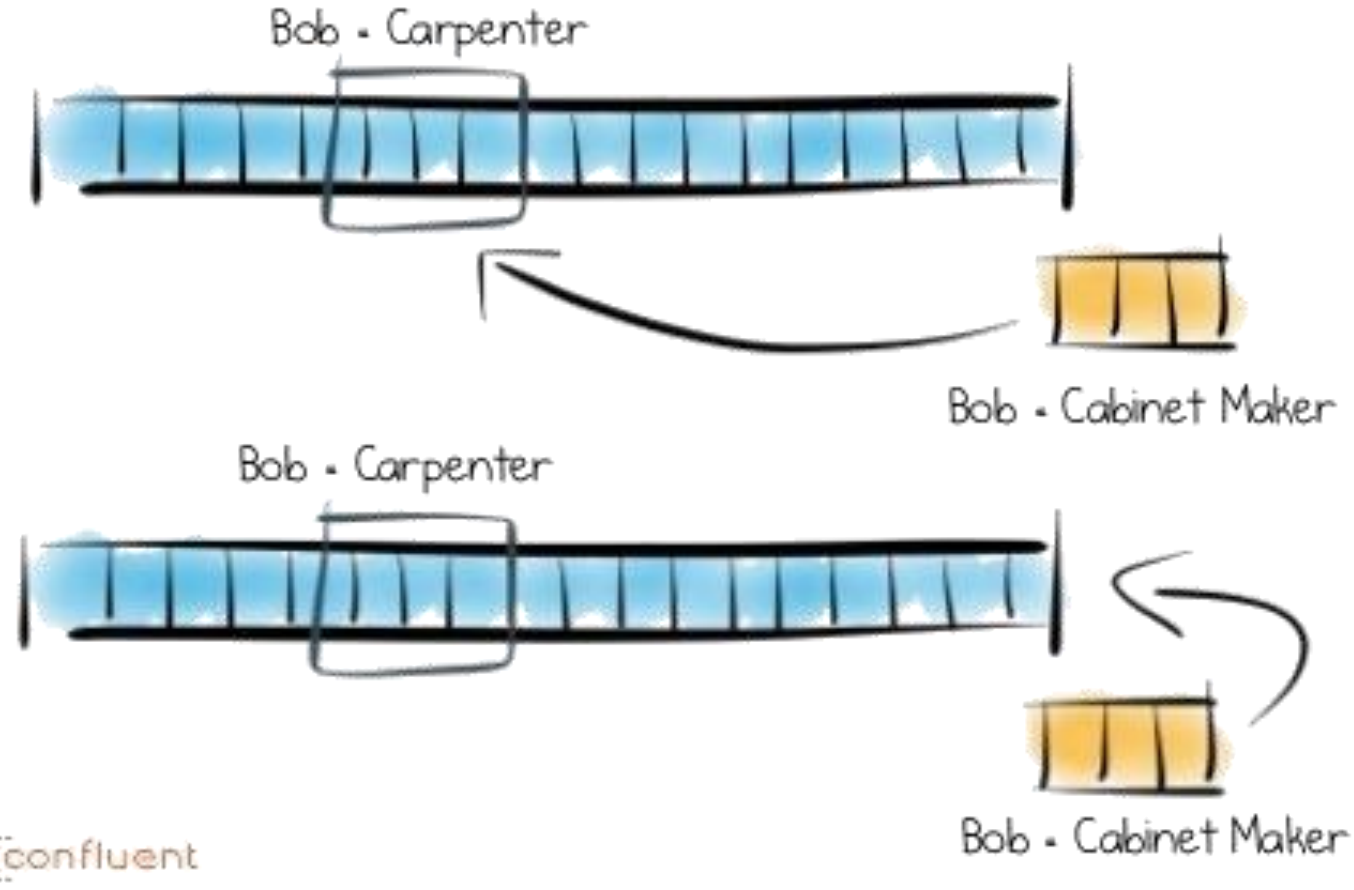
VIA Don Bosco

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

VIA
Don Bosco

Technology ‘append-only’



Update in Place
Ordered File
(Random IO)

Append Only
Journal
(Sequential IO)

confluent

VIA Don Bosco

Smart contracts - Conventions intelligent

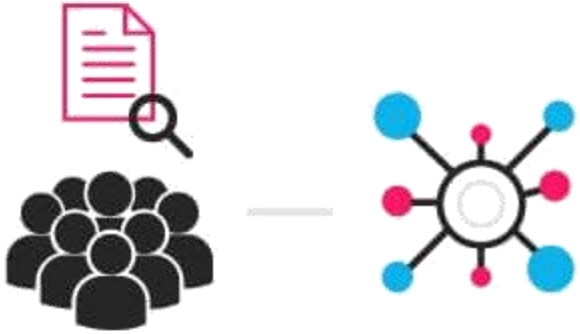
1

An option contact 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

VIA Don Bosco

Advantages of smart contracts

- Less administration
  - Formal checks are done by the system
- No discussion about rules
- Clear role management

VIA Don Bosco

Blockchain demo: anders.com

Block:	# 1
Nonce:	11316
Data:	
Prev:	0000000000000000000000000000000000000000000000000000000000000000
Hash:	000015783b764259d382017d91a36d206d0600e2cbb3567748f46a33fe9297cf

Mine

Block:	# 2
Nonce:	35230
Data:	
Prev:	000015783b764259d382017d91a36d206d0600e2cbb3567748f46a33fe9297cf
Hash:	000012fa9b916eb9078f8d98a7864e697ae83ed54f5146bd84452cdafd043c19

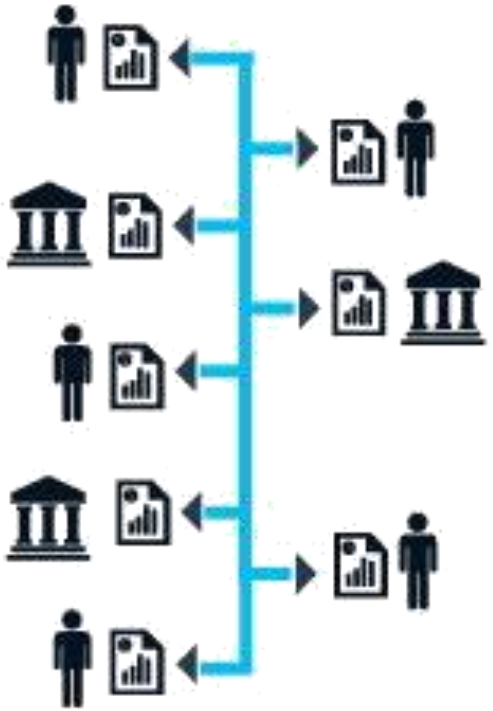
Mine

VIA Don Bosco

Public vs private vs GDPR

Centralised Ledger

Private Blockchain Ledger



Public Blockchain Ledger

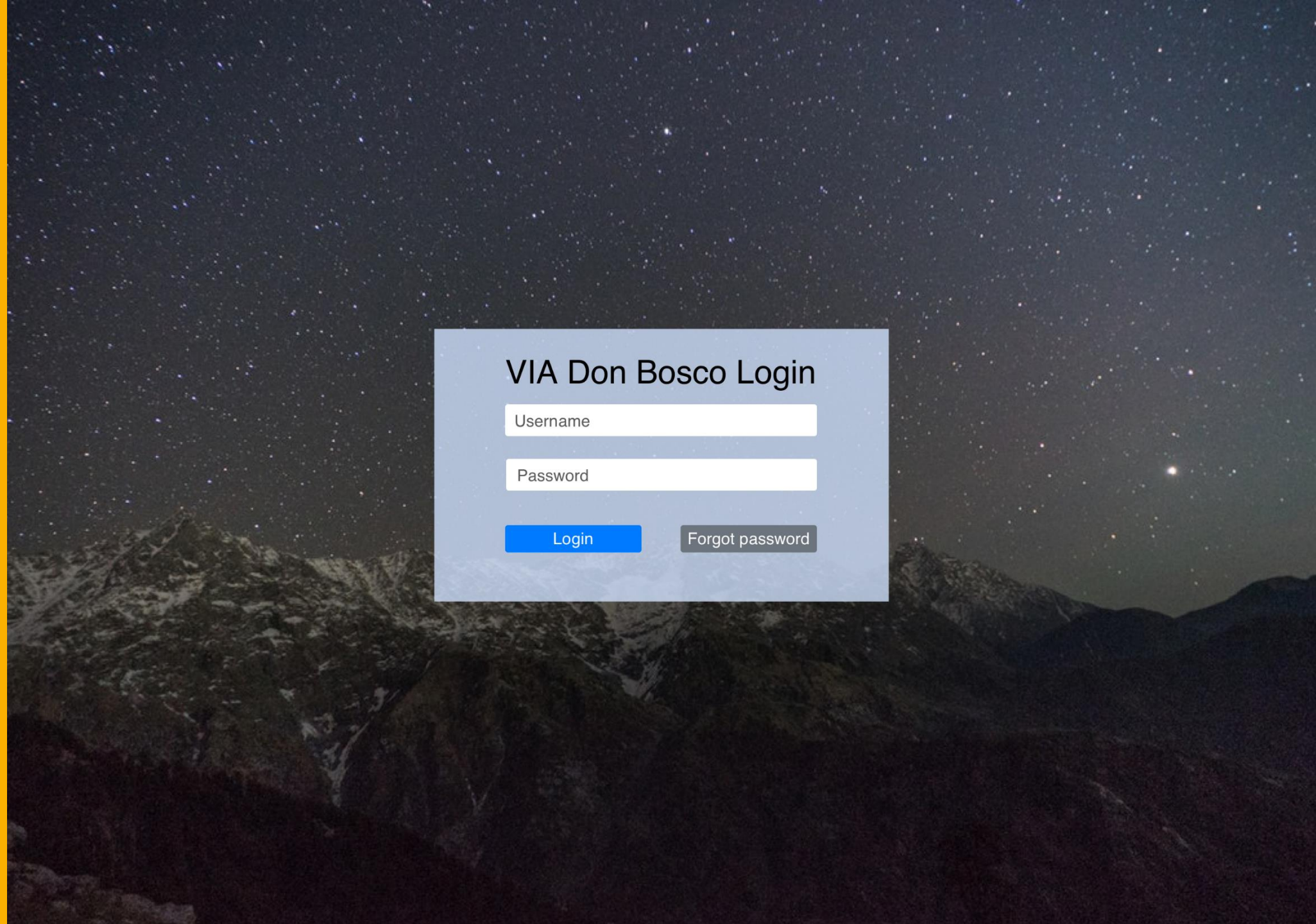
Via Don Bosco

Nieuws 22 maart 2018

Blockchain moet administratieve overlast ngo's aanpakken

Minister De Croo op bezoek bij een onderwijsproject van Via Don Bosco in Bamako (Mali), juni 2016

VIA Don Bosco



VIA Don Bosco

VIA Don Bosco

- Invoices
- Users
- Monitoring
- CFP Details

Jon doe
Administrator

Log out

Search user

Add user

Username	Role	Administator	State	Actions
Ann	CPF	Yes	Active	Edit
Bob	VDB	No	Active	Edit
Catherine	VDB	No	Disabled	Edit
Dylan	VDB	Yes	Active	Edit
Elon	OB	Yes	Waiting activation	Edit
Fleur	DGD	No	Disabled	Edit
Gertjan	DGD	Yes	Disabled	Edit
Hannah	OB	No	Waiting activation	Edit

<< < 1 **2** 3 4 5 6 … 20 > >>

20 users found

Don Bosco

Don Bosco

- Invoices
- Users
- Monitoring
- CFP Details

Jon doe
Administrator

Log out

Search invoice

Approved Commented Rejected

Invoice	CPF	Date	State	Actions
Inovice 1	Benin	24/10/2018	Approved	Modify
Invoice 2	Benin	24/10/2018	Approved	Modify
Invoice 3	Benin	24/10/2018	Rejected	Reopen
Invoice 4	Benin	24/10/2018	Approved	Modify
Invoice 5	Benin	24/10/2018	Commented	Modify
Invoice 6	Benin	24/10/2018	Rejected	Reopen
Invoice 7	Benin	24/10/2018	Rejected	Reopen
Invoice 8	Benin	24/10/2018	Approved	Modify

<< < 1 **2** 3 4 5 6 ... 20 > >>

200 invoices found

Don Bosco

Don Bosco

- Invoices
- Users
- Monitoring
- CFP Details

Jon doe

Administrator

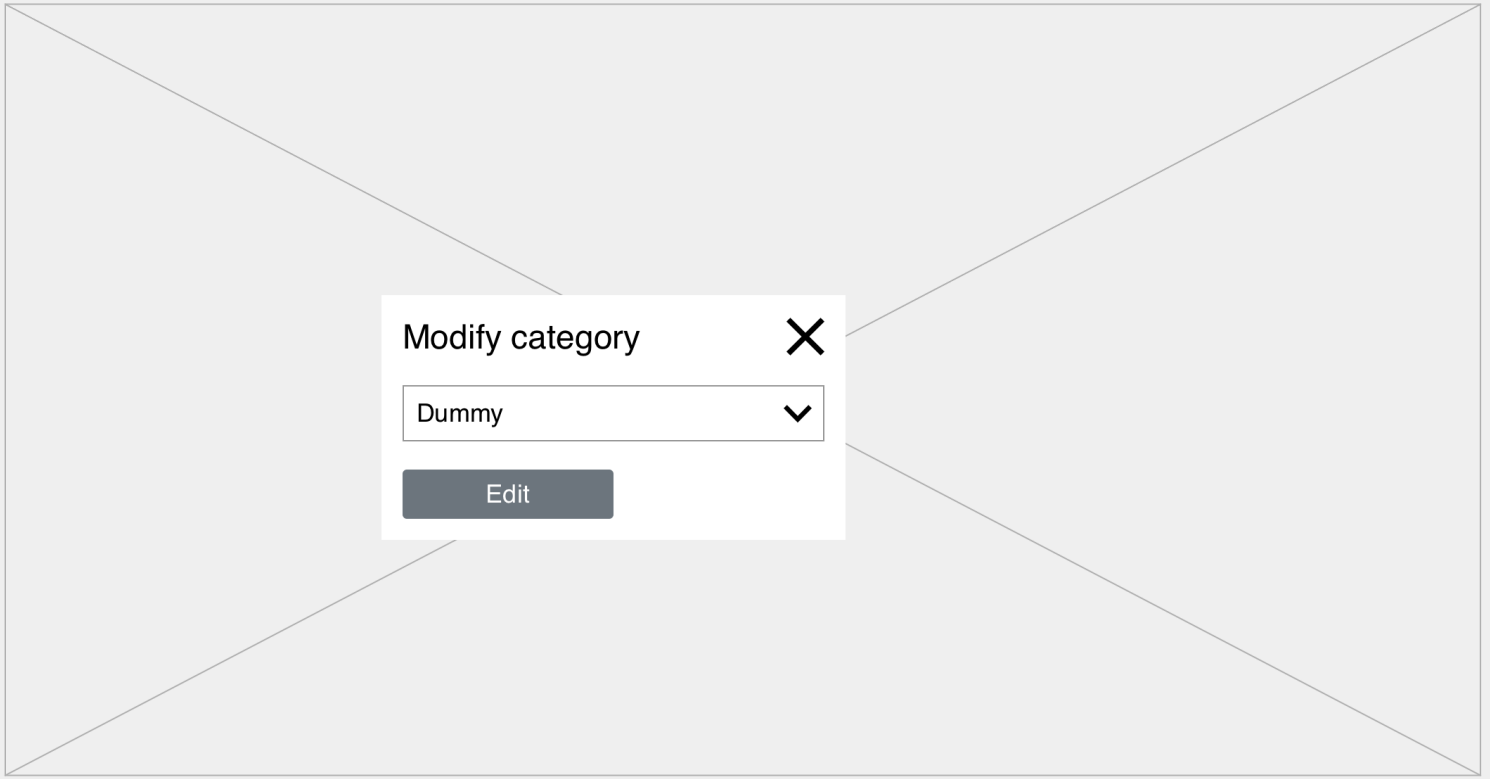
Log out

Modify Invoice 1

State: New

Category: Dummy Category

Accept | Override | Reject



John doe
20/10/2018 11:30

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Don Bosco

Don Bosco

- Invoices
- Users
- Monitoring
- CFP Details

Jon doe

Administrator

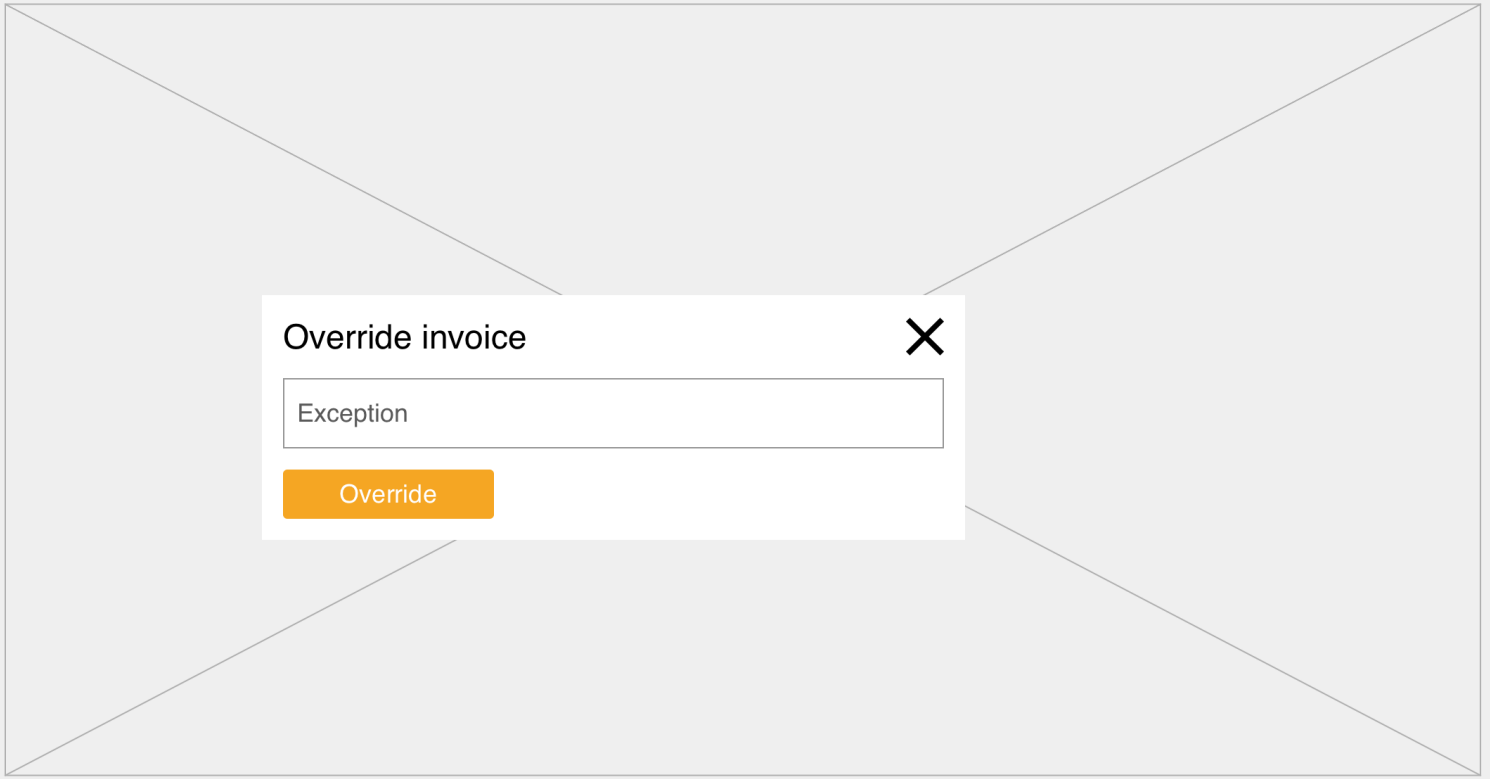
Log out

Modify Invoice 1

State: New

Category: Dummy Category

Accept | Override | Reject



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Don Bosco

Don Bosco

- Invoices
- Users
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- CFP Details

Jon doe

Administrator

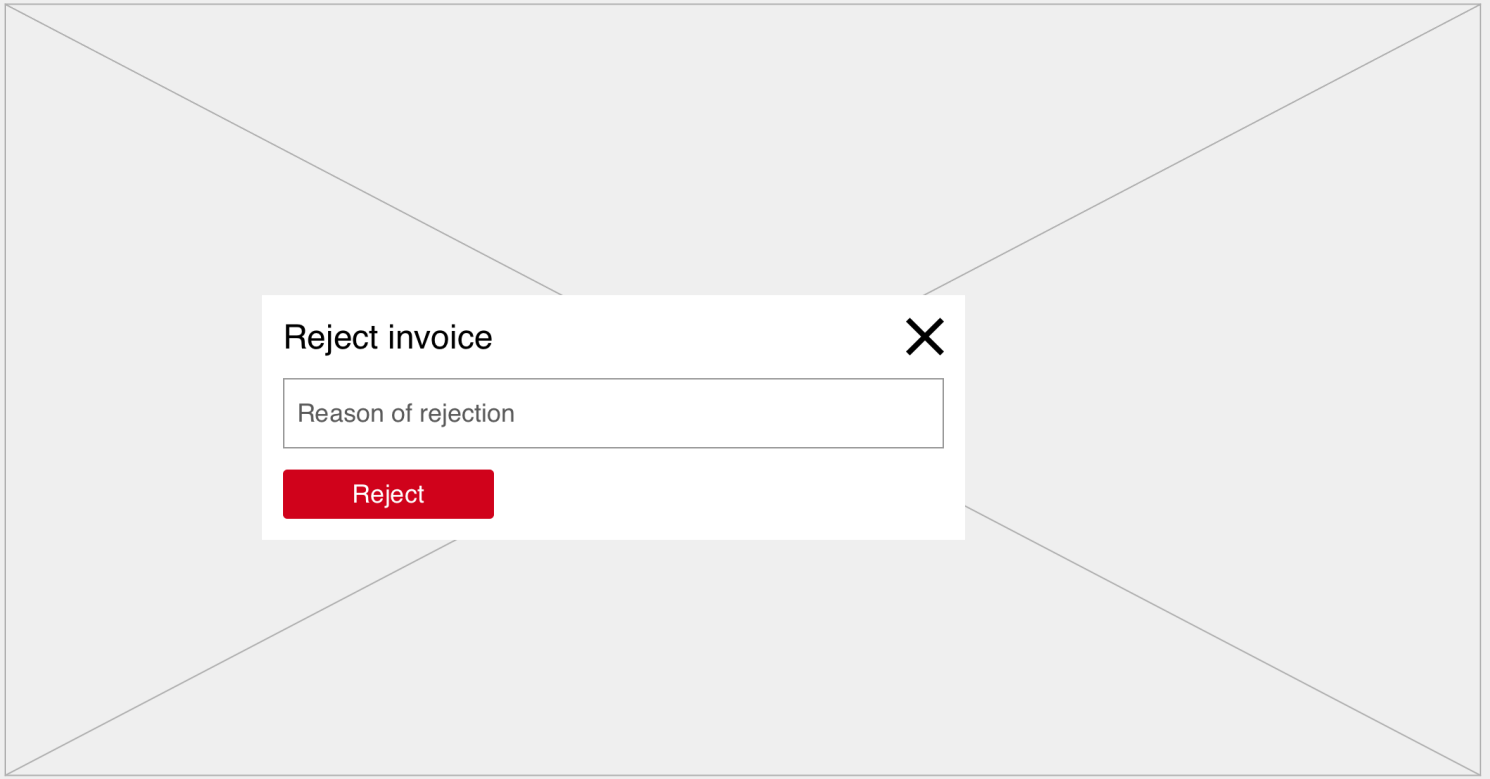
Log out

Modify Invoice 1

State: New

Category: Dummy Category

Accept | Override | Reject



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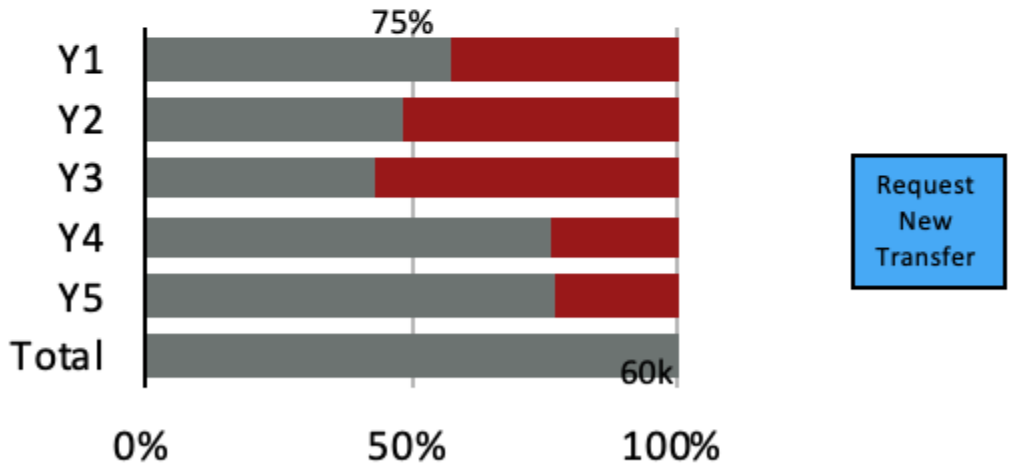
VIA
Don Bosco

View CFP

Name
User
Data
Data



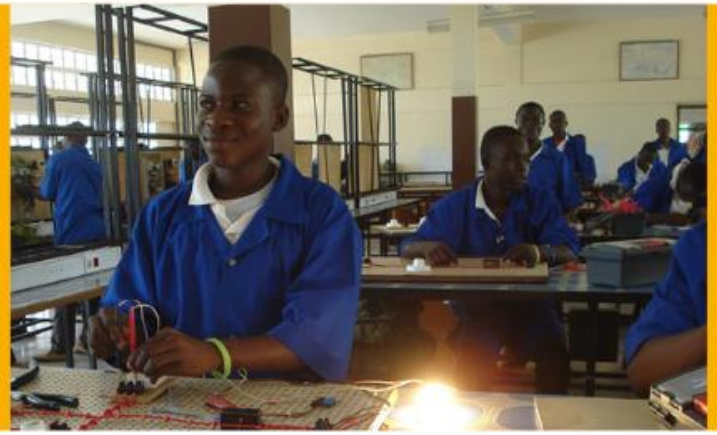
Monitoring

	Amount	Category
OB expense		
CFP expense		
% rejected		
%accepted		
% exceptions		
Budget reportage		

VIA Don Bosco

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?

VIA Don Bosco

Thank you!