Digital twins are virtual worlds that give you the illusion of real life and solve the big challenge of coping with the exponentially growing complexity that is inherent in any real project.

Digital twins are enablers that merge Virtual Reality with Industries 4.0 and add a layer for visual design.

Digital twins allow architects to demonstrate the result of a design before money is spent on real resources.

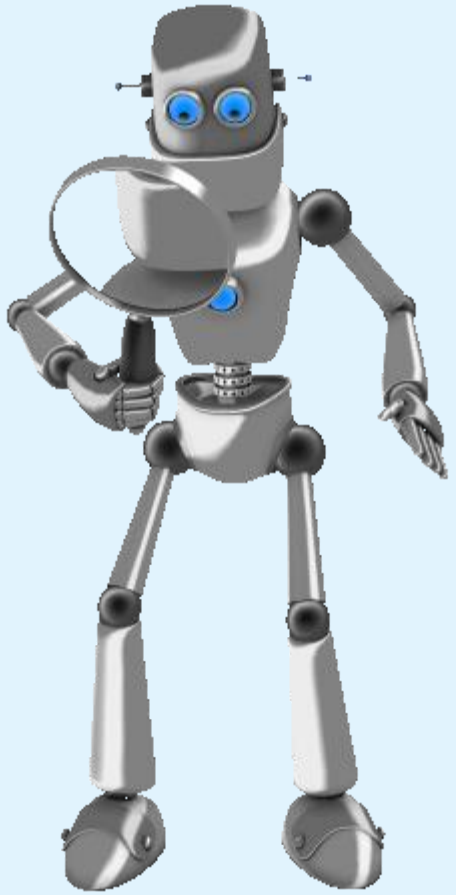
Get a grip on their potential and hear how they work.

Building the digital twin airport

Axel Angeli

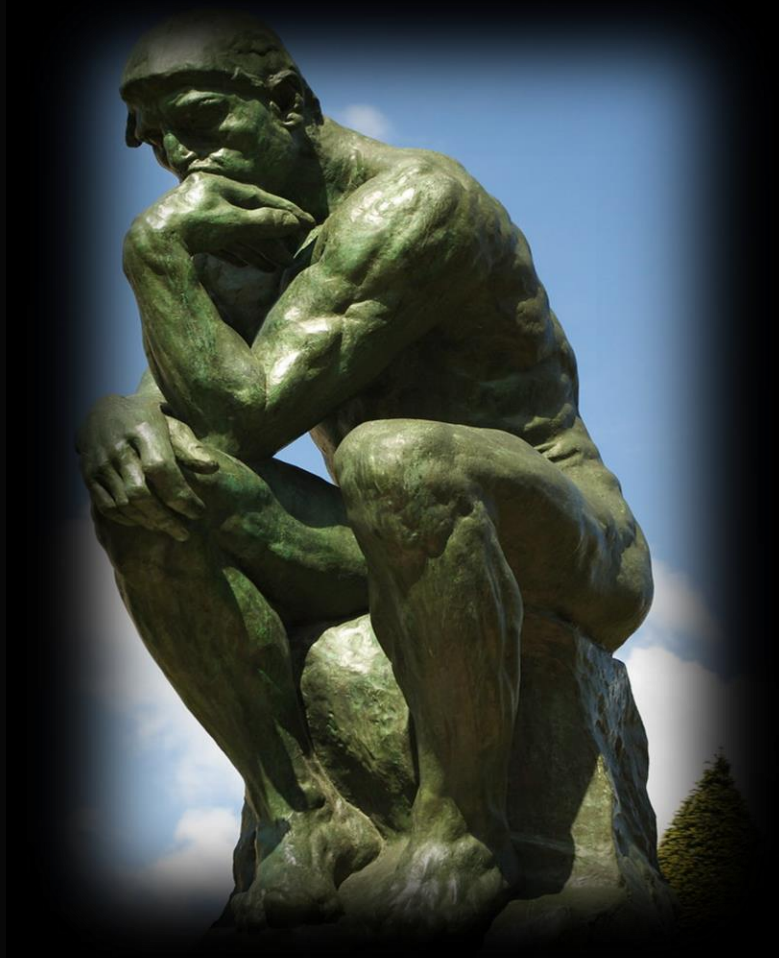
Cybernetician – A Digital Future Evangelist
Logosworld 50 Experts, Germany / Luxemburg

- How Industry 4.0 works for airports
- The trend of digital twins
- How AI, IoT and serious gaming work hand in hand



Two Twin Statues

One in the real world



One designed in the virtual space

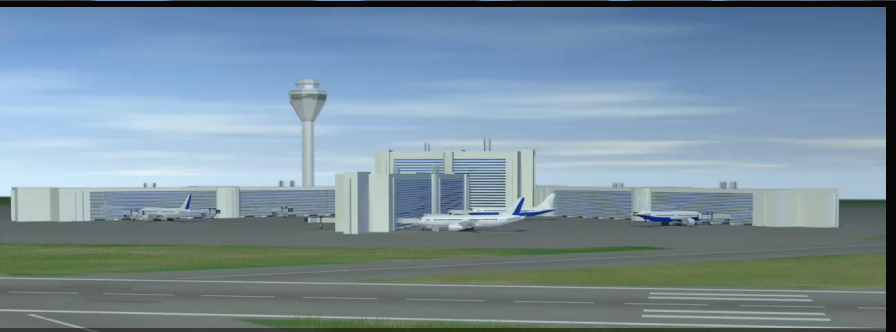
Digital Twins are replicas of real world objects in a virtual environment

Digital Twins expand the benefits of Industries 4.0 with a visual experience.

→ Visual Industries 4.0

With Digital Twins we can build virtual prototypes for experiments without destroying real resources.

Flight Simulator: an early Digital Twin



Digital Twins have been a companion during the evolution of modern computer sciences. A well known representative is and was the Microsoft flight simulator.

Nowadays the markets are full with simulation games for everything: farming simulator, train simulator, formula 1 simulator, simulation simulators, etc.

SIMCITY and the ANNO games are also early digital twins. Industries adopt those simulation for complex and dangerous activities without risking real resources.

Flight Simulator, Sim-City, Farming, Train, Cruise Ship Simulator, etc. are ideal companions for training

Source: https://www.youtube.com/watch?v=7TaR1WhloYY (Commercial)

Digital Twins in Architecture

A Digital Twin scan with exact measurements from Notre Dame de Paris is a wonderful model how Twins can be used in architecture, e.g. for:

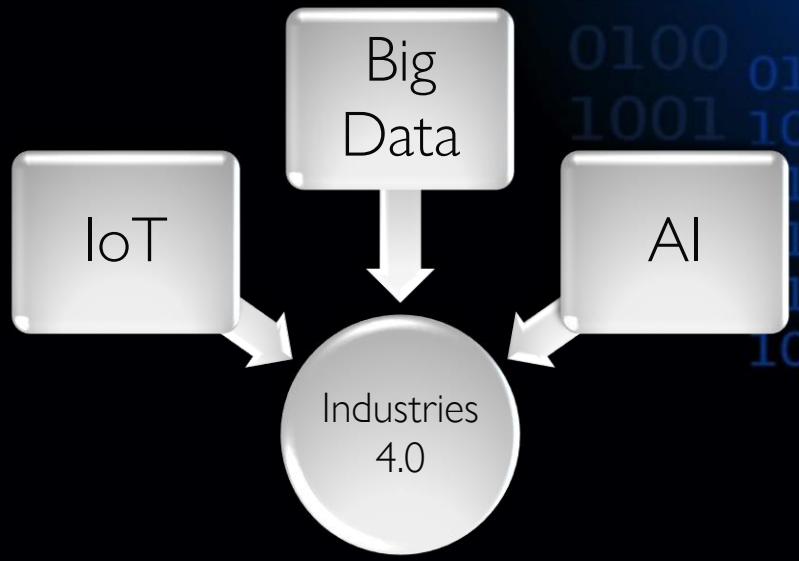
- Reconstruction
- Remodelling
- Replication
- Fitting templates to real world

Late Professor Andrew Tallon (†2018) created a point cloud with detail measurements of the geography of Notre Dame de Paris. This data helps in reconstruction of the cathedral after the devastating fire in 2019.

Industries 4.0 is a design concept developed in 2010 with sponsorship of German government. It shows a strategic way to create automation based on IoT, Big Data Oceans, and ÁI based machine learning techniques.

Digital Twins = Visual Industries 4.0

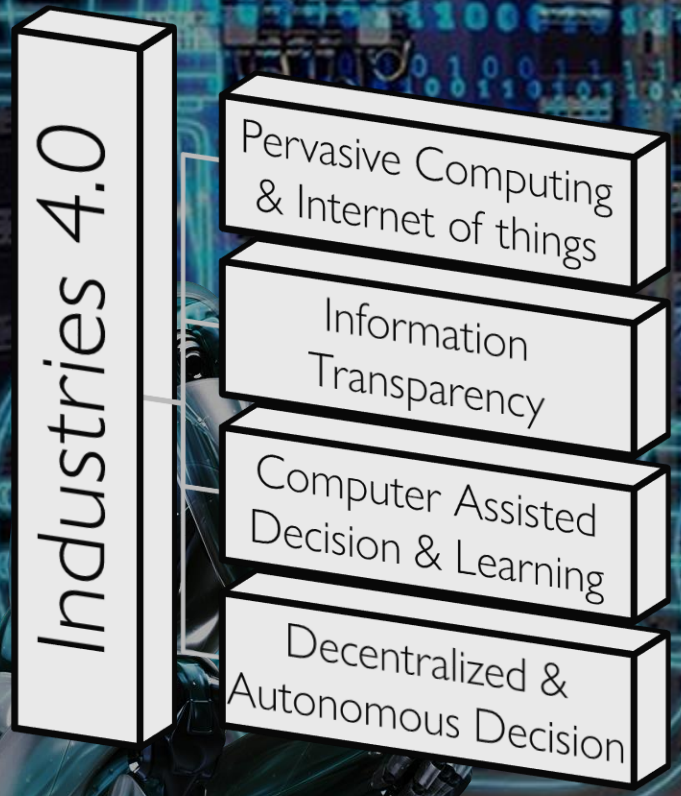
Industries 4.0 is a colloquial expression for using Artificial Intelligence machine algorithms to process Big Data that is collected by IoT



Digital Twins make the Industries 4.0 processes visible for humans

Industry 4.0 Paradigm

Health Care – Agriculture – Mobility – Logistics – Smart Cities – Architecture – Manufacturing – Smart Energy – Sustainability – Wild Life – Media – Publishing –Smart Science – Education



Machine-assisted, autonomous, pervasive computing

Pervasive Machine Network ("IoT")

- Every sensor and actor should be accessible from anywhere in the internet in real-time when needed

Transparency of Information

- A complete computerized model of all industrial work processes where decisions are reproducible

Computer Assisted Decision Making & Learning

- Recurring decisions are made by algorithms whenever possible and help learning patterns and persist them

Decentralized and Autonomous Decision Making

- Decisions are made at the point and means of highest competence

Benefits of Digital Twin

- The Electronic Eye
- Visual design in R&D
- Non–destructive virtual reality testing, practice and training
- Communicating System
- Pseudo Data Generators

The Electronic Eye

- Optimize workflows by combining AI and human cognition
- Let machine learning AI analyse the data in parallel to „seeing“

Visual design in R&D

- Builds easier consensus through common imagination
- Simulate mal-function and verify Standard Operation Procedures

Non–destructive virtual reality testing, practice and training

- Train and practice operations and procedures
- Simulate extreme situation like crashes and effects of interventions

Communicating System

- Real world objects can communicate in real time via the internet
- Internet data lakes allow comparison with similar results

Simulations and Data Generators

- Simulate interaction processes
- Simulations can generate practice data without real sensors

Digital Twins are far more than simple simulation. They make a replica in a gamified world and lets you play

Simulation vs. Digital Twins

Digital twins are more than simulations

- Visualize real world with “many eyes and senses”
- Measure other medias’ signals
- Correlate multi-dimensional data in real-time
- Pattern recognition (“Machine learning”)
- Real-time comparison with internet data lakes

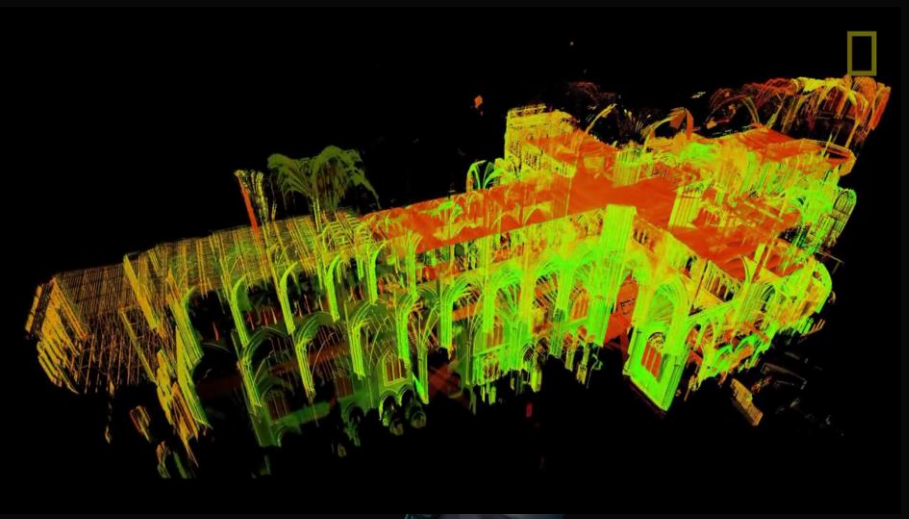
Digital Twins can generate data that allows a new dimension of data anlytics

Digital Twins as Data Generators

- Twin components can talk with each other
- The communication can generate new insights
  - Chess computers that play against each other generate new constellations and they improve by memorizing them
  - By doing so nowadays chess computers are widely invincible

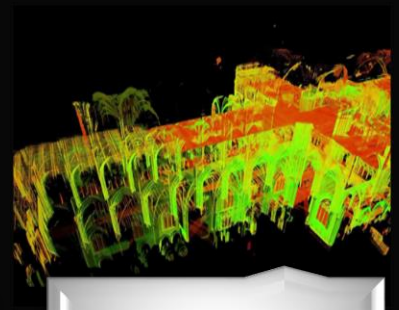
Digital Twins can simulate communication between twin components. Imagine it like a two chess computer that play with each other. By doing so they can generate new generic data from simulated experiences.

How to build a Digital Twin fast



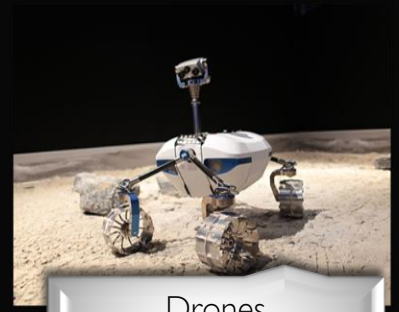
- Create a point cloud of the real world
  - get dimensions and multitude of sensor data
- Place sensor (cams, mikes, barometer etc.) where you expect fast change
  - Allowing a dynamic adoption of the twin
- Real-time sensors and robots
  - Remote controlled cams, drones, rovers do real-time update of the twin
- Add Industries 4.0 AI analysis

- The point cloud is a wire-frame image of the real object
- Replicas of real world are common practice in simulation game industry
- We use drones and rovers to reach places that are not humanb-accessible
- The challenge is to keep the data up-to-date, ideally in real-time
- To make best use of the twin we need to integrate it into an Industries 4.0 analytics framework



Point Cloud

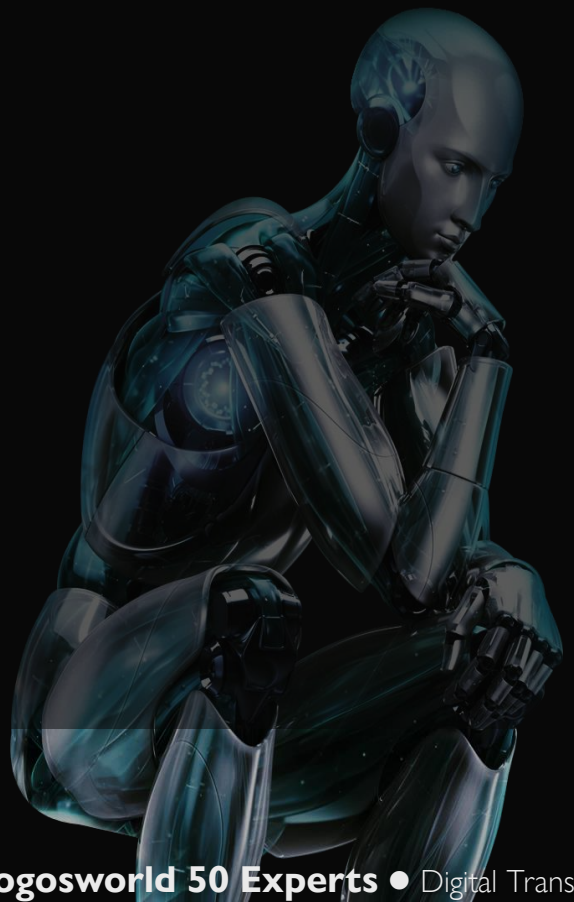
Sensors



Drones
Rovers

Artificial Intelligence

Digital Twins



Examples of Digital Twin Projects

SCADA and the digital twin:
What's the difference?

SCADA (the Supervisory Control and Data Acquisition) is a system of software and hardware elements that allows operators to control and maintain efficiency through images of the current status of a system. By contrast, the digital twin can depict the past, present and future of the system. It's a faster and more efficient way to gather information than observing the physical system.

Digital twins in airports: How a 3D visualisation can improve baggage handling operations (beumergroup.com)

Digital twins in airports: How a 3D visualisation can improve baggage handling operations (beumergroup.com)

https://www.artgp.fr/

- (709) Charpente de Notre-Dame - Art Graphique & Patrimoine - Voyage dans le nuage de points – YouTube
- (709) Penseur de Rodin - Modèle 3D – YouTube

(709) Vouse's Digital Twin of Changi Airport | Build: Architecture 2021 – YouTube

- Digital Twin: A Real-Time Interactive Airport Visualization Tool - ACI Insights

(709) (Dassault) ADOPTING VIRTUAL TWIN TECHNOLOGY TO OPTIMIZE AIRPORT OPERATIONS – YouTube

(709) Digital Twins of airport,Metaverse, made by UE5 – YouTube

Scan the World - The Thinker (Auguste Rodin) - The Thinker – Wikipedia

(710) Airport digital twin – YouTube

- Tunnelware

Digital Twin: A Real-Time Interactive Airport Visualization Tool - ACI Insights

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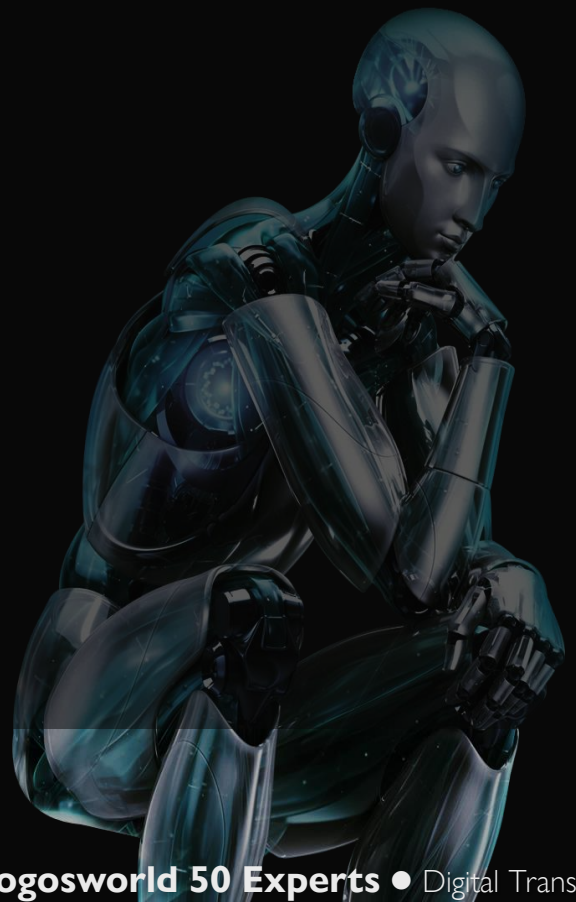
https://www.youtube.com/watch?v=7TaR1WhloYY

Components for a Digital Twin



Types of digital twins

Source of this definition: IBM.COM

Types of digital twins

There are various types of digital twins depending on the level of product magnification. The biggest difference between these twins is the area of application. It is common to have different types of digital twins co-exist within a system or process. Let's go through the types of digital twins to learn the differences and how they are applied.

Component twins/Parts twins

- Component twins are the basic unit of digital twin, the smallest example of a functioning component. Parts twins are roughly the same thing, but pertain to components of slightly less importance.

Asset twins

- When two or more components work together, they form what is known as an asset. Asset twins let you study the interaction of those components, creating a wealth of performance data that can be processed and then turned into actionable insights.

System or Unit twins

- The next level of magnification involves system or unit twins, which enable you to see how different assets come together to form an entire functioning system. System twins provide visibility regarding the interaction of assets, and may suggest performance enhancements.

Process twins

- Process twins, the macro level of magnification, reveal how systems work together to create an entire production facility. Are those systems all synchronized to operate at peak efficiency, or will delays in one system affect others? Process twins can help determine the precise timing schemes that ultimately influence overall effectiveness.

Types of digital twins

Source of this definition: IBM.COM

Types of digital twins

There are various types of digital twins depending on the level of product magnification. The biggest difference between these twins is the area of application. It is common to have different types of digital twins co-exist within a system or process. Let's go through the types of digital twins to learn the differences and how they are applied.

Twins for physical component

- Component twins are the basic unit of digital twin, the smallest example of a functioning component. Parts twins are roughly the same thing, but pertain to components of slightly less importance.

Twins for aggregates and units

- When two or more components work together, they are an aggregate. Analysing the interaction of those components can create a wealth of virtual data and turned into insights and actions.

Twins for System

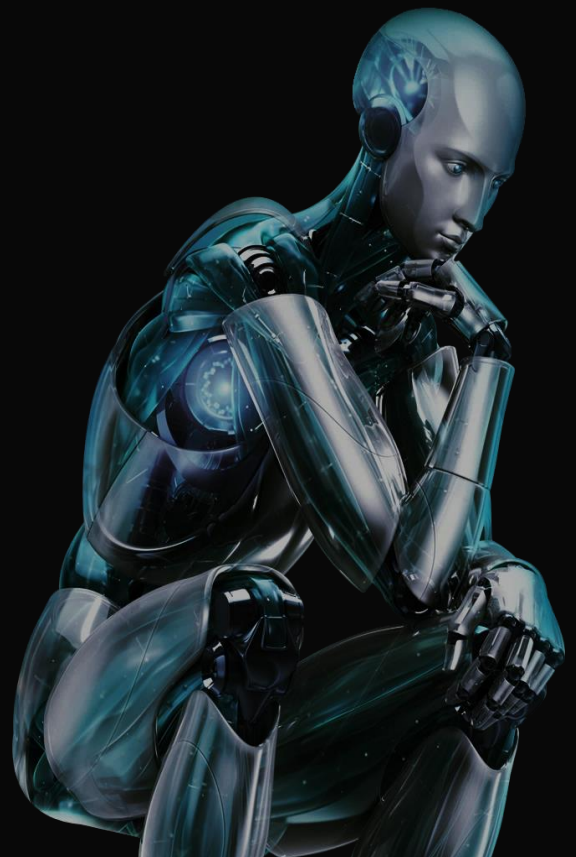
- Systems are complex aggregates with many loosely couples and interacting components. System twins allow analysis of complex behaviour by simulation and controlled manipulation to suggest performance enhancements.

Twins for Processes

- Process twins demonstrate by simulations how systems work together. You can measure side-effects and performance behaviour in highly complex interaction between non trusting units to determine overall effectiveness and stability.

Use Cases for Digital Twins

Where Twins are better than reality



In Training

- You can practice over and over again
- You can save resources, like fuel and money
- You won‘t need the original equipment
- You can practice extreme situation and fails

Digital Twins

- Initial applications in airports

The real-time interactive 3D experience enabled by DT provides an airport with the opportunity to reconfigure and reassess the entire operation with ready access to:

- Holistic airport view
- Stakeholder visualization
- As-built documents
- Infrastructure planning
- Asset management
- Visualizing ground operations
- Tracking system performance
- Simulating emergency scenarios
- Pre-test operational plans
- Simulator-based staff training

Connected Wearables

Agriculture 4.0

Artificial Intelligence for high-performance yields and sustainability in nature with zero waste

Applying the concept of Industries 4.0 into farming and environment

Other names:

- Smart Farming
- Precision Farming

Agriculture 4.0

Sports

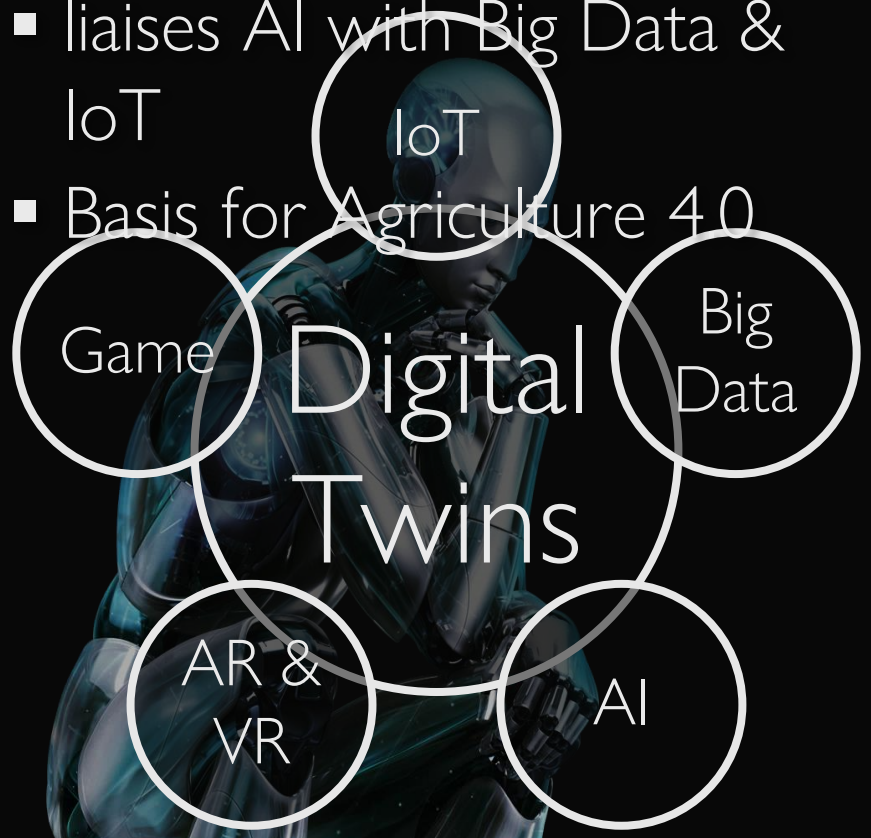
Aircraft Design

Promises of Digital Twins

The ingredients of Digital Twins

Industries 4.0

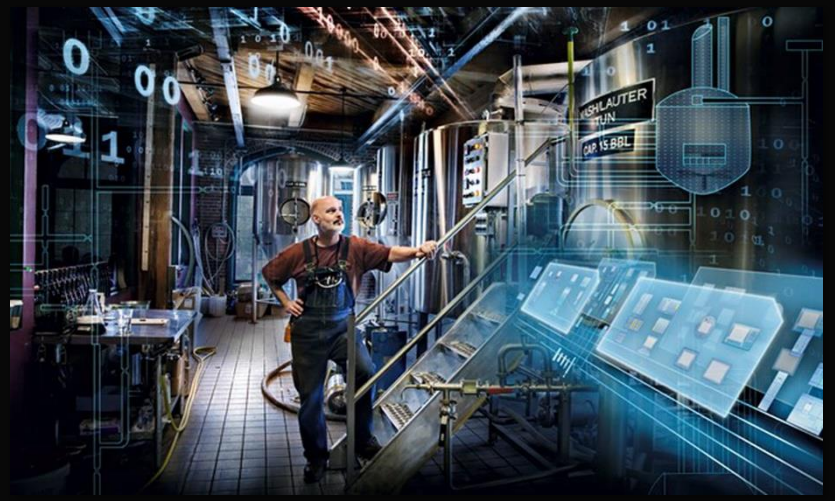
- is a design Design Concept that
- liaises AI with Big Data & IoT
- Basis for Agriculture 4.0



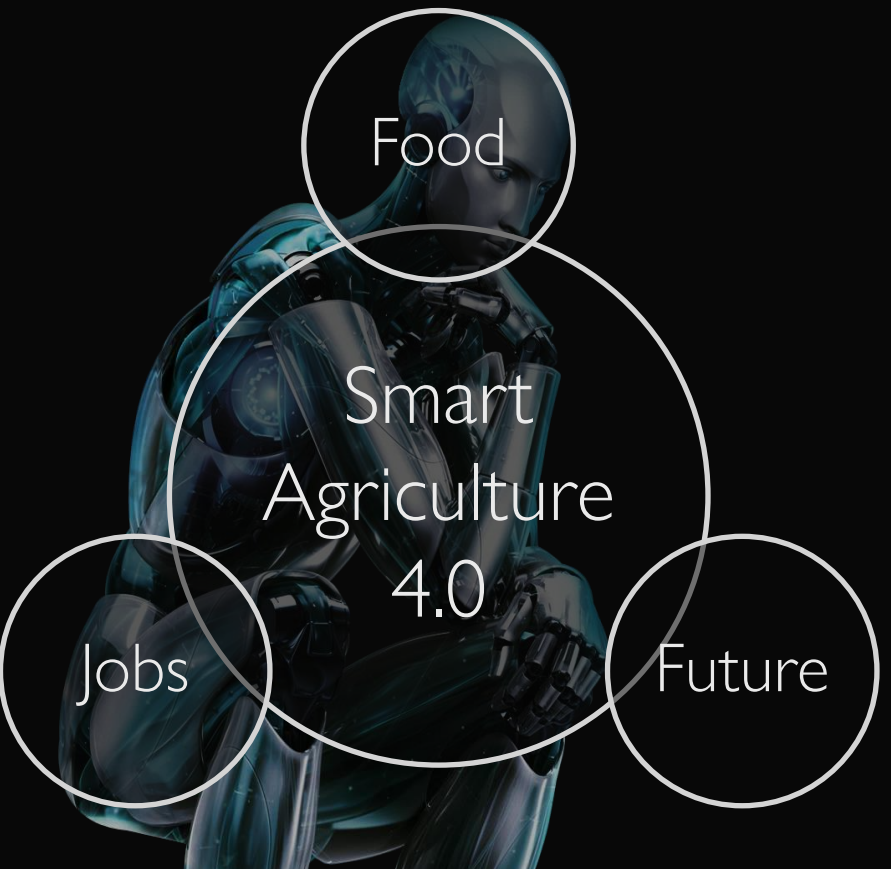
Digital Twins are the visualization of the design concepts of Industries 4.0

Digital Twins depend on

- Big Data
- collected by the
- Internet of Things
- made available in
- Real-time everywhere
- for processing by
- Artificial Intelligence
- Visually prepared by
- Augmented and Virtual Reality
- presented in a
- Gam,ified Environment



Promises of Smart Agriculture 4.0



Precision Farming

- Agriculture with nearly zero waste
  - No wasted pesticide or fertilizers
- Just in time harvest and farming
  - Produce exactly what the market needs

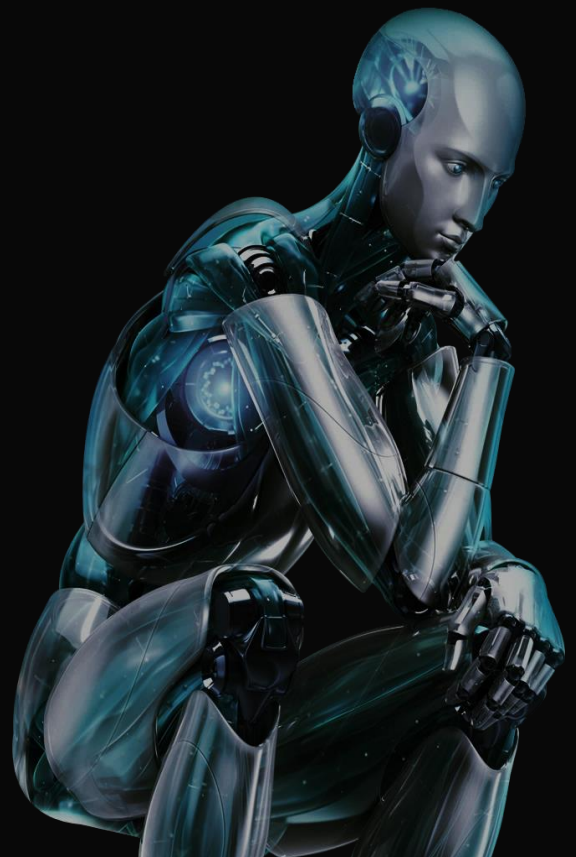
Education in agri technology for local needs

- Tech education for young people
- Invent solutions for local needs by locals
- Employment and alimentation for all

Agriculture 4.0: Industries 4.0 for nature

Industries 4.0

- Design Concept
- IoT + Big Data + AI



Components

Internet of Things
- for data acquisition

Big data
- for building large data lakes

World-wide networks
- for information exchange

Artificial Intelligence
- for analysis, prediction, decisions

Benefits

Virtual cooperation platform
- Limitless data exchange

Virtual simulation laboratories
- Simulate before implementation

Virtual market places
- World as one market for all

Zero waste strategies
- Optimize by precision algorithms

Industries 4.0 is a design concept that liaises IoT, Big Data, and AI to build high precision technology

- Agriculture 4.0
- Nature friendly industry 4.0
- Orange Economy
- Education for remote areas
- Start-up aid
- Investor relationship

Woven Agriculture Project: Internet Platform Driven Innovation Super Clusters for Agriculture 4.0

An innovation & research cluster as an incubator and academy for providing bright young researchers and start-ups a co-working foundation to implement their ideas while training farmers and young talents in villages on technology for sustainable agriculture and nature

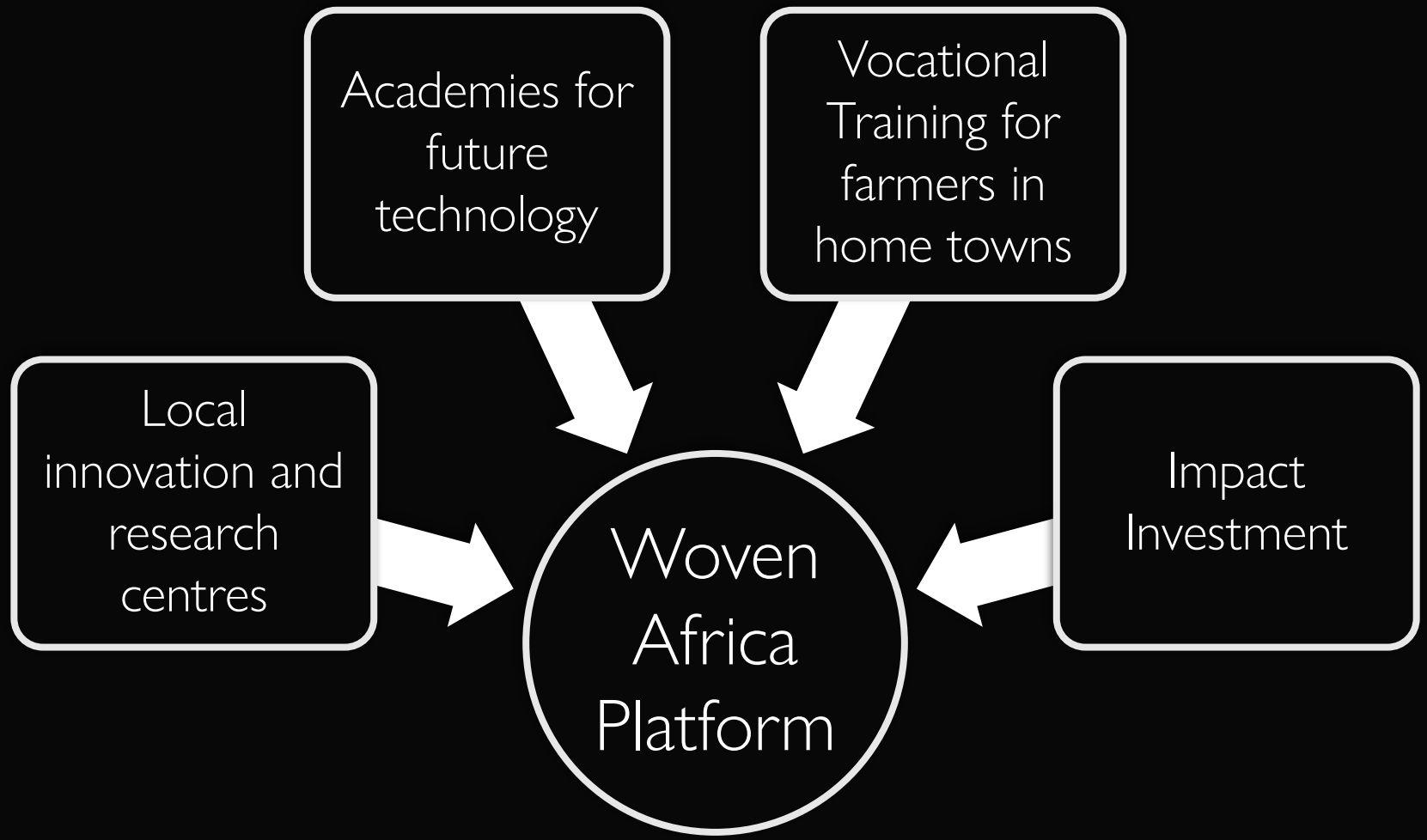
- An internet platform as a virtual umbrella for local innovation centres for young people
- Innovation & research cluster as incubators
- Academy for providing bright young researchers a co-working foundation to implement their ideas
- Vocational training in technology for farmers and workers in villages on sustainable agriculture

Woven Agriculture Eco System

- Multi-lingual Online Education
- Provides media and infrastructure for local innovation centres
- Incubator and research labs for young talents to mature ideas
- Vocational training for farmers and workers in hiome towns
- Centre for impact investment in Africa

Woven Africa is an internet platform that is shared by local innovation centres across Africa to guarantee education in modern technology, give the young talents a place to mature their ideas into market solutions, as well provide vocational training for farmers and workers in home towns.

Artificial intelligence platform to accelerate education and development in rural areas



Woven Agriculture Benefits

- Multi-lingual Online Education
- Media and infrastructure for local innovation
- Incubator and research labs for young talents
- Vocational training for farmers and workers in home towns and native language
- Centre for impact investment in Africa

For local Farmers, artisans and traders

- Learn to benefit from the internet and AI driven technology to close the gap to the north

For Policy Makers

- A central institute to coordinate international relations ships and enhance private sector

For Impact Investors

- Invest in impact agriculture in places where you find motivated young and a desire for sustainability

For Start-ups and researchers

- Share laboratories and technology clouds to concentrate on creating local solutions for the future

Elements of Woven Africa

- Education in rural places
- Support local entrepreneurs
- Agriculture 4.0
- African Commerce Ecosystem

Train the trainer academy
- Keeping trainers ready for the future

Dual studies
- Vocational + college training

Virtual innovation hub
- International cooperation

African data lake
- Data is the gold of the future

Distributed incubation centre
- Physical incubators everywhere

Investor relationship centre
- Permanent committee for investment

Go-to market assistance
- Marketing and back office services

Strategy advise for governments
- Permanent innovation desk for policy makers

Dual studies | Investor relationship centre | Go-to market assistance | Strategy advise for governments

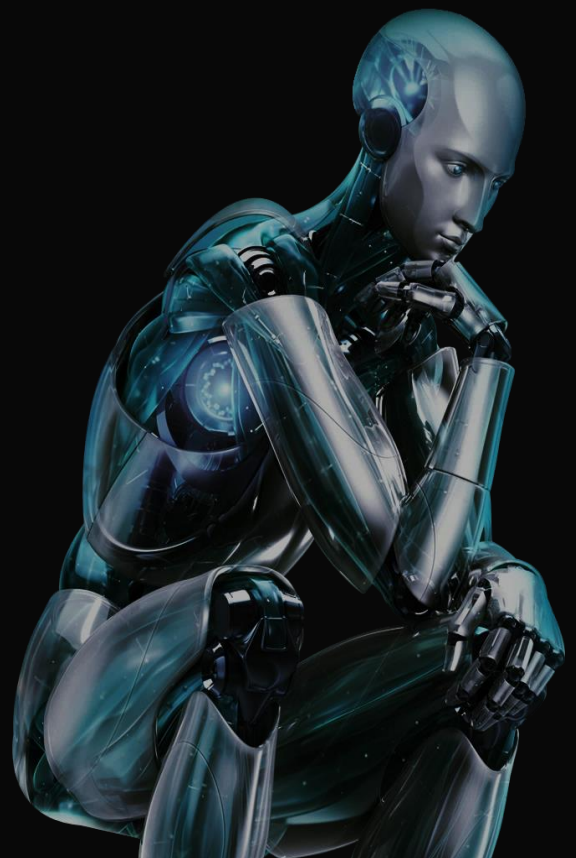
Train the trainer academy | African data lake | Virtual innovation hub | Distributed incubation centre

Education Media Production

The Challenge for Africa

- … good education for the under-privileged
  - Educate people in remote and rural places to avoid their migration to big cities for study
  - Education for those who do not master English, French or the dominant national language
- … African young people in becoming champions in digital technology and mainly in Agriculture 4.0
  - Favour local industries to form local technology solutions
  - Let invent solutions that can be used globally
- … building eco-systems for international trade
  - Blockchain based compliance and quality certification
  - Imagine: African market place "AMAZON" → "SERENGETI"

Agriculture 4.0: Educate for future



- Internet of Things
  - data acquisition
- Big data
  - large data lakes
- World-wide networks
  - information exchange
- Artificial Intelligence
  - analysis, prediction, decisions

- Technology Education
- Local Startup-research
- Precision farming
- Alimentation guarantee
- Independence


Smart Cities
Toyota Woven City Design

Convergence of Smart Cities and Agriculture 4.0

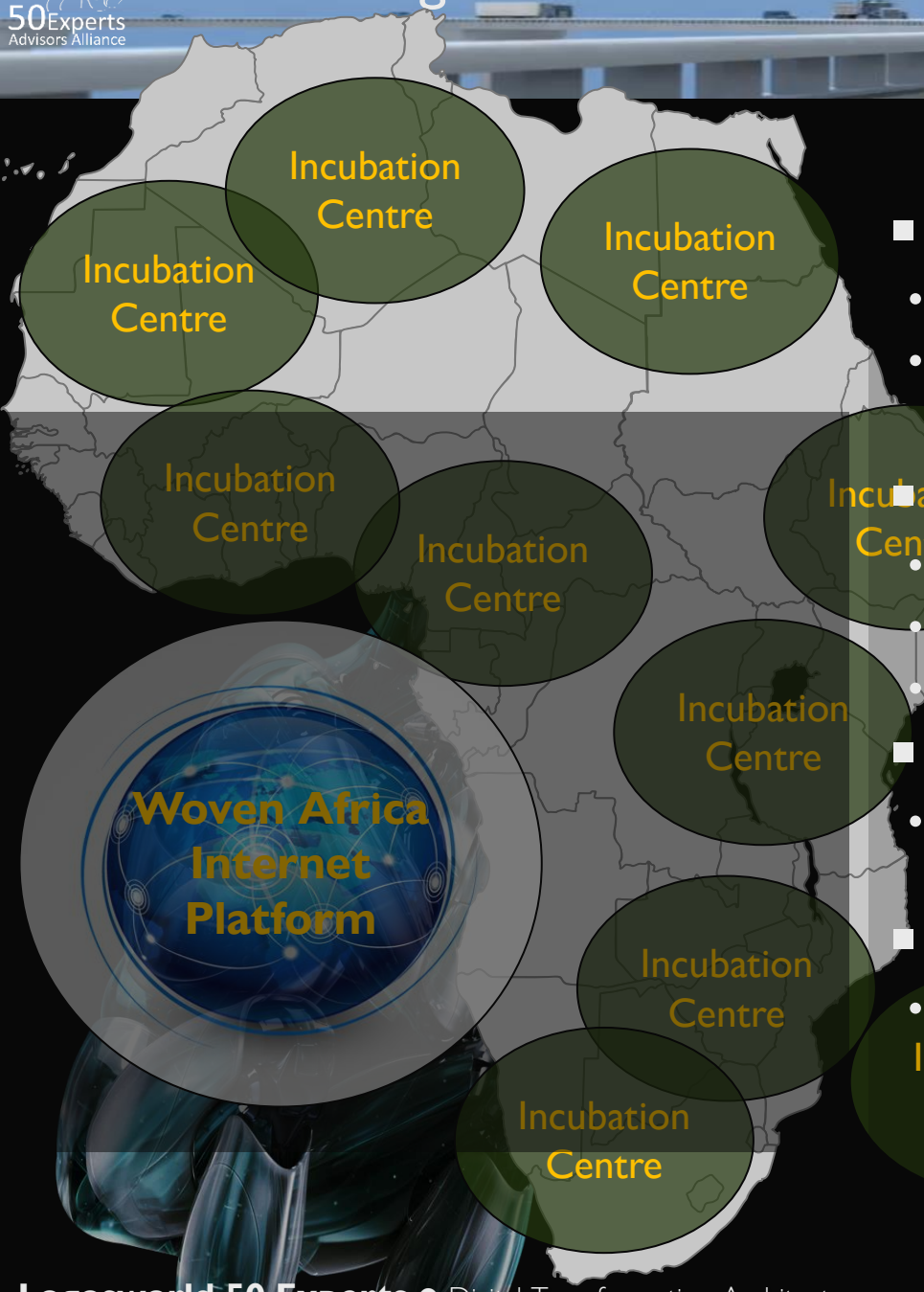
70% of roof-tops in big cities are unused

The can be greened for food production

Challenge:

- Design an eco-system for food from roof-tops
- Build a simulated prototype as a computer game
- Build a miniature world as experimental lab

Ideas for Africa



- Bring together business, tourism and technology
  - Hospitality and tourism school
  - Technology hubs and innovation clusters
- MICE resorts for business + holiday
  - MICE=Meetings, incentives, conference, education
  - Education Centre for special technology topics
  - Conference centre in a resort
- Platform for Supply Chain Compliance Tracking
  - Collect and verify the certificates on compliance with UNHRC workers' compliance
- West-central African Economic Days
  - Congress and marketplace on current topics and needs of the African society and markets in the spirit of WEF Davos

Education for a Better Africa

Teach digital technology to farmers
- Use technology for agriculture 4.0
- Favour ingenuity over mere consumption

An internet based platform for language agnostic digital learning
- AI supported exercises gamified learning
- Exam aligned with international standards

Local incubation and practice centre
- Practice simulation to learn use of devices
- Practical training for workers and farmers

Start-up consulting in remote places
- Encourage the young to stay in their villages
- Build a local internet eco-systems

- Education in rural places and local language
  - Higher education in remote and rural places to avoid migration to big cities for study in a language that they master
- Support local entrepreneurs develop for Africa
  - Allow young talents and local start-ups to develop for the domestic market and build an African pool of IP
- Agriculture 4.0
  - Educate the young to benefit from Artificial Intelligence, IoT and Blockchain on eminent need of agriculture and nature
- Assist in building an African Commerce Ecosystem
  - Assist in building an Africa owned woven internet market ecosystem to resist the power of multinational concerns.

Woven Africa

What we found was that

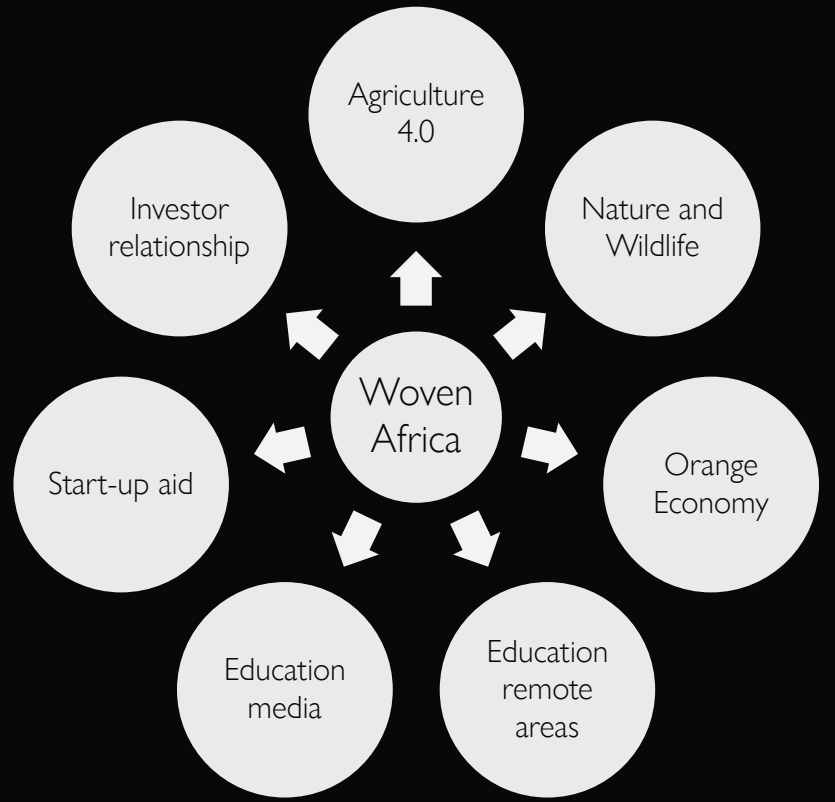
What we found was that delivers the incubator for young local entrepreneurs to shape future based on real needs

Young entrepreneurs are full of precious ideas how to shape the future. With the internet and the rise of the concept of interwoven industry named: “Industry 4.0” there are new ways to make the world smarter.

Education for everybody in using new technology in agriculture and local value chains

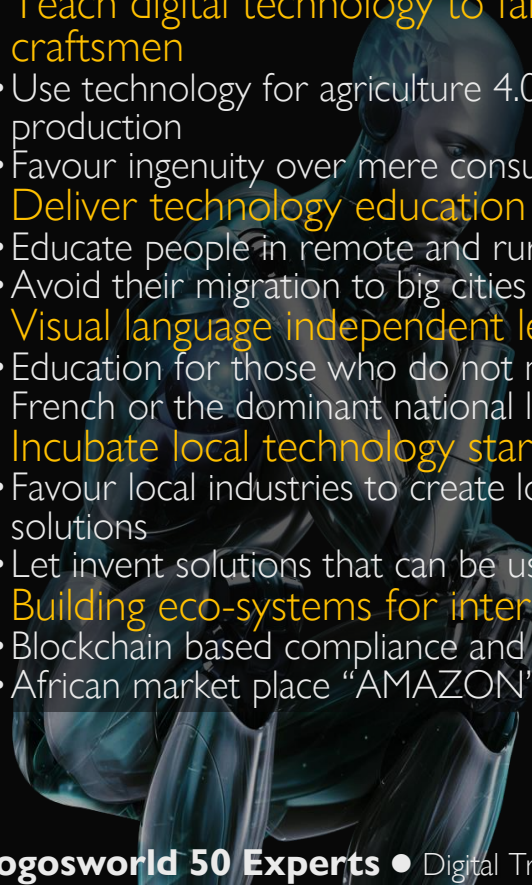
- Agriculture 4.0
- Nature friendly industry 4.0
- Orange Economy
- Education media production
- Education for remote areas
- Start-up aid
- Investor relationship

→ Woven Africa



Prospects for African young people

- Teach digital technology to farmers and craftsmen
  - Use technology for agriculture 4.0 to optimize food production
  - Favour ingenuity over mere consumption
- Deliver technology education to remote areas
  - Educate people in remote and rural places
  - Avoid their migration to big cities for study
- Visual language independent learning
  - Education for those who do not master English, French or the dominant national language
- Incubate local technology start-ups
  - Favour local industries to create local technology solutions
  - Let invent solutions that can be used globally
- Building eco-systems for international trade
  - Blockchain based compliance and quality certification
  - African market place "AMAZON" → "SERENGETI"



An internet based platform that delivers language agnostic content to teach digital technologies

- Gamified content for flipped classrooms
- AI supported exercises
- Content for international exam standards
- Practice simulation to learn use of devices

Local incubation and practice centre

- Allow local students to experiment with IoT
- Practical training for workers and farmers

Start-up consulting in remote places

- Encourage young researchers to stay in their villages

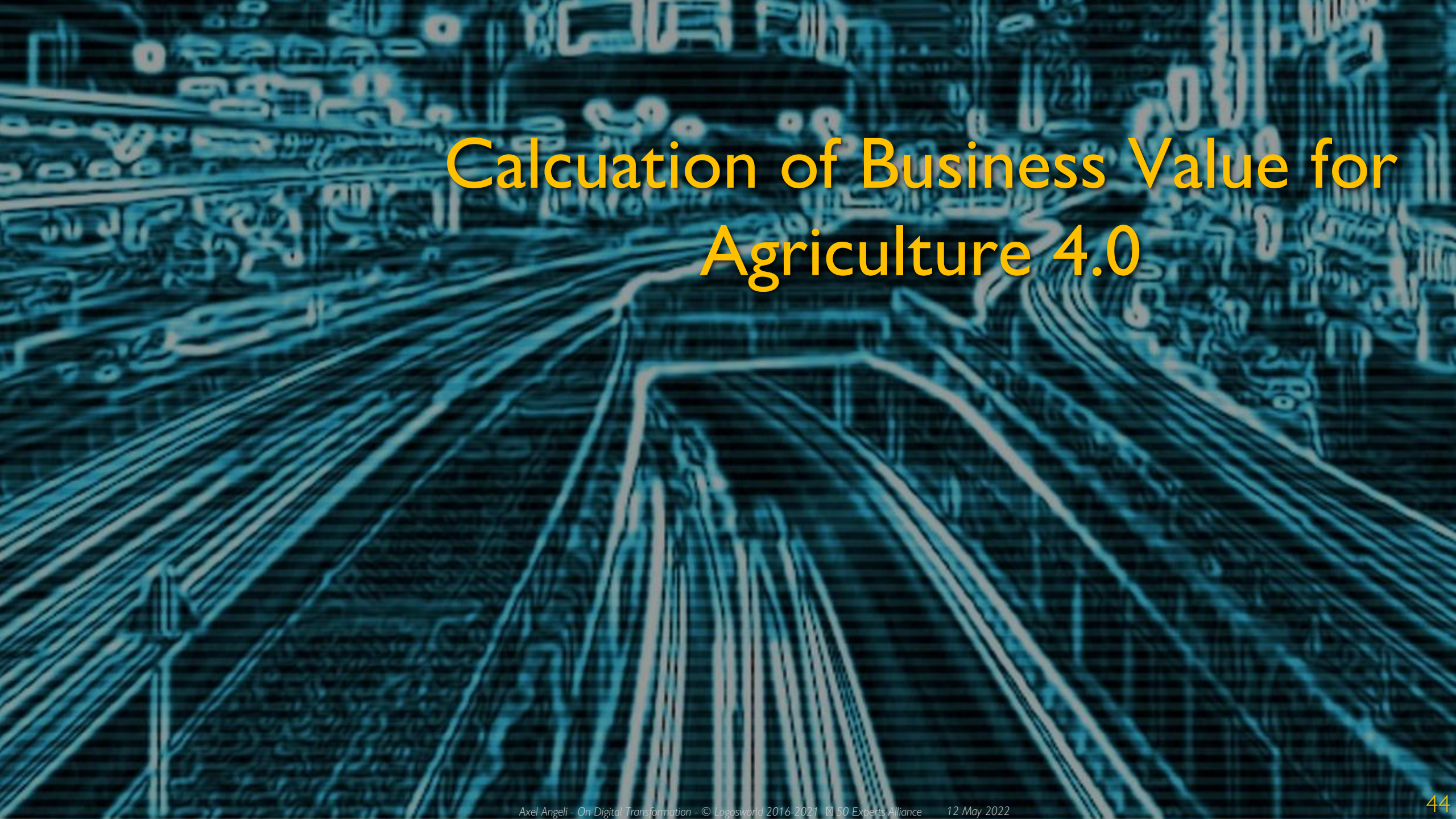
Prospects for African Young people

The Challenge for Africa

- … good education for the under-privileged
  - Educate people in remote places to avoid migration
  - Education in the mother tongue of the people
- … make young people become digital champions
  - Favour local industries to form local technology solutions
  - Let invent solutions that can be used globally
- … building eco-systems for international trade
  - Blockchain based compliance and quality certification
  - Imagine: African market place "AMAZON" → "SERENGETI"

A Solution for Africa

- An internet based platform with language agnostic content to teach digital technologies
  - Gamified content for flipped classrooms
  - AI supported exercises
  - Content for international exam standards
  - Practice simulation to learn use of devices
- Local incubators and practice centre
  - Allow local students to experiment with IoT
  - Practical training for workers and farmers
- Start-up consulting in remote places
  - Encourage young researchers to stay in their villages



Calcuation of Business Value for Agriculture 4.0

DROP Model

Africa's challenges are the fast growing population, economic independence and climate change.

Drivers

Population growth is the main driver for action. Breaking old colonial structures, economic dependencies and climate change are urgent needs.

Requirements

Urgent requirements are alimentation of the population, sustainable education and an infrastructure to preserve the intellectual power and economic independence.

Opportunities

Artificial intelligence based technology opens a wide field for building the future. It will be the ground for precision agriculture, smart cities and sustainable transportation.

Prescriptions

Success is driven by well educated motivated people and a supporting infrastructure for mobility, technology, internet to allows local talents incubate their ideas.

Drivers		
Population growth	Hegemonial heritage	Climate change

Requirements			
Alimentation	Mobility & Migration	Brain retain	Economic independence

Opportunities			
Precision Agriculture	Artificial Intelligence	Smart Cities	Smart transportation

Prescription			
Education	Infrastructure	Public Data Libs	Incubators

Benefits

Students

- Visual learning for non-native speakers
- Gamified learning with Digital Twins
- Train in home towns

Adults

- Skill elevation
- Training on the job

Benefits of Woven Africa

Start-ups

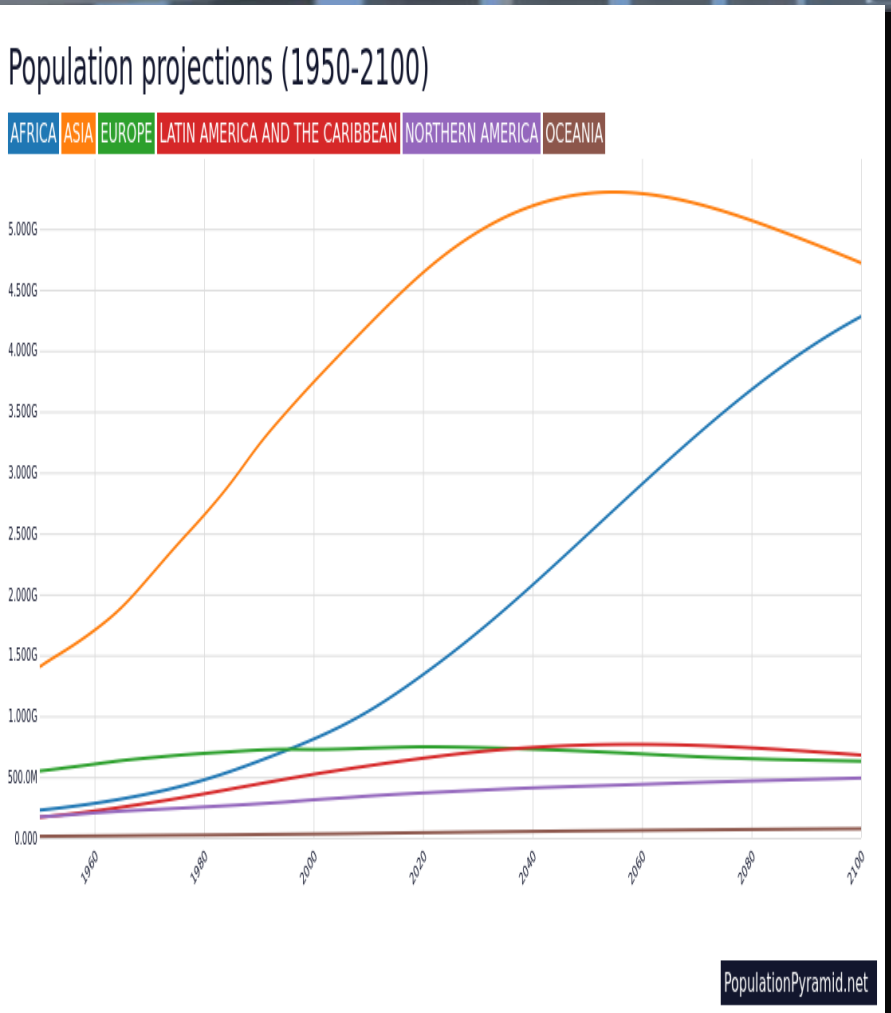
- Incubate solutions
- Investor relationship
- Marketing aid
- Local national IP

Governments

- Data lakes
- Localized digital empowement
- International cooperation

Market Potential

Market potential in Africa: ca. 120Mio EUR/year



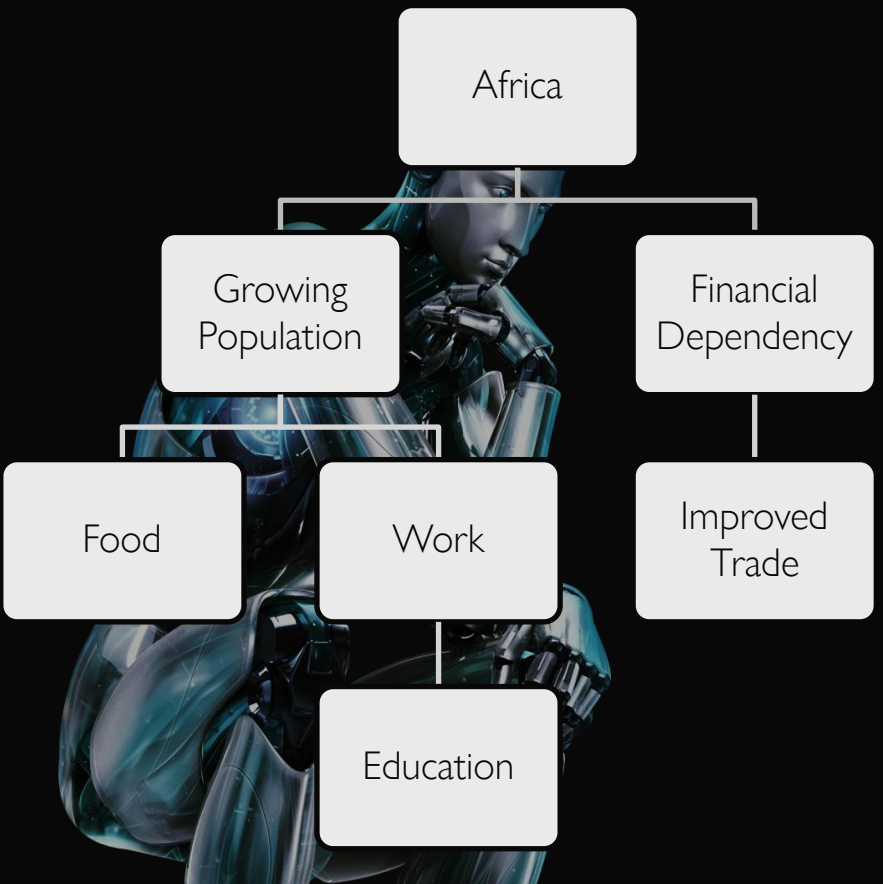
1'321 Mio	Total population in Africa
766 Mio	58% of population less then 24 years old
238 Mio	18% in the age 15-24, this is the population in first time professional education
59 Mio	New students per year, based on 4 year education.
119 Mio	Min. number of sellable course tokens based on 2 required courses per student and year.
EUR 1'189 Mio	Estimated turnover based on an average course price of 10
EUR 119 Mio	Estimated turnover based on realizing 10% of the market potentials.

Population growth:

2020: 1'340 Mio → 2040: 2'070 Mio → 2060: 2'900 Mio

The needs of the coming decades

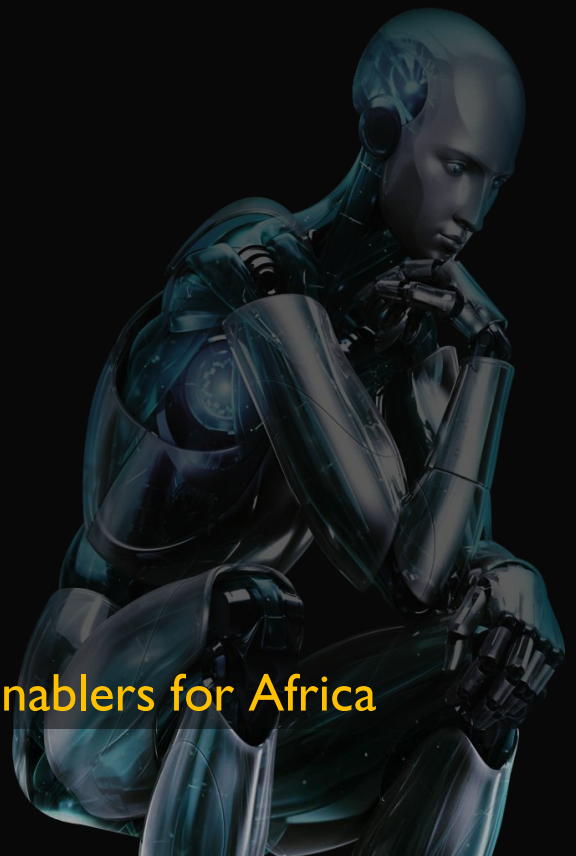
Why we do it



Africa, Caribbean, Pacific, Asia face the challenges of a fast growing population.

- Growing population needs:
  - Education and work
  - Alimentation (Agriculture, Nature, Wildlife)
  - Environment integration and protection
- Start-ups need:
  - Incubators and collaboration
  - Professional investor relationship
- Governments need:
  - Guidance on trends and country development
  - Research and expertise on upcoming trends
  - Assistance in evaluating investment proposals

Agriculture 4.0 is Africa's Chance



Enablers for Africa

Agriculture 4.0 uses modern AI technology to achieve efficient farming while protecting environment

Young people want to learn computer technology and engineering

- There is a need for people who do farm work
- Robots can help with hard manual work
- Young people, can program the robots

This makes young computer specialists who can use the brain for farming

Proposed Solution

Response for future

Woven Africa research and education institute

In a collaborative inter-woven world Africa's nations shall be able to fulfil their own needs autonomously and become a champion in speciality areas.

Nowadays the internet allows access to arbitrary data from any place in the world. A start-up in Africa can deliver the same kind of excellence than one in the USA, Europe or India. The window is now open for Africa to close up.

The secret key to succeed is building infrastructure that allows start-ups and young people to implement their ideas and gives them access to precious resources like laboratory equipment and systematic investor relationship.

A network of co-working incubators would add the needed collaboration space to coordinate research and allow bringing the pieces together.

Woven Africa is a research and education institute and think tank to cater for the needs of

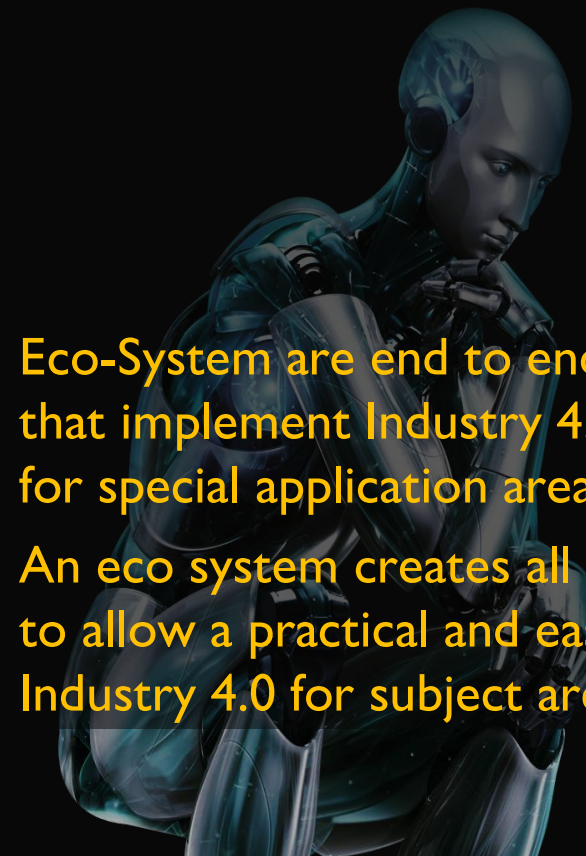
- Alimentation of growing population (incl. Agriculture)
- Environment, Nature and Climate
- Education of students and professionals
- Employment on a wide range
- Orange "creative" economy

for the fast growing population in Africa with a high percentage of very young employable people and favour the disparate rural areas

Building Eco-Systems

How we do it

Woven Africa is an "Ecosystem Builder"



Eco-System are end to end solution that implement Industry 4.0 concept for special application areas.

An eco system creates all components to allow a practical and easy use of Industry 4.0 for subject area specialist.

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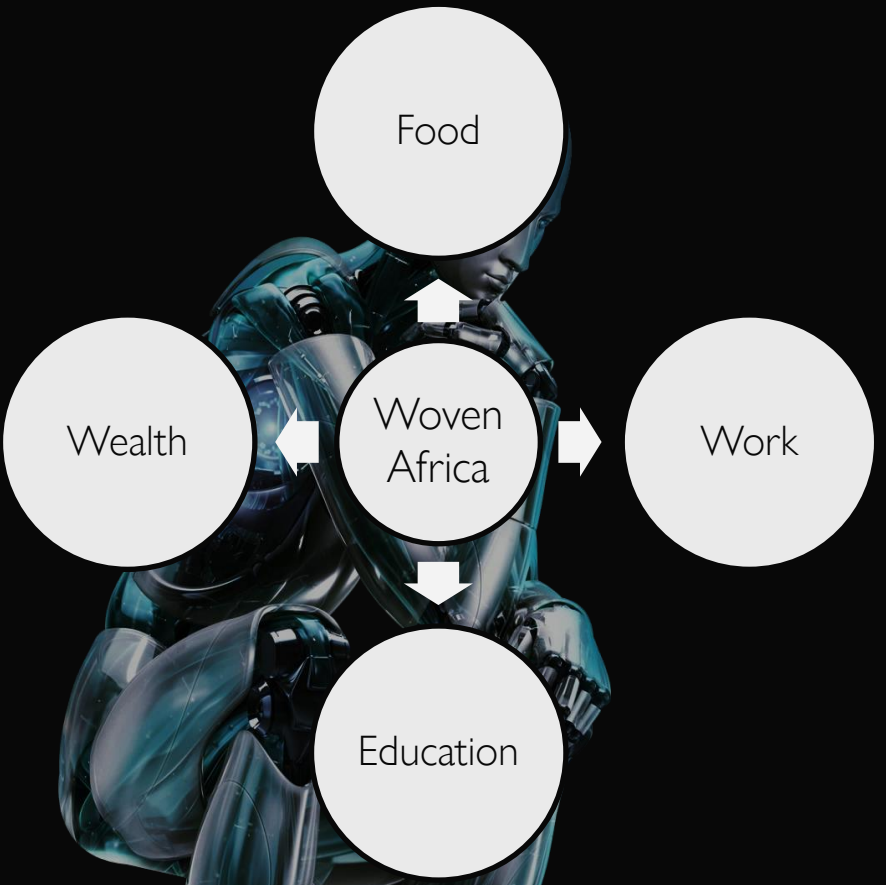
An eco system creates all components to allow a practical and easy use of Industry 4.0 for subject area specialist.

Examples:

- Agriculture 4.0 with (precision farming)
- Heathcare 4.0 for non accessible areas
- Orange Economy

Woven Africa Challenge

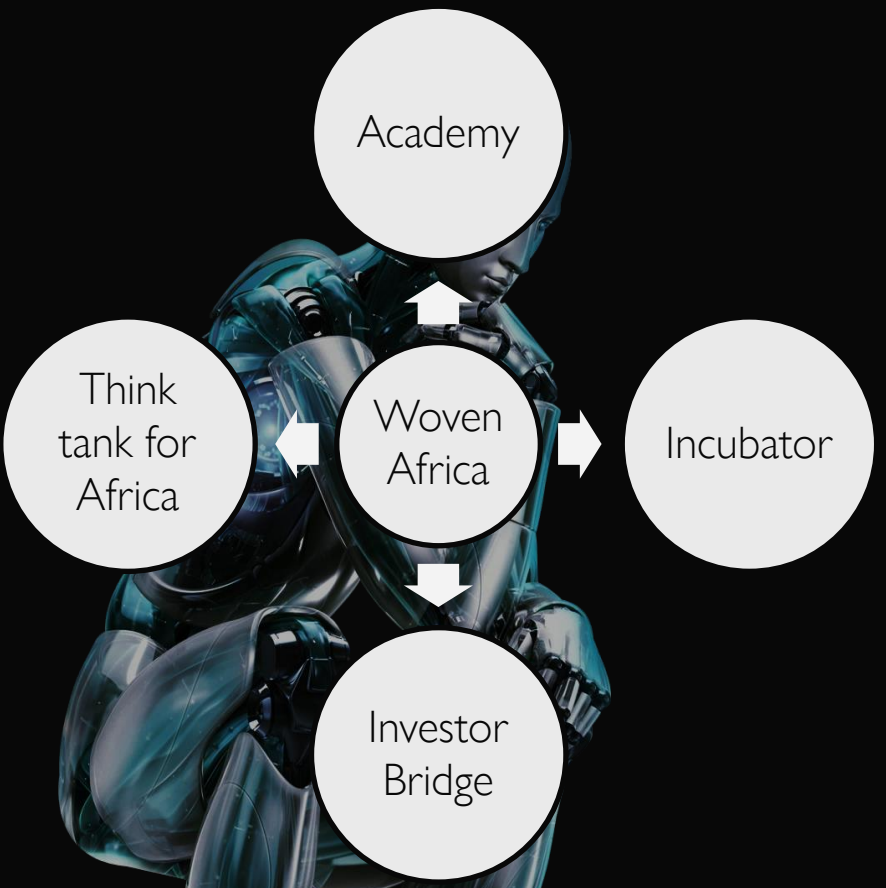
The challenge of all African nations in the present century is finding new ways to guarantee food and work for the growing young and talented population



- Getting better and ecological ways for farming
- Reduce dependencies from foreign trade
- Education for the young population
- Guarantee natural protection and sustainable living
- Compensate the disadvantage of rural areas
- Work and education for living in dignity
- Allow Africa be a world champion and leader in agriculture

Woven Africa Institute

An institute that helps young local entrepreneurs to incubate their business and help the countries with a high number of young people in finding sustainable ways for agriculture through technology



- Woven Africa Academies
  - Education for farmers in using new technology in agriculture
- Woven Africa Incubator Labs
  - Incubator laboratory for start ups to cultivate ideas to improve agriculture with technology
- Woven Africa Investor Bridge
  - Evaluate start-up proposals on behalf of investors
- Woven Africa Think Tank
  - Think tank for finding solutions to make Africa cope with fast rising population and sustainability

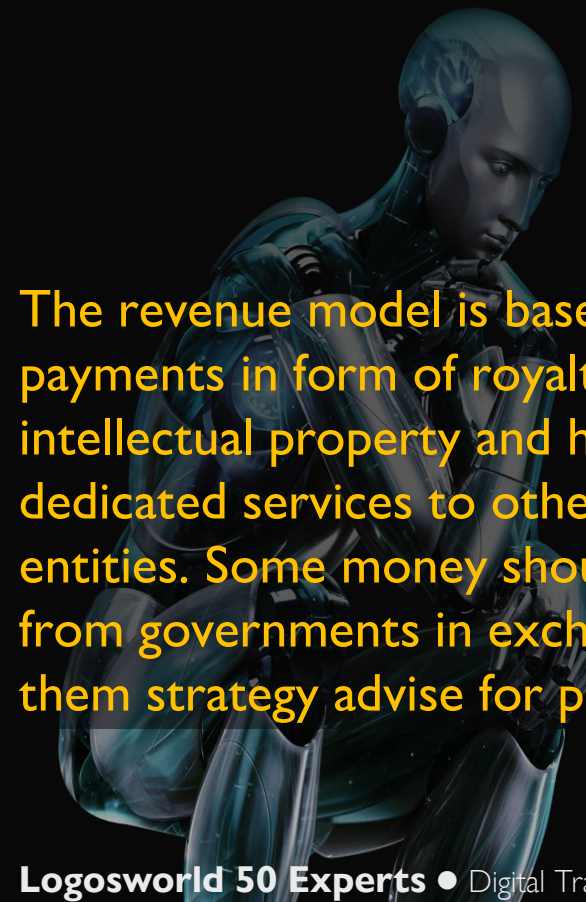
AGRA Project

2006: AGRA project had the ambition to double the income of small farmers by 2020

Famine has still raised in some countries

Agnes Kalibata: Farmers need access to technology, good seeds and good fertilizers.

Revenue models



The revenue model is based on getting payments in form of royalties for intellectual property and honorary for dedicated services to other education entities. Some money should come from governments in exchange of giving them strategy advise for policy making.

Sources of income

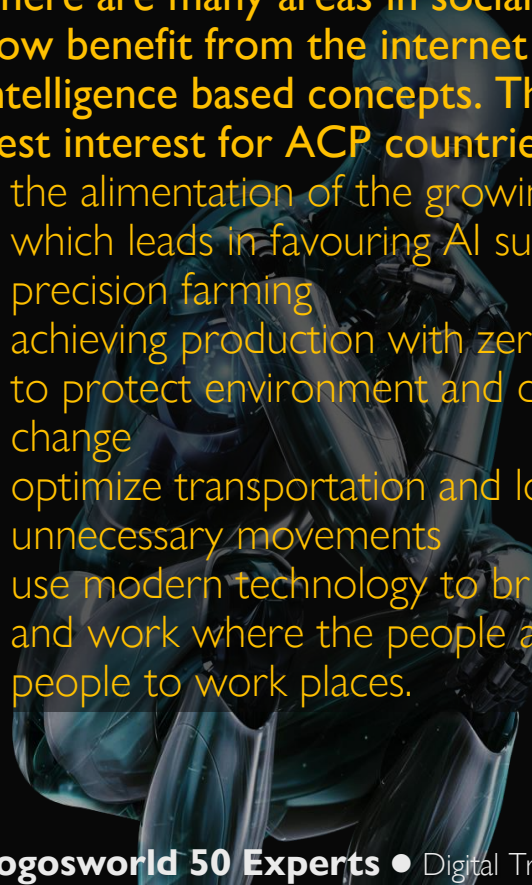
- Royalty from teaching media
- Consulting honorary for contracted research
- Honorary for train-the-trainer
- Government development funds

Areas that require knowledge

Why we do it?

There are many areas in social life that can now benefit from the internet and artificial intelligence based concepts. The areas with best interest for ACP countries are

- the alimentation of the growing population which leads in favouring AI supported precision farming
- achieving production with zero waste in mind to protect environment and defy climate change
- optimize transportation and logistics to reduce unnecessary movements
- use modern technology to bring the education and work where the people are and not bring people to work places.



- Agriculture 4.0 and precision farming
  - Increasing yield of farming while reducing waste and pollution
- Environment and nature protection
  - Use AI to achieve zero waste and cyclic production
- Logistics and Transportation
  - Optimize logistics and transportation with AI
- Education and employment in rural areas
  - Bring the city to people not the people to the city

Woven Africa Business Activities

The concept is built on two main pillars:

A research and incubator hub that primarily orchestrates the research activities and helps young entrepreneurs to make their ideas real.

The hub is complemented by an open university that delivers the learning media and orchestrates the education. There university is open for everybody and meant to reskill and upskill professionals.

Main pillars

Research and incubator hub

- Resident scientists with appropriate administration
- Orchestrate research activities
- Encourage collaboration and knowledge exchange
- Review research proposals
- Offer incubator laboratory
- Offer start-up assistance
- Investor relationship

Open university

- Create learning media
- Online training for everybody
  - Farmers, officials …
- On-premise upskilling
- Professional reskilling
- Academic study support
  - „Train the professor“
- Mobile academy for remote areas
- Regular summits and convention

Woven Research and Incubation Hub

The Research incubator is made from

- Resident researchers with an appropriate administration and the purpose
- Orchestrate research activities
- Invite promising researchers to contribute their work and collaborate
- Offer a solid and comprehensive research habitat for young researchers and endorsed start-up entrepreneurs

Woven Open University

- Primarily produce and publish learning media for topics of common interest to develop the future society
- Offer studies for students and post-graduates
- Offer training courses to individuals and organisation, e.g. farmers, teachers and offcials

Help wanted

- Cooperation with ACP to implement the proposal
- Professional assistance in preparing the proposal for sponsorship
- Participation of local governments

Digital Twins

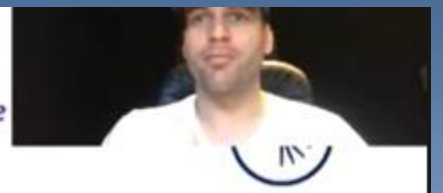
By Axel Angeli

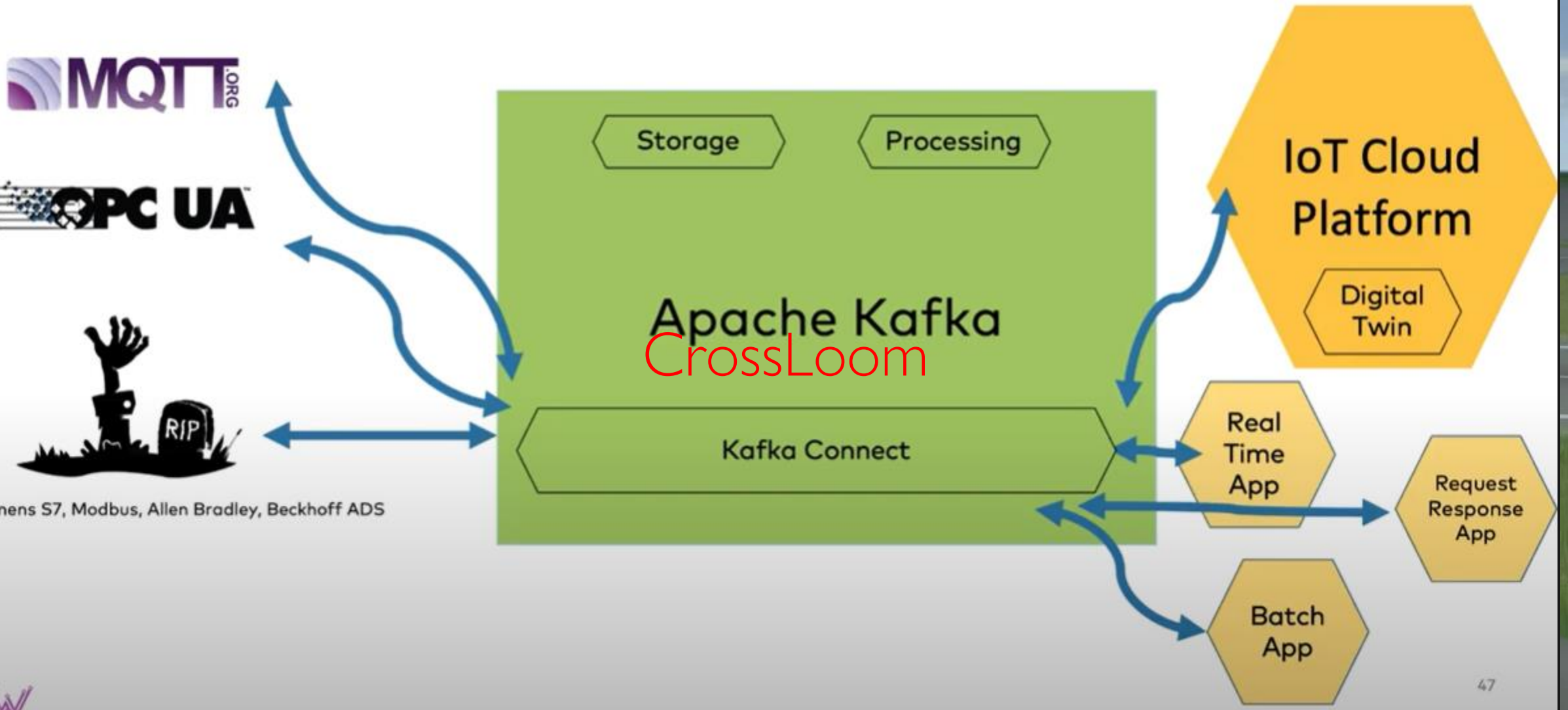
Logosworld 50 Experts

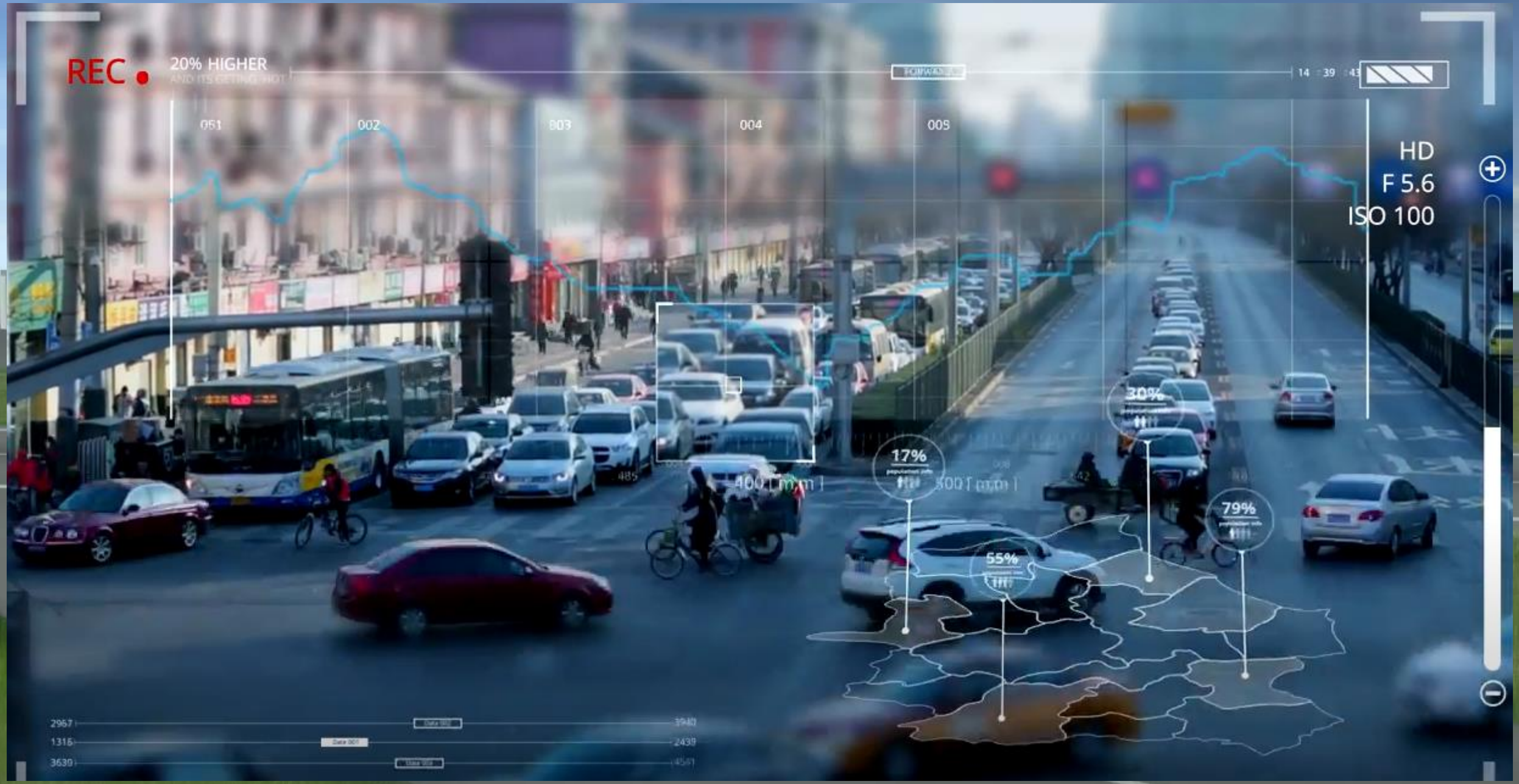
Germany / Luxemburg

Scenario 4: Kafka as IoT Platform

Connectivity
Homogenization
Reprogrammable
Digital traces
Modularity



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55%


Be the Change!
Sometimes …
dreams
are wiser than a plan.
The Woven Agriculture Project

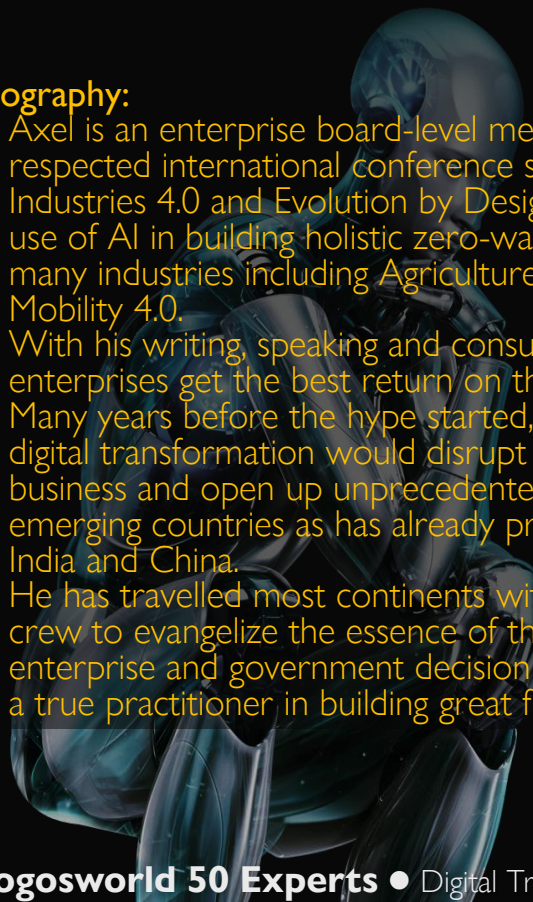
Digital Twins

Axel Angeli

cybernetician

Logosworld Technology & Research GmbH

GERMANY



Biography:

- Axel is an enterprise board-level mentor and a respected international conference speaker for Industries 4.0 and Evolution by Design. He teaches the use of AI in building holistic zero-waste ecosystems for many industries including Agriculture 4.0 and Logistics & Mobility 4.0.
- With his writing, speaking and consulting, he helps enterprises get the best return on their investment. Many years before the hype started, Axel predicted that digital transformation would disrupt the rules for global business and open up unprecedented opportunities for emerging countries as has already proved to be reality in India and China.
- He has travelled most continents with his distinguished crew to evangelize the essence of the 4.0 economy to enterprise and government decision makers and assist as a true practitioner in building great future strategies.