Blockchain solution for Traceability and Sustainability in the cotton value chain

Sub-Group 4 – Capacity Building
"Conducts Pilots, Training and Awareness raising for traceability and transparency of sustainable value chains".

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26 I 02 I 2020, Virtual meeting #3 Sub-group 4

Agenda - Virtual Meeting 26.02.2020

1. Pilot Project

2. Scope and Targets (as per from questionnaires)

3. Partners

4. Plan

5. Next Steps

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Pilot #1 - Implementing a blockchain technology for traceability and due diligence in the cotton value chain in support of a circular economy

from Project Chart – starting input for drawing a project plan

OVERALL OBJECTIVE

OO: To enhance the traceability and due diligence in the cotton value chain through the implementation of blockchain technology, to support a circular economy approach.

EXPECTED ACCOMPLISHMENTS

EA1: Proof the possibility of increased connectivity and cost-efficiency based upon the use of blockchain technology and strengthened capacity to source more sustainably for retailers, brands and manufacturers along the cotton value chain

EA2: Demonstrate the capacity of companies operating in the cotton value chain to take risk-informed decisions and use a set of internationally agreed traceability and sustainability standards;

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from 2019.12.18 Telco Meeting – starting input for drawing a project plan

1. A Proof of Concept (PoC) for a transparency and traceability blockchain-based system for sustainable cotton value chains, developed by the end of 2020;

2. One technical solution to address the issue of accessing data on sustainability performance by the end of 2020;

3. At least 1 brand and 4 manufacturers/farmers participate in the pilot project and fully test the blockchain-based system developed by the project by the end of 2020;

4. At least 30 stakeholders (including brands, manufacturers and farmers) are trained in the use of the blockchain system developed by the project by the end of 2020.

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WHAT TO ACHIEVE

- Traceability from seed to final product

- Not only for processes that requires a physical segregation (e.g. organic)

- Inclusion of certificates over the whole supply chain and different standards

- Testing of blockchain as enabler of traceability and transparency

REQUIREMENTS FOR SUCCESS

- Limited complexity

- Defined expert core team

- Short and clear communication

- Agile development

- Building on an what exists

- Open-source

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Project Execution Approach: progressive definition of needs and goals achievement

Idea → Concept → Requirements → Procurement → Development → Testing → Implementation → Consolidation → Validation → Results

Pilot Project Goals

Today

Waterfall Project Management   Agile Project Management   Waterfall Project Management

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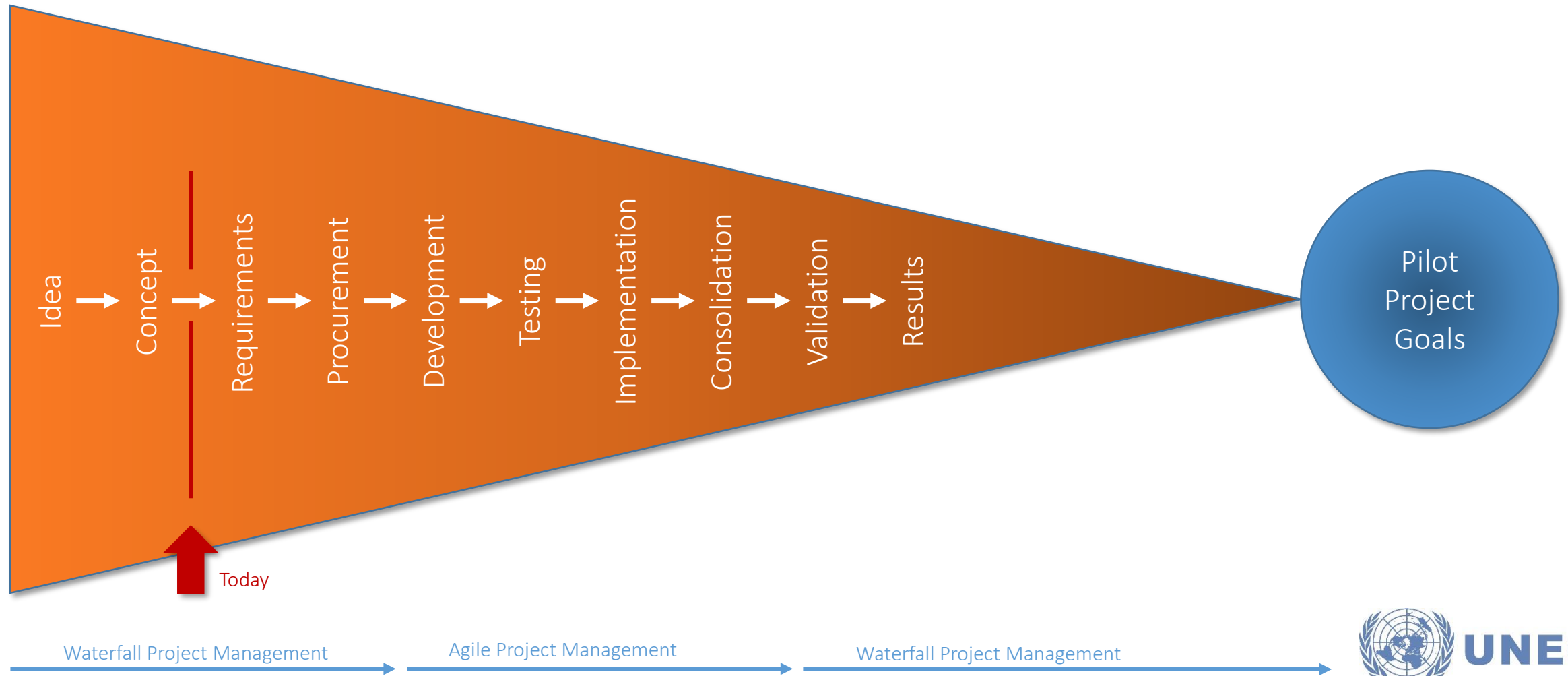
MAIN RESULTS FROM QUESTIONNAIRES – PRESENTATION AND DISCUSSION

IN SCOPE

- Traceability and proof of source should be the sole focus.
- Core components are: Smart Contracts and off-chain systems used (databases, IPFS, ...)
- Development of open source UI interfaces to interact with items and company profiles
- I would recommend Ethereum Virtual Machine
- It is thus very important to involve as many possible intermediaries in the production chain, including the logistics companies if possible.
- in the production chain, it could be possible to only track the product at the entry point or exit point of these steps, to simplify the pilot.
- the pilot has to have the basic information and trace the basic steps of the process. In a second step it could be enhanced and further implemented.
- to explore the reduction of bureaucracy among the participants.
- to understand the cost-benefit of this traceable process via blockchain.

OUT OF SCOPE

- Trade finance and other financial matters
- Advanced and detailed steps of the supply chain process
- All the processing activities like sales, consumption, disposal and post-consumption

FOR DISCUSSION

- The larger blockchain setup, e.g. consortium or public chain
- Transparency and traceability have to be put in place in the real process .
- In the fashion industry, the real manufacturing process is quite complicated and if we want to trace everything from the beginning to the end, I think it will take an enormous effort and a lot of time.

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MAIN RESULTS FROM QUESTIONNAIRES – PRESENTATION AND DISCUSSION

IN SCOPE	OUT OF SCOPE	FOR DISCUSSION
- establishing the viability of the deployment of traceability tech into the supply chain - It should be considered to include a training concept in the project so that the assigned staff is capable of working with the technology - the essential supply-chain with a wide enough sample range to be able to draw viable conclusions - narrow down the scope as much as possible - It should focus on the minimum set of data needed to ensure traceability - put cotton transparency in question (not the whole chain)	- Customs processes and regulations from different countries.	- utilising blockchain to integrate NSOP (National Standards of Organic Production, e.g. APEDA, USDA, EU standards) to the International Production standards (e.g. OCS and GOTS). Because that is something not happening yet and is bit of a mystery black box in the supply chain.

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MAIN RESULTS FROM QUESTIONNAIRES – PRESENTATION AND DISCUSSION

KEY PARTNERS	NOT RELEVANT	FOR DISCUSSION
- Farmers, Mills + Manufacturers, Retailers and the Technology providers - One farmer, a spinner, a dyeing, a weaver, a finisher (if not inside the weaver), a garment maker , a brand and one auditor - On-the-ground training and certification bodies, and the communities and cooperatives that will be participating in the pilot - the entire textile production chain (Production of Fibres; Spinning-, Weaving-, Knitting Mills; Finishing Facilities; Manufacturers of ready-made Clothes), Standard Bodies, Retailers - Certifying and auditing organisations	- Consumer, Disposal and Recycler	- see later key players of the supply chain in example (as a reference)

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MAIN RESULTS FROM QUESTIONNAIRES – PRESENTATION AND DISCUSSION

PROCESSING ACTIVITIES	NOT RELEVANT	FOR DISCUSSION
- Seed to Assembling should only be tracked through reputational certification - A few processes, could be tried out in more details - Cultivation to Distribution - Cultivation, Spinning, Dyeing, Weaving, Finishing, Garment manufacturing, sales - from the farm to the store - We could track everyone, but the important thing is that we start tracking something and we can add more stages as the pilot progresses - Harvest to Sales		- Consumption, Disposal and Post-Consumption

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MAIN RESULTS FROM QUESTIONNAIRES – PRESENTATION AND DISCUSSION

BLOCKCHAIN CHARACTERISTICS	NOT RELEVANT	FOR DISCUSSION
- Open-Source software - Public - Permissioned - For a pilot phase, a permissioned blockchain is an appropriate place to start until the concept is proven - A mix of open-source software and proprietary software can be used. - All blockchain software and smart contracts should be open source. - A permissioned blockchain can later be made public while the opposite is not true. - A public blockchain increases visibility and could create some buzz around the project - For the initial limited scope project could be hybrid approach - Open-source is important for the nature of the pilots developed by UNECE and the future of its development in different applications - We don't want proprietary out-of-the-box software	- Proprietary Software	- Hybrid public and permissioned - The setup of the blockchain, depends use cases and the level of transparency. For the initial pilot a permissioned chain is probably the better fit. But plans should be in place for an actual world wide supply chain system, using a public more decentralized approach

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MAIN RESULTS FROM QUESTIONNAIRES – PRESENTATION AND DISCUSSION

B2B TRANSACTIONS	NOT RELEVANT	FOR DISCUSSION
- Auditing and Sustainability and certification - Financial transactions/value exchange - In order to not defocus, we should limit the pilot to looking at sustainability and certification	- Not standardisable transactions	- Contracts, material purchase order, order management, material quality management, product process management - Customs transactions

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MAIN RESULTS FROM QUESTIONNAIRES SECTION 2 LESSONS LEARNED– PRESENTATION AND DISCUSSION

1. Missing stakeholders:
- Raw material suppliers
- Suppliers beyond tier 2 (e.g. spinners, cooperatives)
- Product and engineering actors
- Retailers
- Government bodies
- Transporters/traders
- Financial flow actors
- Certifications bodies

2. Technology importance:
- Is instrumental, a tool for impactful processes and incentives
- Benefits: digitization, data collection, process modernization
- Blockchain: transparent and tamper proof time-stamped records of events
- For a seamless process flow and information

3. Awareness-raising/Education:
- Functionality of blockchain
- Differences in public versus private / permissioned systems
- Review key technology concepts (workshop)
- Good understanding: data collection and use in the blockchain, data trust

4. Legislation:
- Consider privacy protection legislation i.e. GDPR compliance
- Regulatory bodies to facilitate blockchain solutions :
  o accountability issues
  o consumer information
  o reliable sustainability claims

5. Governance:
- Clear governance all along is critical
- Aligning incentives and stakeholders
- Stimulate partners' eagerness to participate

6. Data Security:
- Data security and protection is a key topic
- Data immutability and user management
- Easier to manage from a permissioned blockchain
- T&C's, NDA', internal protocols, …

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MAIN RESULTS FROM QUESTIONNAIRES SECTION 2 LESSONS LEARNED– PRESENTATION AND DISCUSSION

7. Existing blockchain standard:
- No specific blockchain standard identified to date
- Selfdom defined
- Create a standard under this pilot for easy uptake for all companies (i.e. including with limited resources)

8. User-friendly software:
- Good UX software is a critical successful criterion for adoption and good use
- User experience: simplified front end users applications (minimal buttons and fields, visual and tactile feedback)
- Have a user tech testing survey beforehand to test user experience on interface and design

9. Workload:
- Automated as much as possible
- Roles to be defined from the very beginning with piloting partners for good engagement: will entail additional work at the early stages to be balanced as the project yield cost and time savings

10. Risk-assessment exercise:
- Experts agree on running this exercise prior to the starting of the project, potentially throughout

11. Data reliability versus proof of the process:
- Experts agree that the focus is more important on the proof of the process rather than on data reliability (granularity tbd)

12. Onboarding and educating partners:
- Crucial all along the project to have everyone efforts aligned
- User interface to support partners willingness to achieving their goals (working group, user interviews, training sessions, demos)
- Ensure the technology can be used after the initial field tests for deployment

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MAIN RESULTS FROM QUESTIONNAIRES SECTION 2 LESSONS LEARNED – PRESENTATION AND DISCUSSION

13. Complexity level for a scalable and replicable result

- Start simple and grow complex, keeping the data required as simple as possible (foster partners engagement)
- Additional data to be requested at a later stage
- Focus on the actual business solution to develop modular solutions which can be substituted if standards evolve
- Depends on the relationship with direct suppliers and level of trust
- ERP systems could be used to narrow down the data scope with partners

14. Standardized master data:

- Experts agree that standardization is key
- Important to leave room for more input and explanations still.
- Standard identifier to ensure the common understanding of the outcome
- Rather than facing companies' resistance, it is better to collect first data companies are willing to give and use analytics on what is consensual.

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MAIN RESULTS FROM QUESTIONNAIRES SECTION 2 LESSONS LEARNED – PRESENTATION AND DISCUSSION

1. Demonstrating **end-to-end traceability** and prove the product certifications

2. **Scalability** of the pilot

3. Open **communication and alignment** between the piloting partners (scope, expectations, roles and responsibilities)

4. **Good understanding** of the process to model on a blockchain in the requirements

5. Rolling out several test scenarios

6. Keeping the **pilot focused** (without attempt to combine it with other IT initiatives)

7. **Technology** effectiveness and reliability

8. Understanding the on-the-ground **operating environments**

9. Breaking the project into progressive phases with **measurable goals**

10. Identify the important **data collection points** (e.g. site visits to key supplier chain members)

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MAIN RESULTS FROM QUESTIONNAIRES SECTION 2 LESSONS LEARNED – PRESENTATION AND DISCUSSION

- **H1** Identify the incorrect sustainability claims

- **H2** Provide high visibility to all supply chain stakeholders with the traceability system developed

- **H3** The digital platform for blockchain developed will enable easy access and participation

- **H4** The solution can be operated by value chain actors without relying on external assistance

- **H5** Reduced administration processing time

- **H6** The origin of goods can be tracked across all tiers and end-to-end process definition

- **H7** Volume reconciliation is achievable from the farm to gin segment and then to later segments

- **H8** Gain knowledge about the different permission steps to be used in a permissioned blockchain

OTHER HYPOTHESES:

- **H:** Video-training is sufficient to onboard supply chain participants (majority of cases)

- **H:** The inclusion of anonymous worker reports can help identifying supply chain incidents which are not identified in third-party assessment.
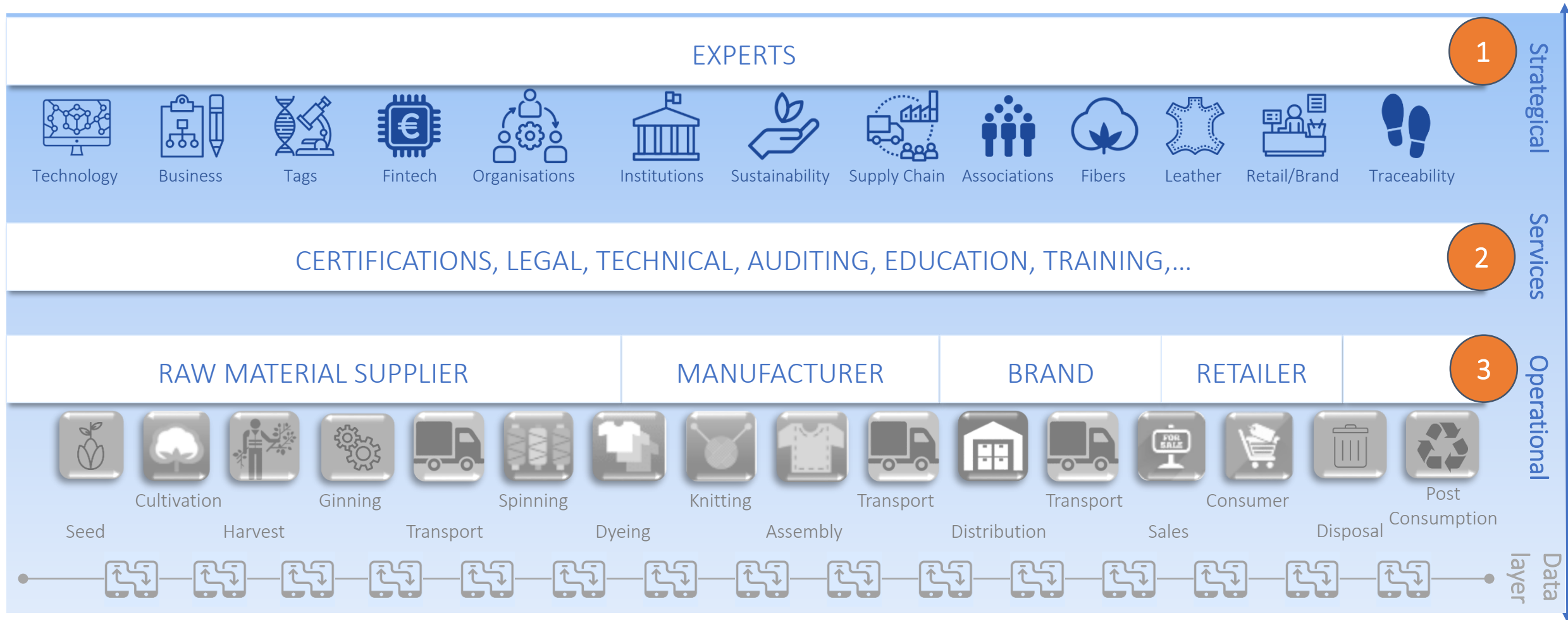
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Group of Experts for the Pilot Project by Area

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Pilot Project - Blockchain

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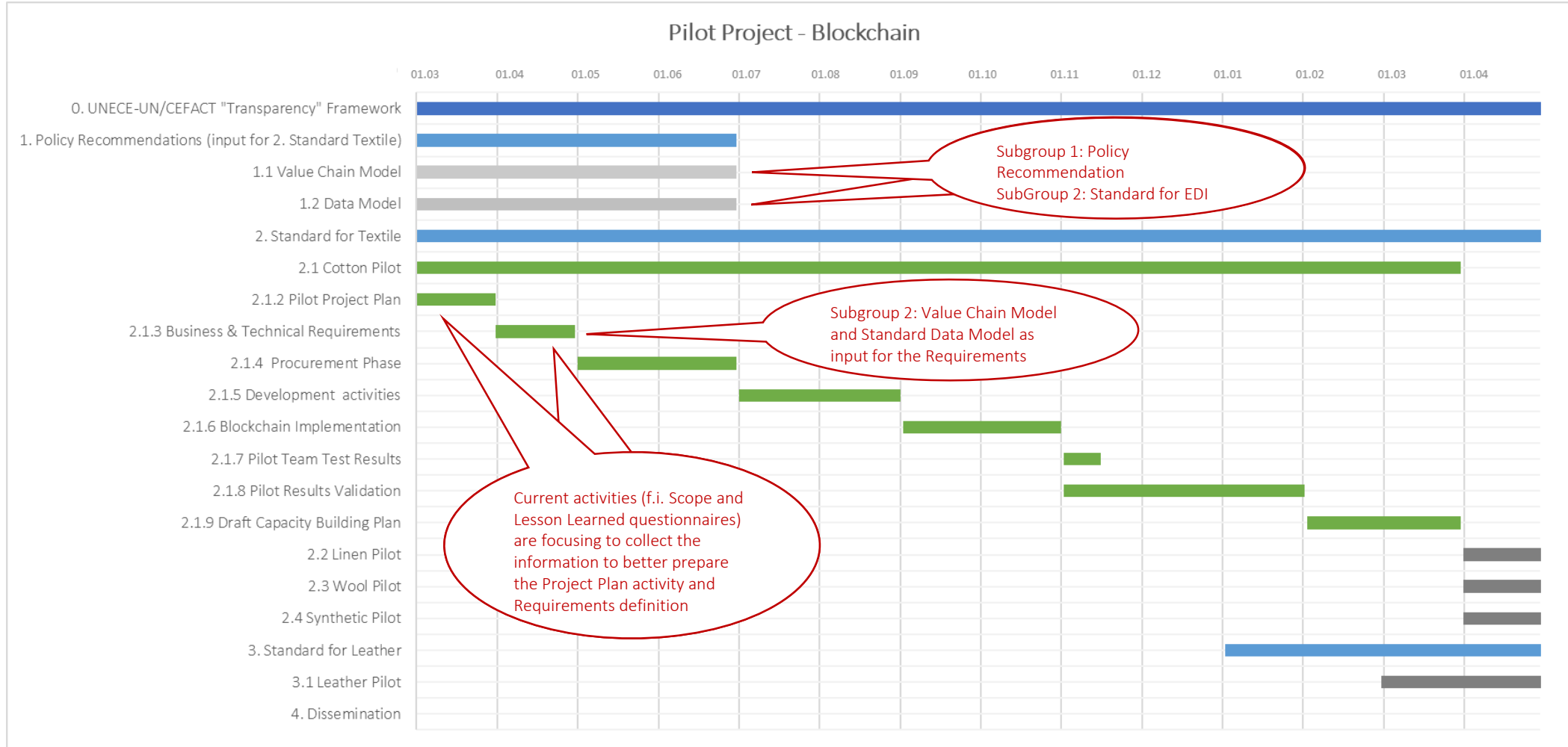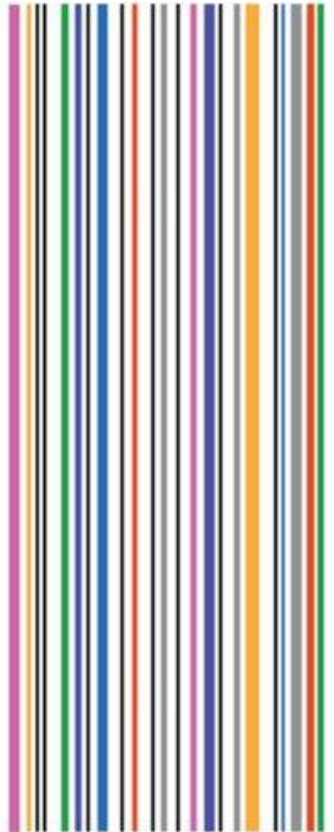
NEXT STEPS

1. Information Concept

   - User Stories

   - Value Chain and Data Model

   - Mockup and Look like

2. Project Plan detailed

   - Scope, Targets, Stakeholders, Organization and Timeline

   - Work-breakdown Structure and Responsibility Assignment Matrix

   - Risk Analysis and Contingency Plan

3. **Virtual Meeting in March** 25/03/2020 – 15:30 CET

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Thank you for your kind contribution

For any follow up, please contact:

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- Andrea Redaelli