

STANDARDISATION OF TEXTILE VALUE CHAINS

This document contains a preliminary proposal of the information structure for the standardization of information exchange in textile value chains. The focus is on product information, and in cotton value chains.

The document does not provide an indepth discussion of track and trace issues (covered by implementation of EPCIS and or TT plant products).

The proposed naming and definitions, attributes , code list, are a preliminary proposal for discussion.

This work is based on the UN/CEFACT Core Component Library for TTplant, eCROP, eLAB messages, and input sor far received from project experts.

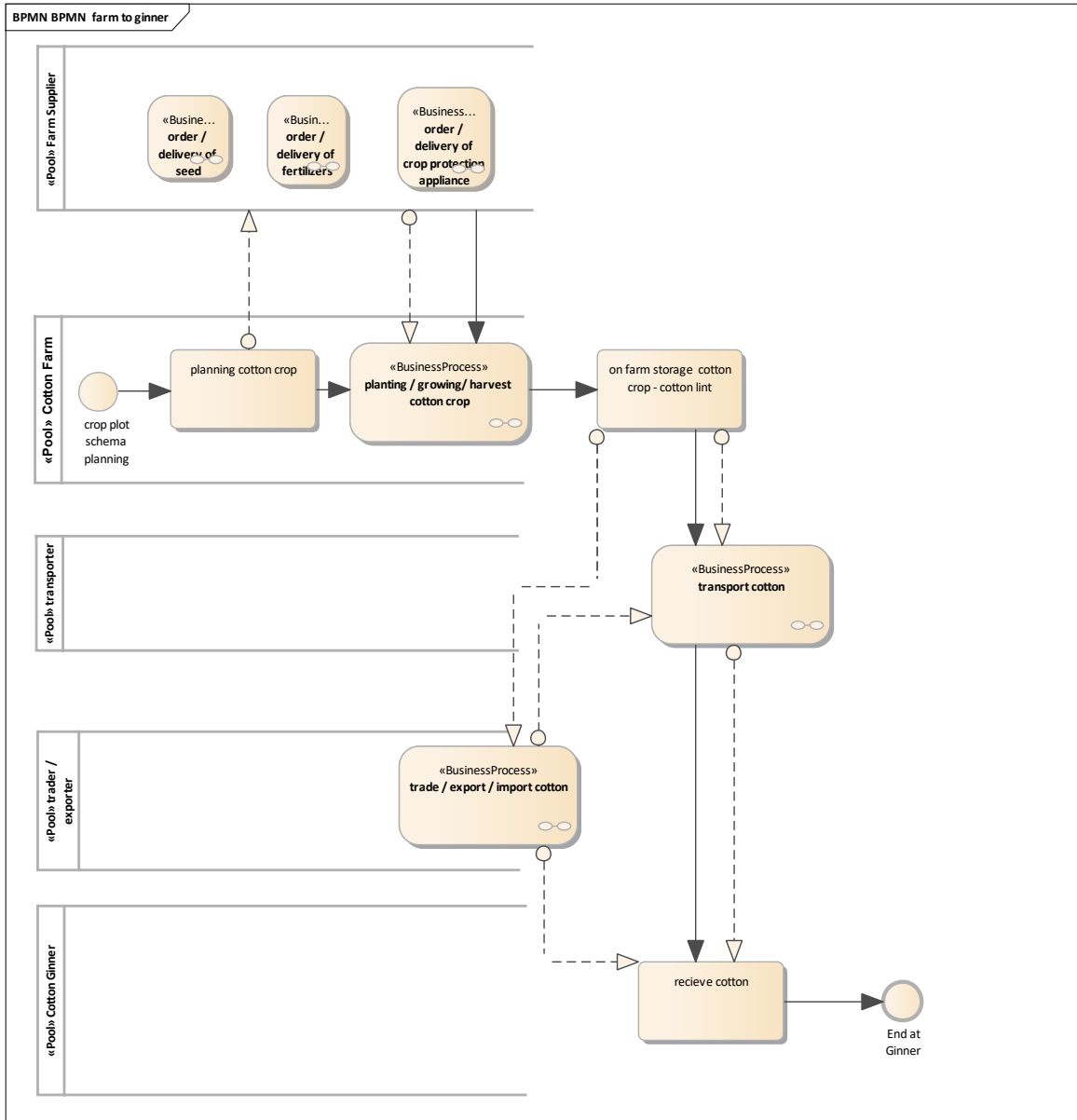
Acronyms:

- a. **BPMN** (Business process modelling notation)
- b. **ABIE** (Aggregate business information entity),
- c. **ASBIE** (Associated Business Information Entity),
- d. **BBIE** (Basic Business Informtion Entity)
- e. **TT** (track and Trace)
- f. **ITC (International Trade Centre)**
- g. **SAC (Sustainable Apparel Coalifion)**

I. Process diagram from cotton farm and farmer up to the ginner and ginner.

Process:

- | | |
|--|---|
| <p>“Pool” Farm Supplier</p> <ol style="list-style-type: none"> 1. Order delivery of seeds 2. Order delivery of fertilizers <p>“Pool” Cotton Farm</p> <ol style="list-style-type: none"> 3. Order delivery of crop protection appliance 4. Planting/growing/harvest cotton crop 5. On farm storage cotton crop | <p>“Pool” Transporter</p> <ol style="list-style-type: none"> 6. Transport cotton <p>“Pool” Trader/Exporter</p> <ol style="list-style-type: none"> 7. Trade export/import cotton <p>“Pool” Cotton Ginner</p> <ol style="list-style-type: none"> 8. Receive cotton 9. End at ginner |
|--|---|

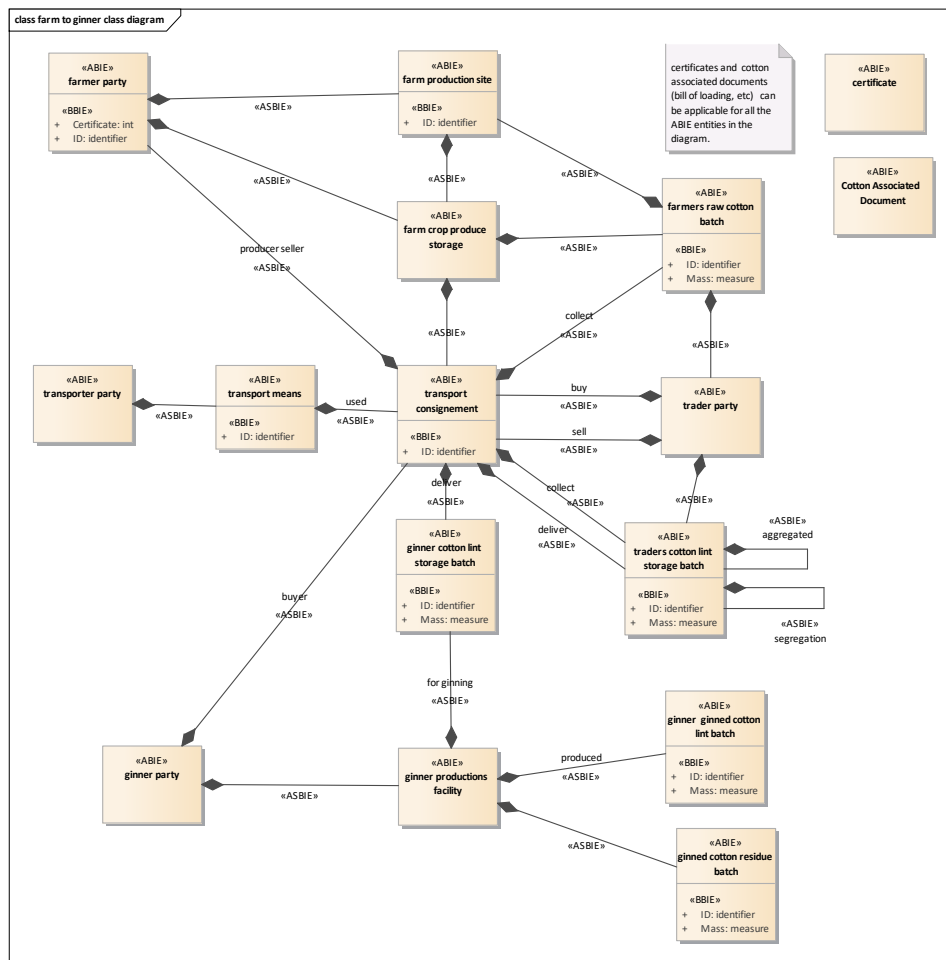


II. Class diagram information exchange from cotton farm and farmer up to the ginnery and ginner.

1. Farmer party (certificate, ID)
2. Farm production site (ID)
3. Farm crop produce storage
4. Farmer raw cotton batch (ID, mass:measure)
5. Certificate
6. Cotton Associated Document
7. Trader party
8. Trader cotton int storage batch
9. Transporter party
10. Transport consignment (ID)
11. Transport means (ID)
12. Ginner cotton Lint storage batch
13. Traders cotton lint storage batch
14. Ginner party
15. Ginner production facility
16. Ginner ginned cotton lint batch
17. Ginned cotton residue batch

Remarks:

- In all class diagrams, the naming and specifications is indicative.
- Definitions are not yet set.
- In case of reusage from other UN/CEFACT messages the original name parts are in brackets ().
- The definitions and attributes are not updated
- These class diagrams are for a first discussion only.
- In this diagram many entities (ABIE) are very similar. A farmer party, transporter party, trader party and ginner party are all parties, but have a different role in the process.
- Same for field, storage and production facility. The commonality in these are it are all locations where a process can occur.

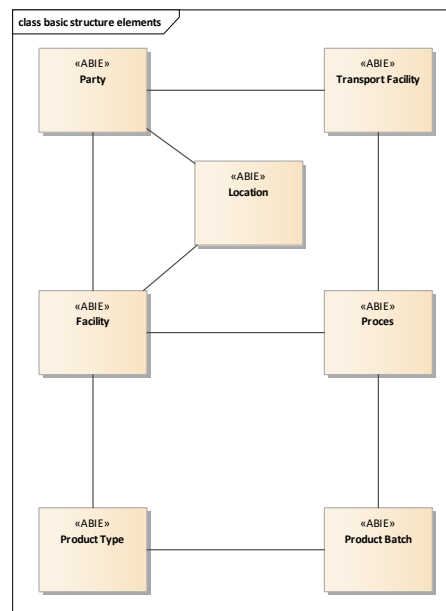


III. Class diagram basic structure elements

1. Party
2. Transport Facility
3. Location
4. Facility
5. Process
6. Product type
7. Product batch

I. Remarks:

- The same situation occurs with the different product batches.
- Based on this, the next class diagram is produced.
- The information entities are named and defined at a more abstract level.
- This more abstract class diagram is applicable for the full supply chain, from farm to consumer and may also cover a circular economy approach.



- These seven basic information entities are the basis for all information exchange in the supply chain.
- It depends upon the information demands of a party (producer, trader, regulator, brand/retailer or consumer) what is the **granularity** of the information, what is the level of detail for an individual product, a product batch and the product history.

Options for supply of product information

- Regarding the supply of the product information there are a few options:
 1. **All relevant product information** goes **with the product**, from start to end of the supply chain.
 2. **Only basic information** goes **with the product**. Additional product information is available from an (online) **repository** in which the supply chain partners publish their product information.
 3. A **supply chain partner** only provides his **output product information** to his customer. No information is shared about the input product information from previous partners, processes and batches in the supply chain.
- Options **1.** and **2.** involves a **continuous supply chain**. All supply chain partners participate and contribute to the product information set.
- It is a minor question what information has to be shared and in which granularity. Raw data throughout the supply chain, or many subsets of information to be covered by a certificate for a party, location, process product type or product batch.

What is the key information set for a supply chain partner(s)?

- A second issue in option **1.** and **2.** is the **information infrastructure**.
What, who and where for the repositories?
Which messages to upload and to retrieve information, access and autorisation issues.
- In option 3. there is **no continuous supply chain**. If a supply chain node is missing, a structure is required to recover – to bypass the missing node in order to obtain information about the upstream partners and products.
A standard solution is provided by track and trace (TT) standards and implementations such as **EPCIS** and UN/CEFACT TT plant products can be an answer to eliminate the missing node.
- This document focus on the definition of the information set related to the product information flow in the supply chain, (**Options 1 and 2**).
- The TT requirements with a broken chain (option 3) is not in scope.

Product information flow

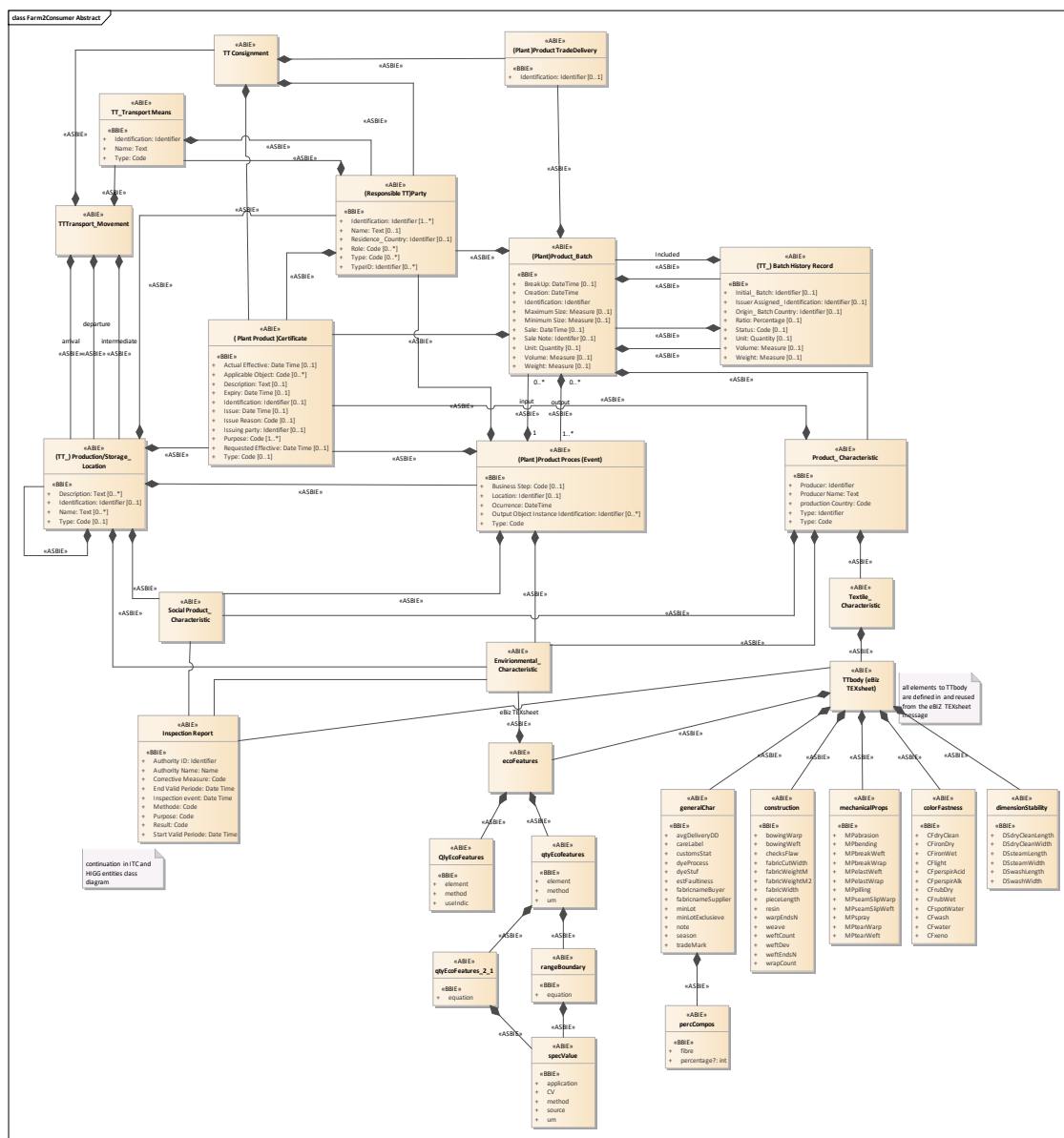
- The **product information flow** can have large differences in the information details required and exchanged.
- Providing an abstract information structure supports the different production stages in the supply chain, the different demands and limits of the parties involved.
- Differentiation of the information into the more **static entities** and the more **dynamic entities** can reduce the complexity and cost of the information exchange.
 - a. **Static entities** includes **party, location/facility, process** and **product type**.
 - b. **Dynamic entities** include **product batch** and **transport**.

Role of certification

- **Certification** can reduce the information set.
- A certificate assumes that the certified entity meets the requirements specified for the certificate.
- Hence, the detailed information set can be replaced by the specified certificate.
- In the information entity set defined in this document the detailed information and the certificate options are supported.
- Regarding the block chain pilot project, this document does not provide a direction how and where to store and exchange information. The definitions of the information entities includes identifiers and key characteristics, to support a minimal but sufficient information set on a blockchain (in fact, to support option 2).
- It depends on the use cases what will be the specification of the messages derived from the information set (class diagram)

IV. Class diagram Farm to Consumer Abstract

1. (Plant) Product Trade Delivery
2. TT consignment
3. TT Transport Means
4. TT Transport Movement
5. (Responsible TT) Party
6. Plant Product Batch
7. (Plant Product) Certificate
8. (Plant) Product Process (Event)
9. (TT) Batch History Record
10. (TT)Production/Storage Location
11. Product Characteristics
12. Textile Characteristics
13. Social Product Characteristics
14. Environmental Characteristics
15. EcoFeatures
16. Quality EcoFeatures
17. Quantity EcoFeatures
18. Range Boundary
19. Specific value
20. Inspection Report (ITC/HIGG Idexn Class Diagram)
21. TTbody (eBIZ TEXsheet) All elements to TTbody are defined in and reused from eBIZ Texshhet message
22. General Char
23. Construction
24. Mechanical Props
25. Color Fastness
26. Dimension Stability
27. Perc Composition

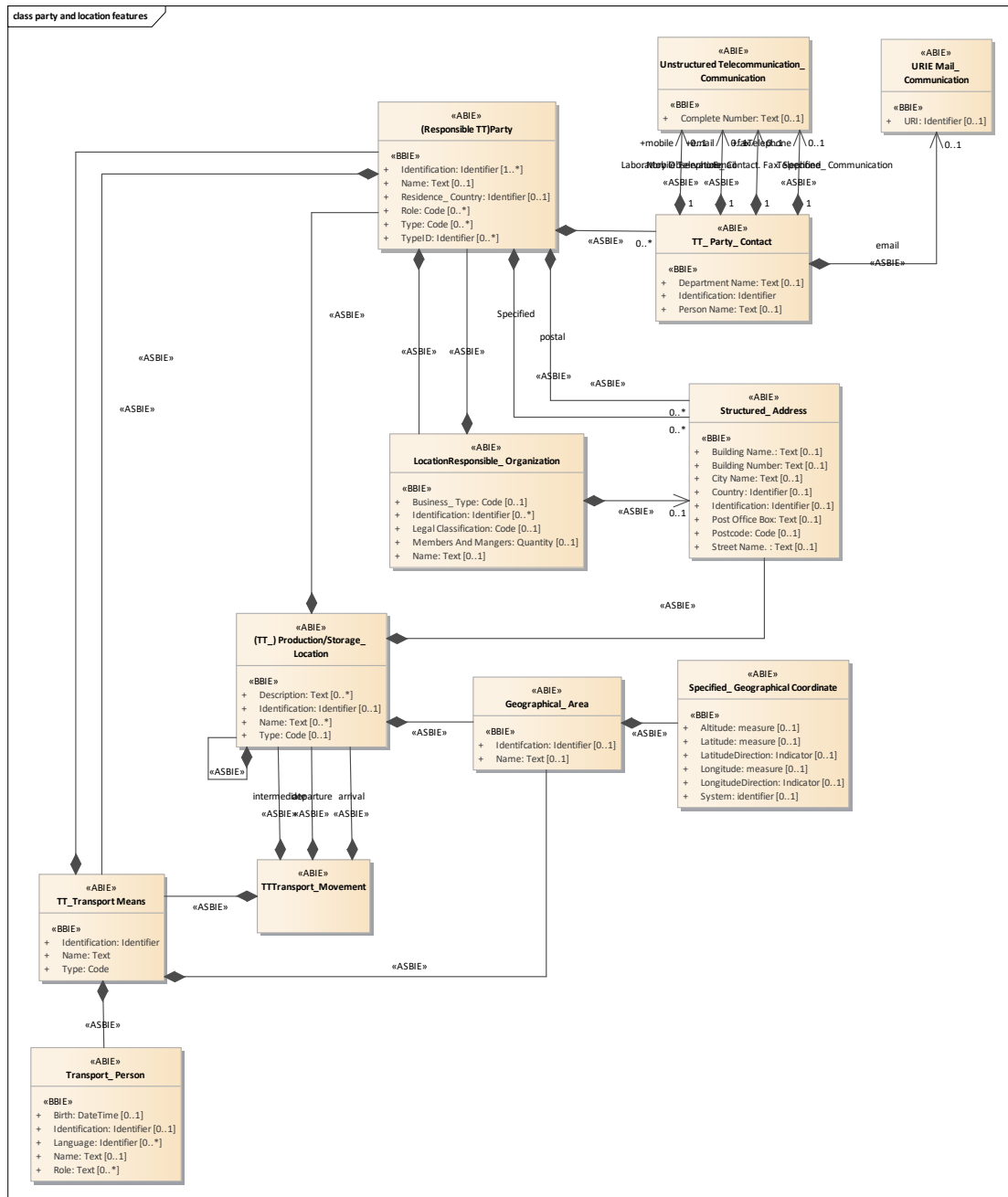


Remarks:

- The **basic structures** for **party**, **location** and **transport** are in a separate class diagrams (see below)

V. Class diagram for Party and Location Features

1. (Responsible TT) Party
2. Location Responsible Organisation
3. Structured Address
4. TT Production/Storage Location
5. TT Transport Movement
6. TT Transport Means
7. Transport Person
8. Geographical Area
9. Specified Geographical coordinate
10. Unstructured Telecommunication Communication
11. URIE Mail Communication
12. TT Party Contact

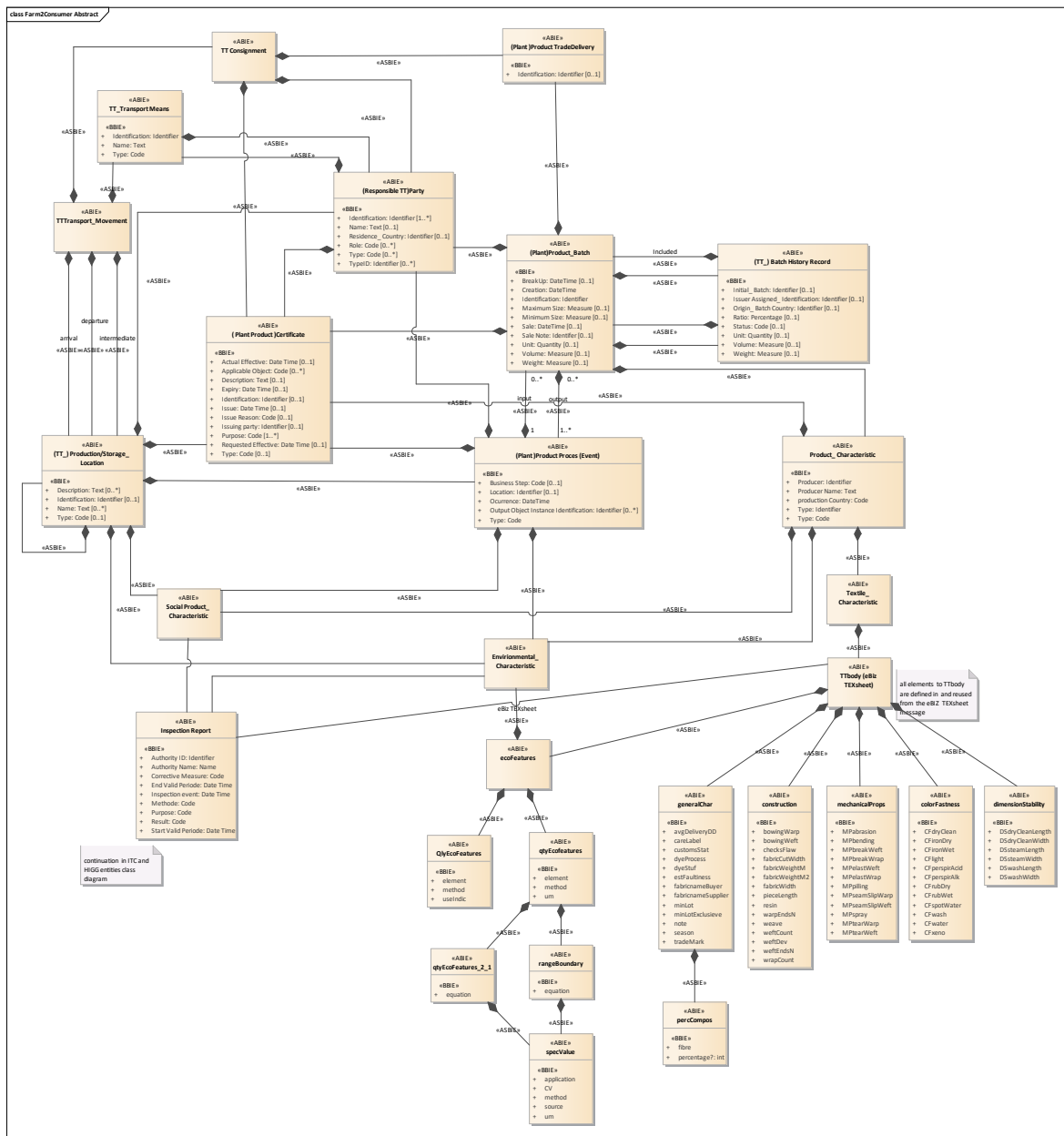


Remarks:

- The extensions to detailed information about environment, chemical and social themes are in the next class diagram. This includes also the certificates and the inspections for the certification or classification.
- All these inspection and classification can be applied to the party, the location / facility, the process and to the product type and the product batch. (see the diagram of the ITC and HIGG entities).

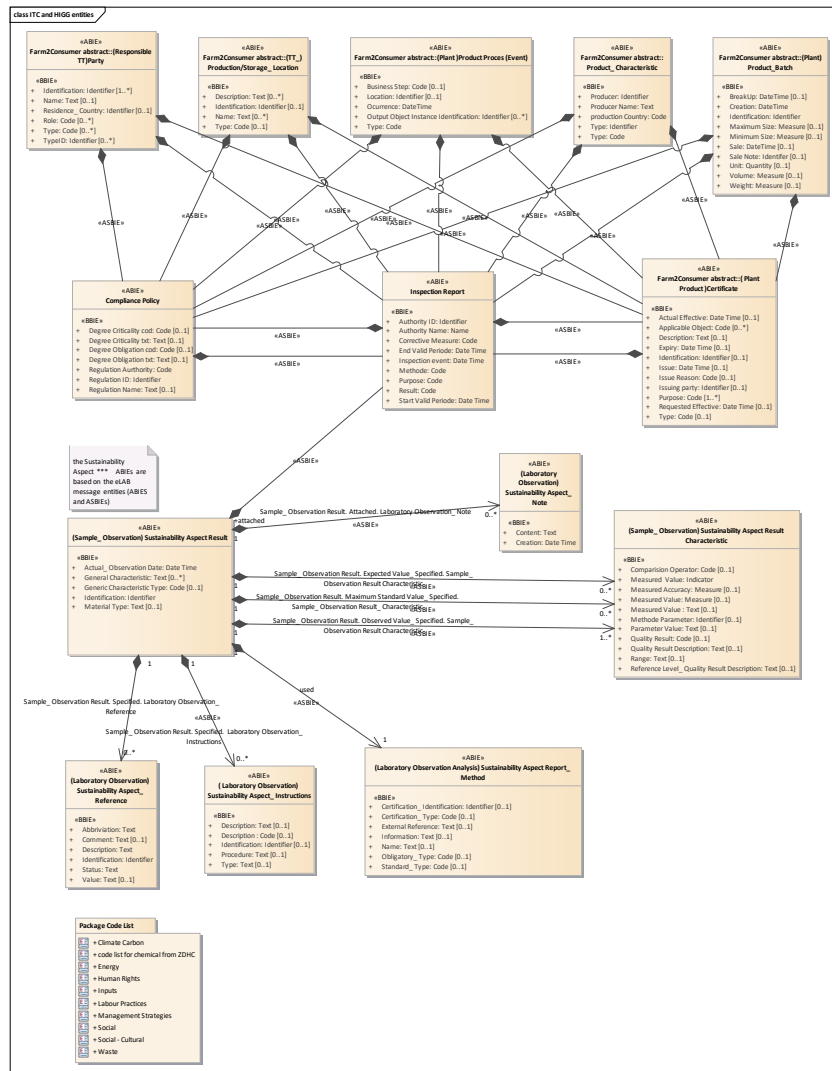
VI. Class diagram Farm to Consumer Abstract

1. (Plant) Product Trade Delivery
2. TT Consignment
3. TT Transport Movement
4. TT Transport Means
5. TT Production/Storage Location
6. TT Product Storage Location
7. Responsible (TT) Party
8. (Plant) Product Batch
9. (Plant) Product Process (Event)
10. (Plant) Product Certificate
11. Social Product Characteristics
12. Inspection Report (Continuation on ITC and HIGG entities class diagram)
13. Environmental Characteristics
14. EcoFeatures
15. QualityEcoFeatures
16. QuantityEcoFeatures
17. QuantityEcoFeatures_2_1
18. RangeBoundary
19. SpecValue
20. Product Characteristics
21. Textile Characteristics
22. Ttbody (eBiz TEXsheet) all elements of Ttbody are defined in and reused from the eBiz Texsheet message
23. GeneralCharacteristics
24. PercComposition
25. Construction
26. MechanicalProps
27. ColorFastness
28. DimensionStability



VII. Class ITC and SAC HIGG Entities

1. Farm2Consumer Abstract: Party
2. Farm2Consumer Abstract: Production/Storage_Location
3. Farm2Consumer abstract: (Plant) Product Process Event
4. Farm2Consumer abstract: Product_Characteristics
5. Farm2Consumer abstract: (Plant) Product Batch
6. Farm2Consumer abstract: (Plant Product) Certificate
7. Inspection Report
8. Compliance Policy
9. (Sample_Observation) Sustainability Aspect Result
10. (Laboratory Observation) Sustainability Aspect_Note
11. (Sample_Observation) Sustainability Aspect result Characteristic
12. (Laboratory Observation) Sustainability Aspect_Reference
13. (Laboratory Observation) Sustainability Aspect_Instructions
14. (Laboratory Observation Analysis) Sustainability Aspect Report_Method
15. Package Code List: +Climate Carbon, +Code list for chemical from ZDHC, +Energy, +Humar Rights, +Inputs, + Labour Practices, + Management Strategies, + Social, + Social -Cultural, + Waste



Remarks:

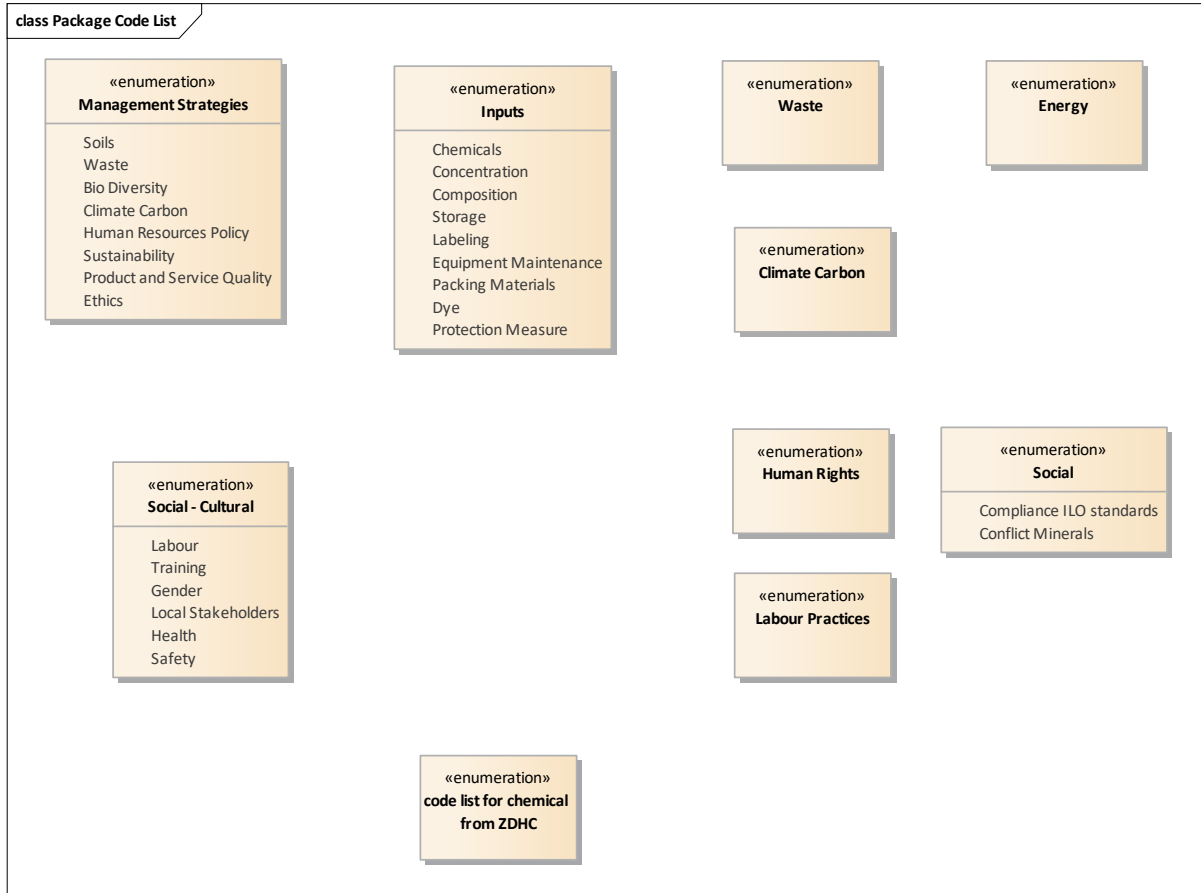
- For this detailed information about the characteristics of a party, location, facility, process and product, the structures are reused from the eLAB messages.
- For the sustainability aspects, the information can include the instruction to assess the risk/issue, the method and used procedure, the reference values, the observed values and eventually the

conclusions for the risks/issue. All depending on identifiers and code list for instruction, method and values.

- Observations can be expressed as indicators, text or measures.
- The Sustainability aspects can be defined at a high level, such as:
 - Is there a management strategy for waste water treatment? Yes – No, or at a more detailed level what is the waste water quality and quantity, with the concentrations of harmful chemicals, water temp etc.
 - Or for social and labour conditions: are there learning facilities, is there a program for labour development, up to how many persons are educated / certified this year or in this program?
- This all depends of the coding of the sustainable aspects.
- This structure relies on the usage of code lists.
- In the package for ITC and HIGG code list an indication is shown.
- The industry has to provide the appropriate code lists and values.

VIII. Class Package Code Lists

1. Management strategies
2. Inputs
3. Waste
4. Energy
5. Climate carbon (CO2 emissions)
6. Human rights
7. Social issues
8. Labour practices
9. Social cultural
10. Chemicals use (code lists ZDHC)



IX. Examples of information entities for the Cotton Value Chain

1. **Party:**
Farmer, cotton grower, cotton harvester contractor
Trader in raw cotton,
Transporter
Packing and storage operator for raw cotton
Ginner facility operator, responsible person
Ginner Company
Spinner facility operator
Trader in raw fibers
Trader in supplies (chemicals, dye, artificial fibers ,...)
2. **Location:**
Farm, farm field, crop field
On farm store,
A store from a trader, storage in a port
Packing location
Port (railway station , naval port (river, sea) , airport, road)
Facility (a location where a process is executed.
3. **Facility:**
ginnyery, twainery, weaving plant, water treatment plant,
package station
transport location
a transport equipment? (truck, train, vessel)
or a subset of a facility (production line, gateway of a storage)
4. **Transport facility:**
railway station,
airport
naval port
distribution center ?
5. **Transport means:**
truck
Train wagon, coach
Container
Vessel
Airplane
motorbike
6. **Processes:**
Planting cotton, treatment of the crop, harvest of the fibers
Packing (raw cotton) and/or repacking
Transporting
Ginning, cleaning, washing of cotton
Twining
Weaving, knitting
Coating, dyeing
Cutting
Manufacturing
Selling and buying
Inspecting, certifying
Water and air treatment
7. **Product type**
Raw organic, cotton fiber
Ginned cotton with certain specifications (fiber strength, length etc)
Yarn with specific characteristics (strength, composition, size color)
Fabric , sheet with specific characteristics, strength length pattern colors)

8. Product batch

A raw cotton bale of a set of raw cotton bales produced and harvested on a specified farm and treated as a single commodity.

Yarn batch the set of yarn spools of a dedicated yarn type, produced in a certain delimited period in specified facility and treated as a single commodity.