GermanFashion
Modeverband Deutschland e.V.

GCS
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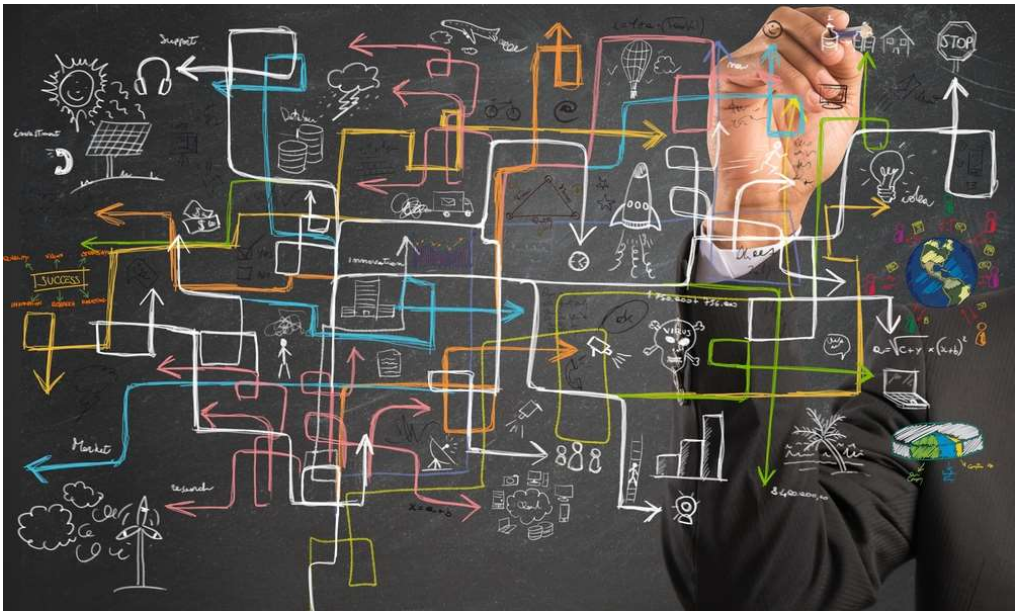

PILOT PROJECT

DATA EXCHANGE

RESULTS - LEARNINGS - RECOMMENDATIONS

BEST PRACTICE RECOMMENDATION FOR AUTOMATED EXCHANGE OF PRODUCT ATTRIBUTES AND TRANSACTION DATA FOR RAW MATERIAL, PRODUCTION MATERIALS AND FINISHED PRODUCTS IN TEXTILE END TO END VALUE CHAINS.

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About GCS Consulting GmbH

GCS Consulting GmbH is a management consultancy in Munich, Germany with an exclusive industry focus on Fashion, Sports, Luxury & Lifestyle.

In addition to the "normal Consulting services" at the GermanFashion Modeverband Deutschland e.V. fashion association we are the telephone hotline for "Processes, IT & Logistics".

Due to its members from Fashion, Corporate Fashion and Protective Wear GermanFashion Modeverband Deutschland e.V. has in Germany a major market share with all its members with a significant number of touchpoints to the market. In exchange with its members sector wide system relevant challenges became visible.

To counter these challenges, the pilot project for data exchange was launched, which is a cooperation between the GermanFashion Modeverband Deutschland e.V. and GCS Consulting GmbH. The basis of this cooperation is the focus on neutrality and innovation as well as the development of significant efficiency potential.

The results of this pilot project shown in this document were that promising that most of the participants joined forces to start in August 2020 a new, so called Global Textile Scheme Initiative. In this context there will be a new implementation organization with the name Global Textile Scheme UG managing all related activities and develop and establish a technical infrastructure (data pool/clearing center).

EXECUTIVE SUMMARY

We all know: no IT system in the world can work well without data in a good quality.

Particularly product related master data and product describing attributes create a lot of manual work in processing them and data quality headaches. This is the case because today an automated generation of the related data is not possible.

The Pilot Project Data Exchange was looking for innovative ways for the future, to reduce labor intensive manual processes and speed up delivery times by looking closer into the three following topics.

Spectral Color Communication: Virtual product development and particularly the efficient use of digital material parameters and virtual color require specific insights, many of them offered in this document as learnings, coming from the first project scope "Spectral Color Communication".

In the field of product development digitalization is currently within a paradox. On the one hand, the creation of 3D designs and communication with virtual digital color and material parameters are becoming "normal", on the other hand, it is particularly difficult for smaller companies to build up sufficient detailed know-how to be able to keep up with the existing expertise of larger companies and to meet their requirements for the new technology.

The project took care of this paradox, so we are happy to contribute with this document and help building up this expertise in fields like e.g. what is the right color measuring method or options regarding scanner technologies.

Automated Data Exchange: Sustainability, recycling, and efficient exchange of supply chain data all have in common, that we need one joint "end to end data model" plus synchronized mechanisms to pull data. Using these mechanisms, not only the pure master data but also the product-describing attributes can be additionally provided and processed automatically.
Such an end-to-end approach is also important because we are already seeing more and more legal pressure from NGOs, national legislation (e.g. supply chain law) and international legislation (e.g. recycling management directive of the EU Commission) as an industry.

This project created such a dynamic and generic end to end data model (from fibre to recycling) called Global Textile Scheme, including a classified set of standardized products describing meta data of attributes and values.

Labor-intensive data such as technical data sheets, the content of which currently has to be entered manually into your IT systems (PDM / PLM / PIM / ERP), can suddenly be exchanged from machine to machine using a concept described in more detail in Chapter 5.

The fact is, today it is almost impossible to search for clothing on the Internet according to finer criteria than assortment, color, and size. We want to achieve what is already part of everyday life in other industries by harmonizing the product-describing attributes.

Collaborative Planning & Forecasting: There is by far too much Textile/Fashion merchandize on the global markets, using resources our planet cannot replenish and supply forever.

One of the reasons for huge markdowns in most steps today's almost zero-responsive value chains (which is exactly the opposite of Consumer Driven Value Chains!) is a system immanent lack of collaboration along the value chains.

If we could create similar structures by creating strategic network structures between material suppliers and brands, we could create much more flexibility as well as better transparency and control of the supply chain.

To put it more precisely: Today we don't tell our supplier partners in a structured manner what we want, how much we want and where we want it - and at the same time we expect them to deliver quickly.

To meet the increasing consumer expectations, such variable supply chains must be developed and implemented collaboratively from the supplier to the manufacturer to the retailer.

Chapter 6 offers valuable insights into generic structures that this project was able to develop and that can be used soon. They also enable data to be exchanged from machine to machine to increase delivery speed and reduce stocks. Through this completely new way of working innovatively, we can all become more sustainable and efficient.

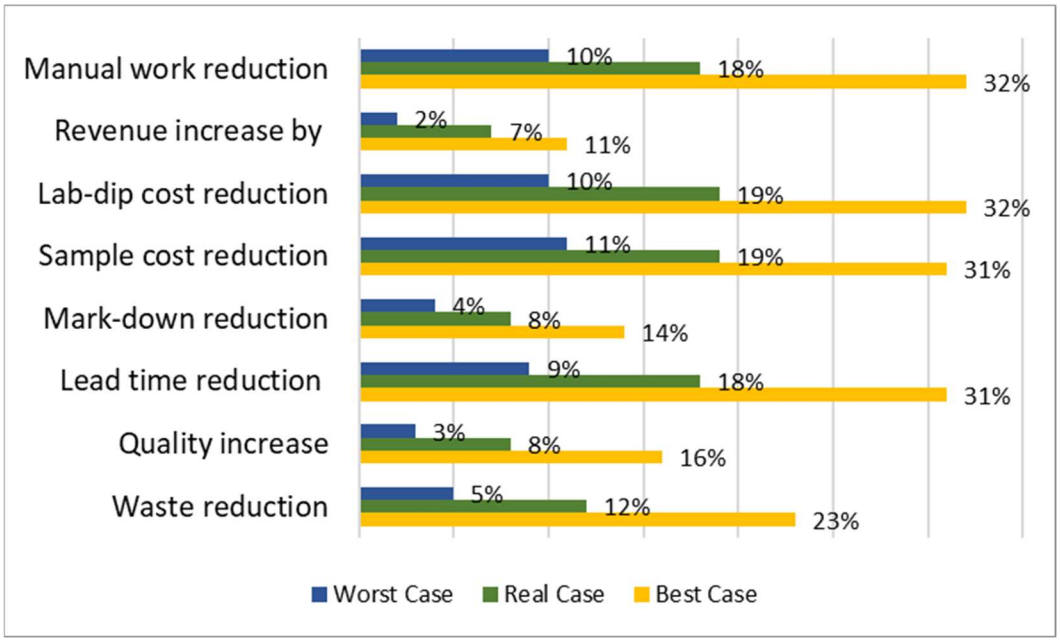
This document explicitly does not deal with IT and data Chinese.

The document describes valuable insights into how your company can become more efficient, faster = more consumer-oriented and more sustainable - and that "lean" and efficient.

This document is about saving money in times of major changes and use new ways of thinking, created by a great collaborative community to bring your company into a good future - for you, your team, and for saving resources.

If you are thinking about virtualizing your product development, reducing your administrative costs and manual work in the processing of product data, shortening the time to market and at the same time reducing price discounts and overproduction, this document will help you to recognize which improvements and processes are already possible today are. It shows you what technologies can be used, what important details you need to know, and what initiatives there are where you can learn from innovative colleagues.

A structured survey in the final meeting of the project (with 27 participants) shows the following estimated benefits of using the Global Textile Scheme and communicating with digital material parameters and colors.



Picture 1: Pilot Project Data Exchange - milestones reached, Newsletter Article from GermanFashion Modeverband Deutschland e.V, July 2020.

1 INTRODUCTION - PILOT PROJECT DATA EXCHANGE

One of the main reason for the current challenges of majorly manual data exchange within the textile value chains is the simple fact, that looking at today's textile value chains, the whole textile sector is traditionally thinking in Textile Industry, Fashion Industry and Fashion Retail, being determined by various logic and system breaks, data silos and at the end by a lot of manual work.

From a helicopter perspective in summer 2020 there do exist *3 ways to exchange product related data* between companies:

1. MASTER DATA POOLS: globally the biggest Master Data pool is so called Global Data Synchronization Network (GDSN-close to GS1), with globally approx. 40 synchronized Data Pools – today mainly used by the food industry and for various reasons rather challenging to use for fashion companies

   The GDSN data model and the structure of the content are relatively firmly connected, both very much downstream (finished products) oriented. As a result, each additional data element result in the need to adapt the data model. A rather huge adaption to many additional upstream data elements like e.g. product describing attributes is not seen as an option by most experts.

2. EDIFACT – well known and extensively in use in fashion – is currently in use very much "order processes oriented" and the receiver must wait for the sender to receive the data – getting increasingly difficult with the growing demands from consumers in terms of transparency and speed.

3. PLATFORMS: Considering that point 1 and 2 are suboptimal, more and more platforms enter the market offering solutions mostly for one singular problem or field – creating additional costs as well as increased complexities due to interfaces requirements.

What is missing is an end to end joint data model or scheme with business rules and innovative, technologies serving the latest needs.

This is the reason, why in spring 2019 a handful of pioneer market players joined forces and initiated the so-called Pilot Project Data Exchange with 3 project scopes:

1) Improve the environment for digital (spectral) color communication, which has been expanded rather quick to a scope of communicating with digital material parameters. Because GCS Consulting GmbH saw the benefits behind the idea of a cloud solution to exchange virtual color values we supported Color Digital GmbH from their early start period. First Quarter 2019 there was quite a bit skepticism and "solid half-knowledge" in the market. Regarding the so called DMIx platform for data exchange by Color Digital in Cologne, Germany critical mass was yet missing, so the project intended to support Color Digital to improve the DMIx-

knowledge in the market, evaluate answers for quite a few open questions and purely help them in their startup phase - for the benefit of the textile sector.
It turned out, that there were much more open topics as we had anticipated, so it payed to look for more details and learning the details further down in this document.

2) The second scope was the wish to find a way to automate the exchange of product master data and product describing attributes in an easy and inexpensive way and beyond order processes, currently the main field of data exchange.
The vision behind this project part was gaining the data like online pulling a bank statement today. The goal was to evaluate a **"4th new way"** beyond Master Data Pools, EDI and Platforms, particularly serving and matching the needs of the many small and smallest but valuable market participants making the textile sector so unique – being very limited on resources of all kind.

3) Globally there is way too much merchandise on the markets, because "Consumer Driven Value Chains" do not exist in most companies and business models. The current lead times are way too long to be really "consumer driven" and one of the main reasons is the almost total lack of cross sector collaboration – both in planning and in forecasting.
A 2018 SCM Benchmark by GermanFashion Modeverband/GCS Consulting GmbH showed clearly that most Fashion Industry players do not tell their material suppliers beyond risk disposition/material blocks anything about their demand developments.
But then they expect fast delivery, which for sure did not work in the past and will not work, if we don't change as an industry the rules!
This was the reason why the third scope of the project, called "Collaborative Planning and Forecasting" was evaluated closer within the project.

The following picture shows for all three project scopes an executive view of the problem- and solution-description at the beginning of the project and each of the three individual goals:

	Virtual Product Development	Collaborative planning & forecasting	Master Data Automation
Problem	When communicating colour: - Too many failed attempts at Lab Dips - High manual workload - High costs - Time consuming & inefficient (lead time)	Current Lead Times: - Way too long - Material delivery takes too long - Supply chains are too inflexible - Sole price focus towards suppliers - At the same time high mark downs	When creating product descriptions B2B / B2C: - Zero automation - High manual work load - High cost / time consuming / error prone - Structured data and basic technology is missing
Solution	Cloud application (DMIx): - Digital instead of analogue - Data instead of physical samples - Exact spectral value instead of reference to colour systems (e.g. Pantone) - Virtual Showrooms (supplier) - Virtual workspaces (customer)	Collaborative planning and forecast: - Collaboration as a new basis - Development of simple & inexpensive best practice recommen-dation with defined structures & rules based on GUSI (The Global Upstream Initiative) by Consumer Good Forum	Master Data & Technology: - Gathering + harmonization of all relevant master data as a basis for automation - Evaluation of new real-time technology
Goal	Reduction of manual processes: - Less lab dips due to better hit rate - About 30% less sample costs - 22% lead time improvement - Creating a technical basis for virtual product development	Reduction of lead time + costs: - Reduce discounted sales through more flexible supply chains - Faster material availability - Create basis for "Consumer driven value chains "	Reduction of manual processes: - Automation of data generation - Automated creation of product descriptions - Retrieval of certificates, such as bank statements

Picture 2: Executive project overview, GCS Consulting GmbH, Munich 2019

The intended project time frame was from 1st of May 2019 to 30th of September 2020. The founding members in 2019 were the following companies (in alphabetical order):

- Color Digital GmbH, Cologne
- Création Gross GmbH & Co. KG
- GCS Consulting GmbH
- GermanFashion Modeverband Deutschland e.V.
- Olymp Bezner KG
- Peter Büdel GmbH
- Roy Robson Fashion GmbH & Co. KG

When the group started there was nothing but a handful of ideas and a vision to create new and innovative ways of data exchange by using as much as possible of already existing ideas/tools and to avoid double work.

Despite quite some Covid-19 related turbulences the project ended successfully end of July 2020 plus with many more results as we had ever expected.

1.1 PARTICIPATING COMPANIES WITH CONTACT PERSONS

The following companies took part in the data exchange pilot project.

If you have any questions, please speak to the specified contact person in the company who has expressly agreed to this.

Brands:

- Ahlers Group – Mr. Wolfgang Weber
- Création Gross GmbH & Co. KG – Mr. Tobias Schuhmacher
- Digel AG – Mr. Meinhard Iken
- Hugo Boss AG – Mr. Tobias Kalthoff
- JAKO AG – Mr. Markus Frank
- Marc Cain GmbH – Mrs. Claudia Diegner
- Olymp Bezner KG – Mr. Thomas Graupner
- Roy Robson Fashion GmbH & Co. KG – Mr. Thomas Drexler
- Schöffel Sportbekleidung GmbH – Mr. Georg Kaiser

Production material:

- Alterfil Nähfaden GmbH – Mr. Gospert Amrhein
- Amann & Soehne GmbH & Co. KG – Mr. Christian Scholz
- Chargeurs PCC – Mr. Thomas Vogel
- CK Kreativ Knopf GmbH – Mr. Marcel Morthorst
- Cortec GmbH – Mr. Torsten Schmitt
- Devetex GmbH – Mr. René Frank
- Franz Schäfer Etiketten GmbH – Dr. Thomas Born
- Freudenberg Performance Materials Apparel SE & Co. KG – Mr. Klaus Baader
- Knopf-Schäfer GmbH – Mr. Oliver Harrer
- Kufner Holding GmbH – Mr. Ulrich Sogl
- Peter Buedel GmbH – Mr. Christian Büdel
- Ploucquet GmbH – Mr. Christian Reinsch
- SML (Central Europe) GmbH – Mrs. Barbara Mattis

IT providers:

- Betafashion GmbH – Mr. Stefan Voß
- BE-terna GmbH – Mr. Rico Hänel
- Color Digital GmbH – Mr. Kai Timpe

- Impuls AG – Mr. Axel Domschke
- INTEX EDV-Software GmbH – Mr. Stefan Ruschel
- Pranke GmbH – Mr. Daniel Gleichauf
- Schaeffer Productique S.A.S – Mr. Rémy Wolfer
- sedApta concept GmbH – Mr. Olaf Jaensch
- SMF/Dedagroup (Stealth) – Mr. Fabrizio Paltrinieri
- SyncForce BV – Mr. Hans de Gier
- sys-pro GmbH – Mr. Peer Hohn

Associations & Consultants

- ENEA – Mr. Piero de Sabbata
- GCS Consulting GmbH – Mr. Andreas Schneider
- GermanFashion Modeverband Deutschland e.V. – Mr. Thomas Ballweg
- GS1 Germany GmbH – Mr. Andree Berg

1.2 Overview

This is an open Best Practice Recommendation sharing the group's Results, Learnings and Recommendations" and not a classical, "mechanical – do this, don't do that" guideline.

The project group developed the findings in this document in an intentionally agile way and quite often with "one thing leads to another" approach. Many findings are still in a conceptional phase but an impact on our industries is already foreseeable.

Therefore, most topics and learnings presented in this document cover so many innovative facets of the group's learnings, that all those insights would be lost, if we had concentrated on the sole content and presented it as a mechanical guideline.

Many such "pure guidelines" never find their way to praxis, as the learnings behind them have been cut out.

That is why we wrote this Best Practice Recommendation intentionally a bit more describing and marked important learnings and/or recommendations within the text by highlighting them as "learnings"

1.3 Who developed this document?

This document was written by GCS Consulting GmbH on explicit request of the members to give companies outside the latest member base a chance to learn from our work and project results and to make the

reader literate enough to decide on the base of significant findings in 3 important areas, what to use for the own company and what not.

The "Learnings and Recommendations" in this document were developed by 89 professionals from 37 companies who worked 15 months in 4 virtual Workgroups and 4 physical meetings on breaking traditions and behavior borders for a better and sector wide way of doing business, preparing Textile and Apparel/Footwear Industries and Fashion retail for significant changes at the horizon.

The companies and their professionals came from the following sectors and countries:

- IT – Germany, Italy and France
- Production material Industry (Function) (France, Germany)
- Brand (Function) (Germany)
- Associations (Germany)
- Institutes (Italy)

1.4 WHY THIS DOCUMENT?

We practice digitalization already for the last 30 years.

Nevertheless, the speed of change has significantly increased, and todays goals are to manage complexity as reducing complexities is not enough anymore.

To cope with complexity, we must practice interdisciplinary learning from and with one another. Participation in the (later described in more details) Global Textile Scheme Initiative enables this type of learning. The additional knowledge acquired from managers, specialists and executives can be viewed as a gain.

This document shall help to find additional companies to join the Global Textile Initiative, which is a group of early movers implementing the learnings from this project and proactively drive the transition from learning to implementation, to use potentials for:

- Less time to market,
- More virtual product development
- One end to end, global, multilingual and machine readable "Textile & Fashion Language" to practice the exchange of Business information more professionally and efficient.

Such a joint language can only fulfil its purpose when in our case many companies from all sectors start using this "language".

This requires other players from the textile value chains to know the results and the background including the specific experiences which determined the results.

This document shall deliver and communicate all relevant insights.

Today the Global Textile Language (developed in this project) is a core element of the Global Textile Scheme, that is currently only 25% finished and will need in the future additional work, maintenance efforts and an operational and technical infrastructure which will require sufficient funding.

As "low costs" is the last but very important point on the members' objective list, the implementation activities after the project will be set up as an initiative, similar like the group in this pilot project.

A German rhyme says: "Many hands – small ends" so the more players use the results of this project, the better the upcoming infrastructure costs can be shared and the more attractive is the new "data exchange world" pricing, particular for the many SME's enriching our value chains.

This document can therefore help small and medium-sized companies to get involved early in the topics described and this way to successfully align internal company developments and processes with the future. Those who have no idea what the future might look like cannot shape their corporate strategy successfully.

Another reason for this document is the fact that this short project touched in most areas totally new territories resulting in unexpected insights that we expect to have a real value in the expected turmoil after the whole global textile sector will need to stretch and change in difficult "post Corona"- market environments.

1.5 SCOPE

Regarding data this document addresses automated and therefore more efficient data exchange, faster, with less manual work and better data quality for the following data groups:

- *Color data* with spectral values.
- *Material parameters* with all elements needed for virtual product development.
- Data exchanging of *participant master data* with multiple company identifiers and end to end capable privacy functions based on the True Code pilot by the Consumer goods Forum.
- *Generic product master data*, also with multiple options of standardized and currently not standardized product identifiers.
- Nonregulated and regulated *product features*.
- *Confidential trade data*.
- *Documents,* like e.g. certificates of all kind, EUR1, Supplier declarations, etc.
- *Selected Transaction data* like e.g. transaction certificate data and standardized demand data.

Please note, that above list represents the status in July 2020 and shows the scope and intermediate results of a project, that as the name "pilot project" says, was never intended to deliver so many and usable results – with all the way left to go.

1.6 AUDIENCE

This document is designed to be used from participants from the following sectors/functions of textile value chains:

- Raw material producers, like e.g. farmers, etc.
- Production material producers, like e.g. producers of yarn, leather, fabric, buttons etc.
- Manufacturers, both CMT and Full package manufacturer,
- Producers/Brands working with CMT and/or Full package manufacturers,
- B2B and B2C Fashion Retailers, particular vertical retailers.

1.7 DEFINITION OF TERMS (IN LOGICAL ORDER)

- Raw material function: the role or function in the value chain producing raw materials like e.g. wool, cotton, polyester.
- Production material function: the role or function in the value chain producing production materials like e.g. yarn, fabric, button, zipper etc.
- Manufacturing function: the role or function in the value chain really manufacturing a product of all kind and all functions.
- Production/brand function: the role or function in the value chain designing and distribution the product. For clarification: vertical retailers have the brand and the retail function.
- Retail function: the role or function in the value chain selling the product to consumers in brick and mortar stores and/or online. For clarification: retailers with private label products have the brand and the retail function.
- Downstream: the value chain part from that brand to the retailer (B2B) or consumer (B2C).
- Upstream: the value chain part from that raw material to the brand.
- Global Textile Scheme Initiative: a sector crossing Textile Industry Initiative, initiated by GCS Consulting GmbH, as an organizational frame for evaluating innovative solutions for cross sectoral challenges like e.g. sustainability and circular economy.
  All activities and solutions are always correlated to their effects on data and (when needed) will be integrated into the Global Textile Scheme.
- Global Textile Scheme: the organizational frame, consisting out of the 3 elements:
  - Global Textile Language (GTL),
  - GTS-Cat and the
  - GTS Data Model.
- Global Textile Language (GTL): a standardized and coded multilingual attribute list of classes, features and (feature) values.

- GTS-Cat: a Cloud-based technical infrastructure with data pool and clearing center functionalities, matching the needs of the Global Textile Scheme.
- GTS Data Model: the list of data categories exchanged on GTS-Cat (e.g. GTL attributes, trade data, demand data,...).
- UUID: A universally unique identifier (UUID) is a 128-bit number used to identify information in computer systems. When generated according to the standard methods, UUIDs are for practical purposes unique. Their uniqueness does not depend on a central registration authority or coordination between the parties generating them, unlike most other numbering schemes. While the probability that a UUID will be duplicated is not zero, it is close enough to zero to be negligible (Source: https://en.wikipedia.org/wiki/Universally_unique_identifier).
- Consumer Goods Forum: a global initiative and organization founded by CEO's from major consumer good companies, who made the topic "data" a "CEO topic".
- GS1: A global standardization organization, developing and maintaining important consumer goods standards with headquarter in the USA.
- ETIM: an international classification standard for technical products managed by ETIM International (Source: https://www.etim-international.com/).
- Master data: Master Data represents "data about the business entities that provide context for business transactions". Master data is, by its nature, almost always non-transactional in nature. (Source: https://en.wikipedia.org/wiki/Master_data)
- Features: in this context features are product describing attributes.
- DMIx: a cloud-based solution by Color Digital GmbH in Cologne, Germany to exchange spectral color values and digital material parameters between vendors and buyers.
- PaX: a cloud-based marketplace by Color Digital GmbH with material parameters as search criteria possibly based on GTS.

2 THE PILOT PROJECT DATA EXCHANGE HISTORY AND ACTIVITY STRINGS IN A NUTSHELL

We give you in this chapter intentionally an overview what happened and how it happened, because this was by definition an agile project and all the surprising twist, turns and findings and the correlated experiences were a major part of all participants valuable learnings what digitization means - being one of the core project results.

The global Textile and Fashion sectors traditionally use much more resources as our planet can reproduce and stands in July 2020 in the final period of the Covid-19 crisis in front of foreseeable, earthquake like changes in practically all facets of our industry.

We started this project with 6 visionary and rather small companies, because a group of experts in a previous, international cross textile sector conference hosted by GCS Consulting had demanded with a global approach:

1. More speed to market by more virtualization in product development,
2. More efficiency in exchanging data along all steps of the textile value chains (end to end) by more automization and
3. To reduce markdowns and unnecessary overproduction and waste of resources by finally planning and forecasting seaming less between all actors in the textile value chains.

Very few major innovations of the last 15 years were disruptive by design.

Most of such innovations took existing elements and arranged them into new orders and use cases – becoming an innovation when the result of doing so found the acceptance of the markets.

When we started the project, we had no more than vague ideas about 3 areas, as described before, we wanted to improve:

1. In project scope 1, with the title "Spectral color communication" we mostly wanted to support a prosperous start up in Cologne, who had already quite some success, helping them to gain more market attention, while they were finetuning their platform for exchange of color values.
   On this way we clarified quite a few important detail questions around the technology involved and developed a joint understanding, e.g. what the right measuring method is – more details you find further down in this document.
   During the project they extended their product range by a new service called "PaX", an innovative market place to find all kind of production materials (fabrics, zipper, sewing thread, etc.) by color and by a defined set of product describing attributes, that project scope 2 turned out to develop with the Global Textile (meta data) Scheme - GTS.
   Surprisingly right this moment in July 2020 PaX turns out to be globally the first real use case for the Global Textile Scheme.

2. In project scope 2 "Master Data Automation", all we had in the beginning was the following two visions:
   a. From a technical Director of a Corporate Fashion company, who wanted to get all his Supply Chain data from his business partners online like "he pulls his bank statements today" and
   b. From an IT Manager from a famous Brand, who asked in an expert interview regarding data exchange along the whole textile value chain for "a technology beyond order processes, inexpensive and as easy as writing an email".

Very fast it was clear, that one major core element and success factor of the "new textile data exchange world" would be the necessity to "pull data", because even our own consumer behaviors are determined by impatience and by approaches like e.g. "I want to know it know".
One thing led to another so in a next step we found out, that if you want to pull data, you need to describe exactly what date you want to pull.
So one need is to define the data (the term itself and the semantics = what the term means) and if one wants to do this in multiple languages (which is critical!), one needs to encode each data.

At this point we investigated other industries and found a so called ETIM catalogue system, working exactly by principles like we needed them. As ETIM is an open standard, we extended it to our needs and developed a new meta data scheme, first with product describing attributes for Production Materials and Apparel Finished Products.

In March 2020 to our surprise GS1 US published a well recommended, so called "Raw Material Guideline" which contained valuable information, that allowed us to extend our catalogue by product class related attributes for Raw Materials and at this point we called the whole system Global Textile Scheme – GTS, which contains a system for textile meta data with currently 138 product classes, each determined by uniquely coded and standardized features and values.
Additionally, we defined a dynamic and generic GTS data layer model and extended the scope for automized data exchange gradually to Trade Data, Documents and Selected Transaction data like e.g. demand data.
In July 2020 Global Textile Language (GTL) contains product classes within the product groups

a. Raw Material (e.g. Wool, Cotton, Polyester)
b. Production Material (e.g. Yarn, Fabric, Buttons)
c. Finished Products – Apparel
d. Finished Products – Footwear

Why is this important?

Because with the GTS system as an end to end scheme we can cover in the future the textile value chain from Wool to Recycling and because it is a dynamic scheme which works in all sectors, it offers the historic chance to integrate step by step all data categories our industries needs to automate e.g. the exchange of Sustainability- and CSR-critical data between companies including ones like e.g. water consumption, CO_2 footprint, diesel consumption and/or data which are relevant for recycling, the next big challenge our industry is facing.

Technology: From the very beginning we kept our new work intentionally technology agnostic, meaning that we do not want to depend on any technology to avoid unwanted side effects and monopolies.
Technology is important though and the idea of pulling the way we wanted it was new.
So we had a deeper look into so called "Data Ports", a new basis technology promoted by the Consumer Goods Forum, intended particularly to pull data and PaX, the new market place technology by Color Digital in Cologne, our project partner in the project part Spectral Color Communication.

Due to funding restrictions that project needed to end rather abruptly in July 2020, but will continue in the second half of 2020 with the establishment of a web-based Data Pool and Clearing Center service, a neutral Organization collaborating with GermanFashion Modeverband e.V., hosting interdisciplinary work groups like e.g. a Collaborative Planning and Forecasting workgroup continuing the work described in the next paragraph.

Content is key, so in July 2020 25% of the 138 GTS product classes are that much filled with features, values, and individual codes, that they can be used.

PaX is working on being soon in its data structure GTS ready and will be most likely the first application that allows a Proof of Concept with real content – in the beginning for buttons and fabrics. Today such data are solely sent as Excel based PDF files and can be pulled from the GTS-Cat data pool when needed (planned) in the beginning of 2021.

3. The third project scope we wanted to improve, was the area of collaboration.
   One look at Wikipedia for the term "Collaborative Planning and Forecasting" shows information and last updates on this topic from the year 2000.
   This describes quite well the challenges we are currently facing – everybody knows and likes the idea, but nobody does it in the sense of the terms.
   Today the fashion sector thinks traditionally and in silos: Textile Industry - Apparel Industry - Fashion Retail.
   This results in various logic and system breaks and even worse in the fact that the demand side (brand) does not tell its vendor (production material function) what and how much of a SKU/item is wanted, where it is wanted and when – but then expects quick delivery.
   The project showed that this is pure end to end nonsense and that the consumer not only does not care but will not accept this in the future.
   The work of the Collaborative Planning and Forecasting brought two surprising results:
   a) The Material Requirement Planning (MRP) function which practically all modern ERP systems offer, produce output data in a practically identical data structure. All material vendors expressed their interest to gain access to this data which do exist but not get used at all!

b) The technical support and methodology of forecasting vary between most companies significantly – for many company internal reasons that do not matter here. In most cases the outcome will be documented in some kind of "stock order" because nobody wants to manage manually the forecasted differences to the demand coming from NOS- or Seasonal orders. This way they become a part of the results of the Material Resource Planning output.

Both findings result in the surprising facts, that if the demand data, resulting from MRP would be enriched by only 2 important facets (nomination type and demand location) and shared,

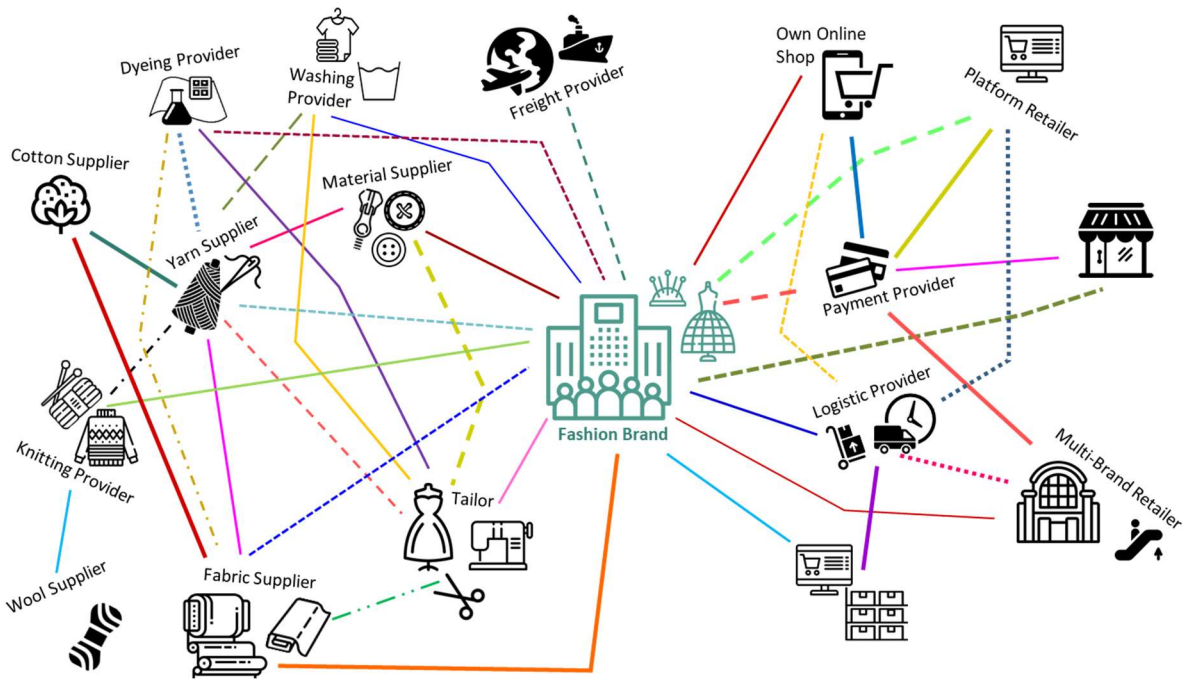
- The vendors could deliver better as today with less stock = capital costs and
- the brands could significantly improve their time to market speed and reduce markdowns and overproduction.

This knowledge then led to the fact that in the Global Textile Scheme Initiative this area becomes the basis that suppliers can obtain valuable data for efficient planning processes when they need it and are therefore happy to join the initiative.

3 End to end value chains in the Textile Sector

The textile sector is a sector with a high degree of creativity, often short product lifecycles and international value chains.

A typical network of an end to end value chain looks like the following picture:



Picture 3: Overview of a typical textile value chain, GCS Consulting GmbH, Munich 2019

When consumers wish for "consumer driven value chains" and legislators demand more transparency and higher recycling rates, it first needs structures to be able to really look end to end on such a "chaotic" value chain network with currently many logic and system breaks.

Textile value chains start with natural, often farmed and manmade fibers (non-recycled, pre-consumer or post-consumer recycled) and are transformed in the next production steps into products with very short life cycles, international supply chains, many rather small material producers and manufacturers and brands or vertical retailers managing the supply and demand side (upstream and downstream).

At the end of the value chain there is a typical consumer, who's annual spending is decreasing, while the merchandise volumes are increasing.

As a result, the price per item is going down and market growth can only come from increasing volumes of consumed items - which is not sustainable at all.

On top of all these challenging facets, less than 1% of fashion products in Europe get recycled, which needs to change as soon as possible as global resources are limited.

It is clear to professionals and an increasing amount of consumers, that this way of using limited natural resources, e.g. water will not be the future of our industry and contains on top many not value creating processes that need to be eliminated.

The following documents shows how this can work by (best) avoiding processes and/or automate processes.

3.1 WHY THINKING IN END TO END VALUE CHAINS MAKES A DIFFERENCE ?

The internet brought new technologies and innovative business models with higher value chain transparency and created increased consumer demand like e.g. the wish for same day delivery, unthinkable 10 years ago. Consumers do not care why things do not work and honestly, they shouldn't. Each time has its trends – mostly driven by consumer wishes.

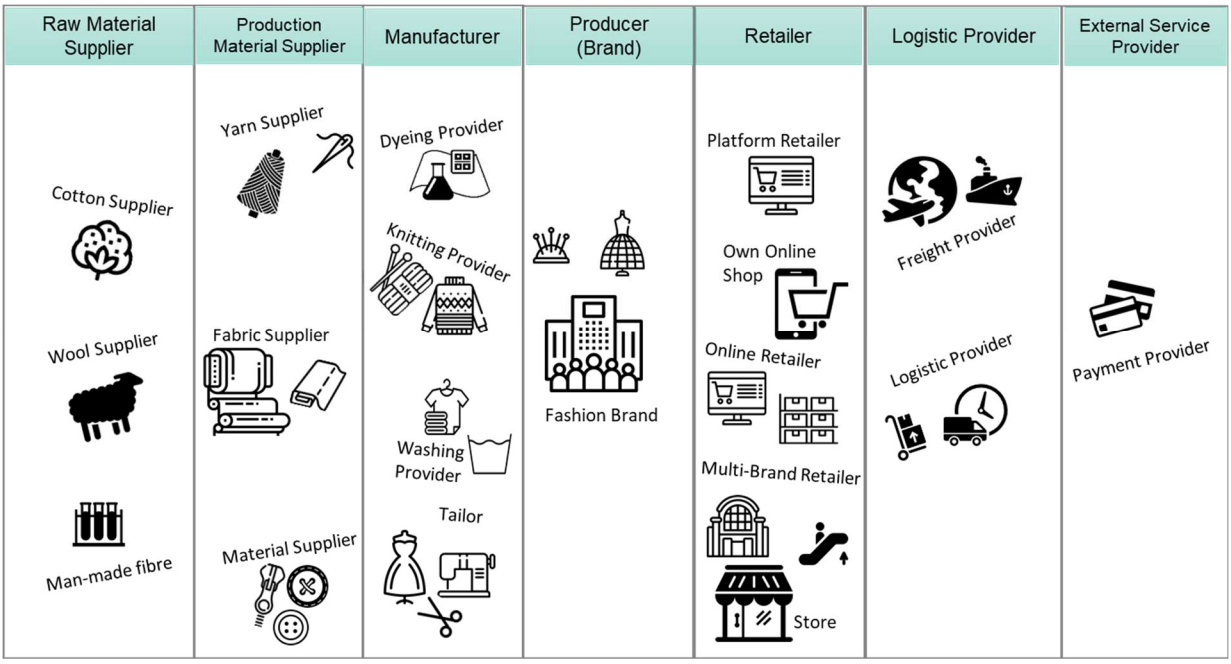
10 years ago, vendor managed inventory and intense partnerships between Fashion Brands and Fashion Retailers were the main gamechanger, mainly by implementing clear rules, data exchange (e.g. SLSRPT – EDIFACT message) and collaborative ways of doing business.

Today latest consumer demands can only be fulfilled with a holistic view on value chains from the very beginning (wool, cotton, etc.) to the end (recycling), because only such a view allows to identify and eliminate logic and system breaks, which represent today burdens between the consumer demand and the value chains' capabilities.

3.2 WHY THINKING IN FUNCTIONS/ROLES?

One of such challenges is the fact, that considering the value chain from Wool to the Point of Sale each vending party fulfilling its part and role and by doing so is a "supplier" to the related buyer.

As more and more brands install their own retail businesses and not only vertical retailers started the creation of their own sourced brands, it needs a new way of describing each players role within textile supply chains which we call "function", because we believe that the related processes can be easier associated in the semantic meaning of the term with a function than with the term "role". The following picture 2 shows the value chain functions, which the members of the pilot project agreed on and used where needed:



Picture 4: Defined overview of functions in textile value chains, GCS Consulting GmbH, Munich 2019

3.3 WHY "PULLING DATA" MAKES A DIFFERENCE?

A holistic end to end view is not enough, though.

Current Consumer demands include the wish to buy trends that last shorter and shorter. But an increasing degree of consumer also wishes for sustainable value chains which includes, that we don't produce more products as the markets can really use.

Considering the extreme complex and international value chains in our industry, it will not be sufficient to wait for third parties, until they send you the information needed for the necessary transparency. Just one example: image a button producer who wants to make his production and purchasing planning

let us say in 3 days. To do this the best way this button supplier will need in 3 days on the press of a button the demand from as many clients/brands a possible all at that one moment, when he wants to do his planning.

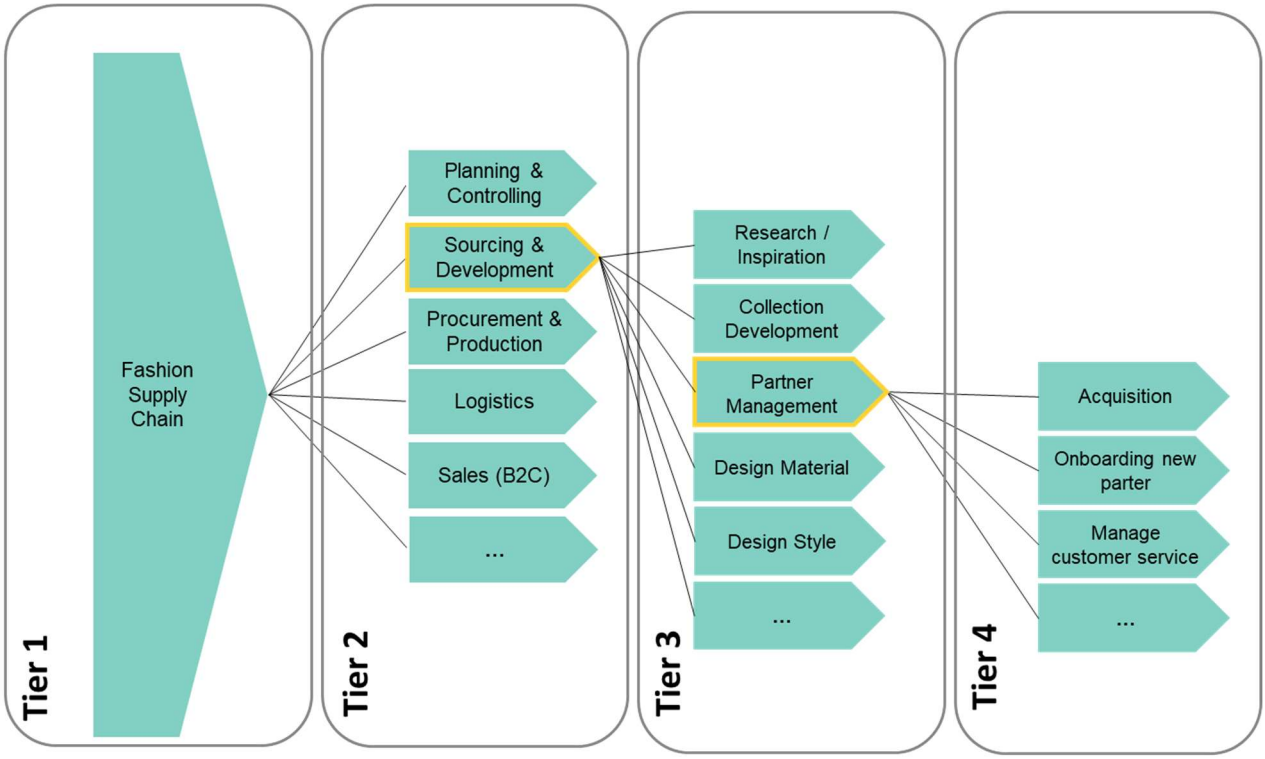
This will only work with mechanisms, data models and technology allowing to pull data and is the first radical move away from traditional working habits like we know it the last 30 years.

Again: the consumer does not care!

3.4 THE GCS CONSULTING PROCESS MODEL

On the way to this pilot project GCS Consulting prepared for a conference with experts in Frankfurt in Autumn 2018 a list with Tier 1 to Tier 4 processes, using the normal procedures of Business Process Management (going from broad to fine).

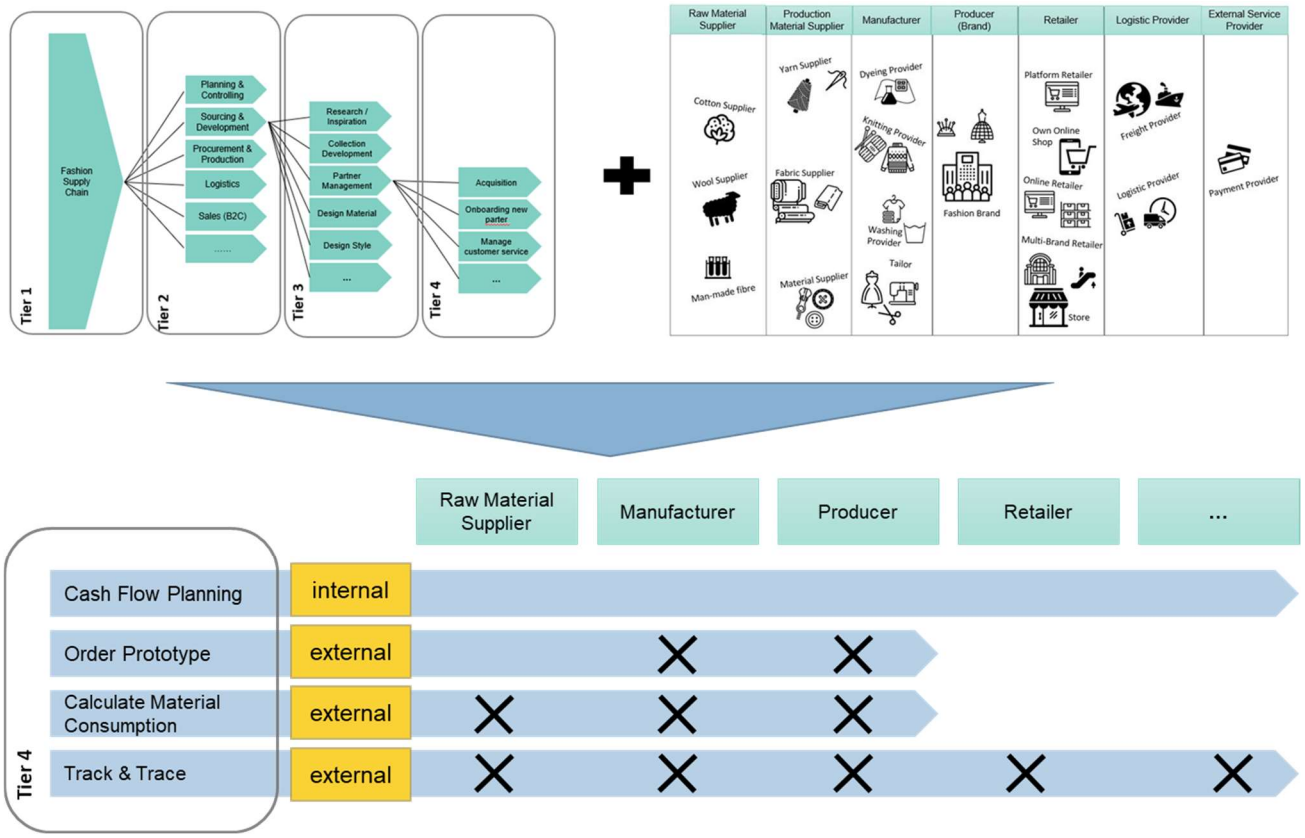
The following picture shows the logic behind this work:



Picture 5: Defined overview of Process levels and detailed processes in textile value chains, GCS Consulting GmbH, Munich 2019

Next to defining the functions this was the second approach to structure textile end to end value chains.

When GCS Consulting in a next step combined the views of the functions with the view of the T 1 to T4 logic, a surprising picture showed up:



Picture 6: Defined overview of process levels and detailed processes in textile value chains, GCS Consulting GmbH, Munich 2019

Quite a few processes repeat along the value chain, e.g. the process: handling incoming goods.

Due to the reasons mentioned before, textile value chains have the reputation to be very chaotic and hard to determine.

Most important prerequisites for any standardization are 1) a clear understanding and a precise definition of the players (in this case functions), to be able to describe "who is doing what" and 2) to define a joint language, which means a clear set of terms with defined semantics (meaning of the term).

Both prerequisites were clear when we started.

The Pilot Project Data Exchange had from the beginning a firm and defined short runtime.

Therefore, a joint understanding of functions and processes among a group of participants that gradually grew and did not know each other was critical for any success.

Learning: The view on the value chain as described in the previous picture was the first structure, that we could identify. As structure gives security, this way to look at end to end value chains in processes and

function with the shown correlation was a first step to build a solid base for joint understanding, orientation and as a result for mutual trust.

Using this tool, we were capable to identify with the members the critical processes within the 3 project scopes - which we did in the kickoff meeting.

In a second step we collected the data around the defined process and suddenly had excellent material to identify structures in the collected data, which were based on the defined core processes.

This was important for an efficient project and to build up trust within the participants as a group.

4 DIGITAL MATERIAL PARAMETER COMMUNICATION

4.1 INTRODUCTION

We started the project with the project part "Spectral Color Communication", because there was a new platform (DMIx by Color Digital in Cologne) on the market with then a lot of hesitance, half knowledge and open questions in the market and a subtle dispute "which color measuring method" (8° diffuse or 45°) measuring was "the right one".

Another open question was how to migrate from today's mostly production-oriented color measuring to such product development methods, having a 100% virtual product in focus.

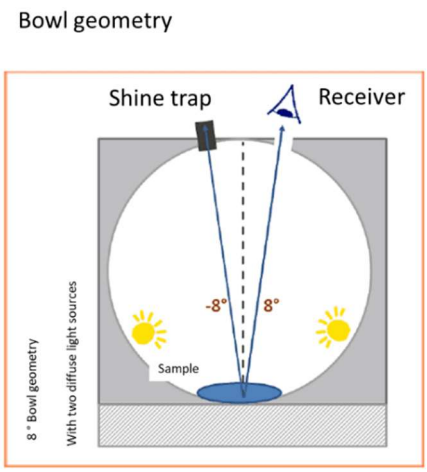
4.2 COLOR MEASURING PRINCIPLES

The anticipation of color is influenced:

- By the surrounding light
- The structure surface of the material
- Subjective color anticipation.

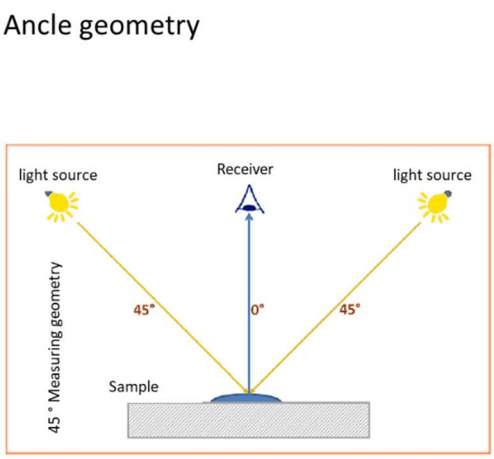
Currently there are two measuring methods on the market:

A) 8° diffuse – sparing the technical details, a method that is intended to eliminate for production (color computers at dying machines and their recipes) as many surface influences as possible by the angle the measurement is taken.



Picture 7: principle behind 8° diffuse color measuring, Color Digital GmbH, Cologne 2020

B) The 45 ° / 0 ° measurement geometry (measurement at 0 ° and Illumination at 45 ° with two offsets by 90 ° Light sources) complies with German DIN 5033 recommendation for measurements on shiny surfaces (e.g. painted objects). The reverse geometry 0 ° / 45 ° can also be used.
The following picture shows the 45 ° / 0 ° measurement principle.



Picture 8: principle behind 45 ° / 0 ° measurement principle, Color Digital GmbH, Cologne 2020

In opposite to 8° diffuse, the purpose of this method is to also measure the surface influences because those are needed to use the results for virtual products, which are only good when they look realistic.

The following picture shows the visual difference between both methods.

Picture 9: Example for visual difference between 8° diffuse color measuring and 45 ° / 0 ° measurement principle, Color Digital GmbH, Cologne 2020

The project team spent quite some time to understand, a) that there is not a "better or worse" between the two measuring principles and b) that the right choice can only be determined within the following scenarios.

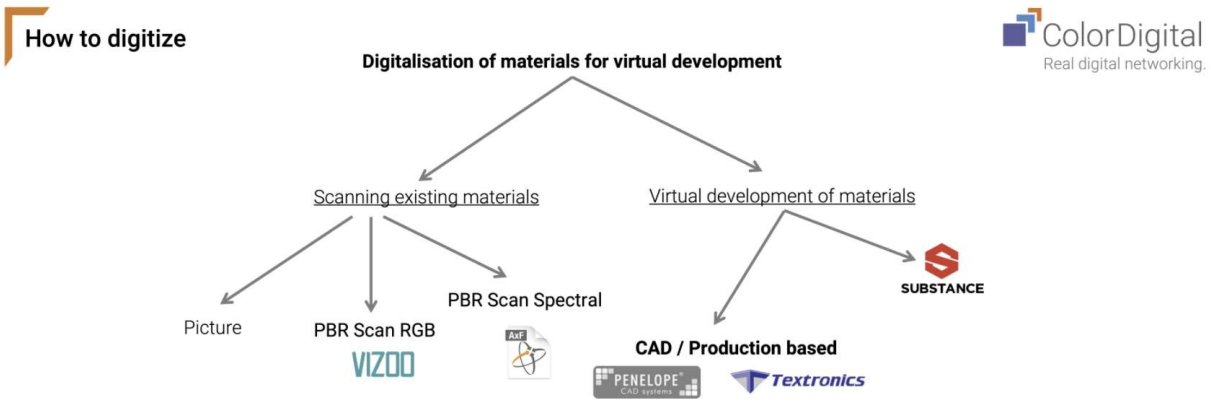
Scenario	8 degree diffuse	45 degree	Remarks
Screening color of an object objectively	preferred	Sometimes possible - depending on physical environment like e.g. surface; light	
Legally compliant measurements	possible	possible	No mix of methods → both ends need to use the same measuring method
Calculate a recipe for a color	preferred	Sometimes possible - depending on physical environment like e.g. surface; light	
Digitize material and colors for virtualization	Sometimes possible - depending on physical environment like e.g. surface; light	preferred	

Picture 10: Scenario based differences and recommendations between 8° diffuse color measuring and 45 ° / 0 ° measurement principle, Color Digital GmbH, Cologne 2020.

4.3 VIRTUAL MATERIAL PARAMETERS

Color is only one element determining materials.

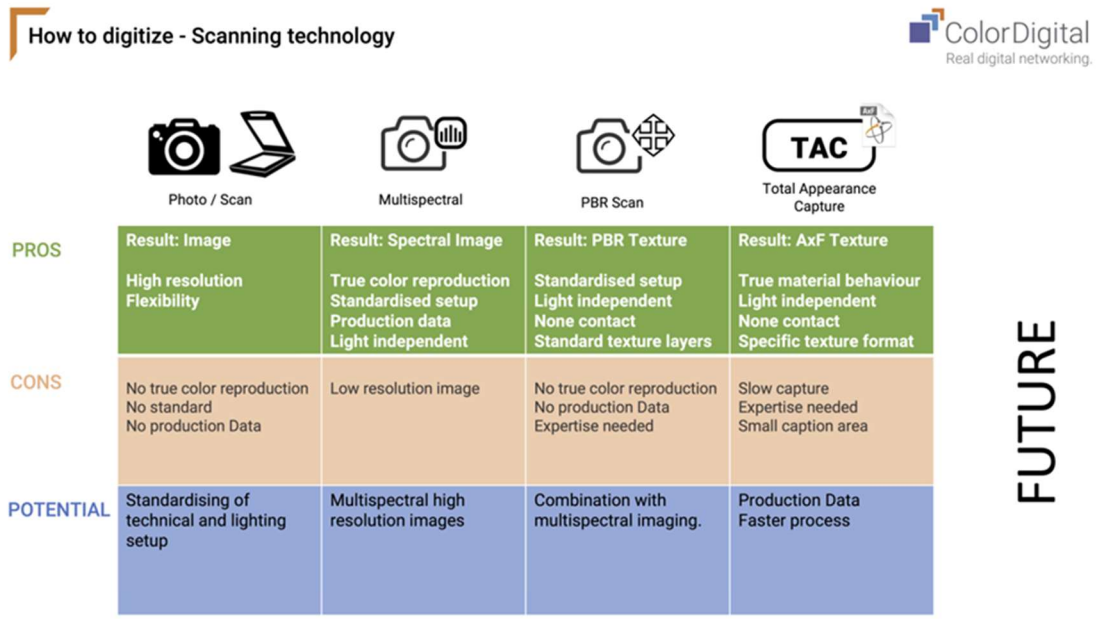
The second element(s) are the material textures, where the methodical approach is different a) if a company wants to digitize textile products that already exist or b) if they create virtual products that don't exist yet.



Picture 11: strategic option how to generate digital material parameters, Color Digital GmbH, 2020

4.3.1 SCENARIO A = SCANNING

One of the many challenges with scanning existing materials is, that there is not "The scanning" but the following 4 options, each with pros and cons.



Picture 12: Scanner technology alternatives with pros & cons, Color Digital GmbH, 2020

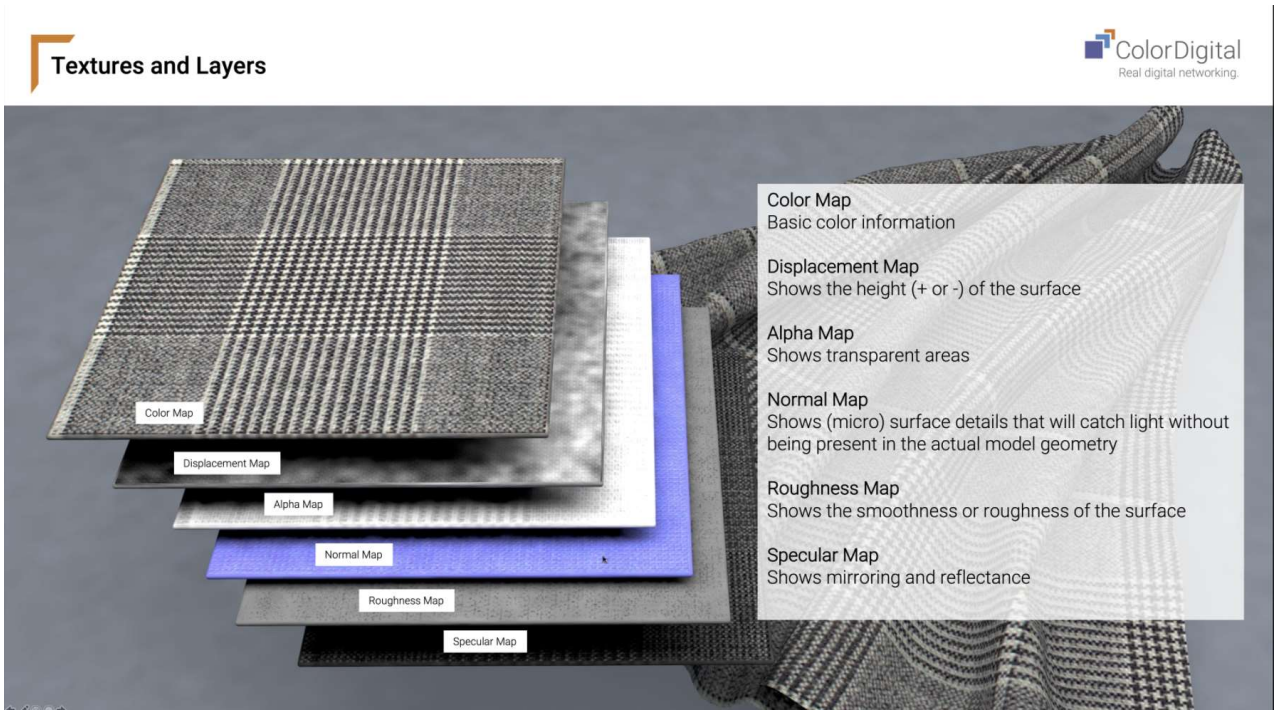
The wish for the future is that TAC technology becomes faster and less expensive. It seems that there are interesting alternatives coming on this field within 2020 (no more details due to Non-Disclosure Agreements possible).

Learning: the better the scanning results, the more the topic "process time per scan" becomes relevant.

4.3.2 SCENARIO B = THE CREATION OF VIRTUAL TEXTILE MATERIALS THAT DON 'T EXIST, YET.

Practically in all virtualization-software tools, like e.g. Vidya or CLO so called Physical Base Rendering (PBR) is the technical backbone with the goal to real-time render all relevant factors.

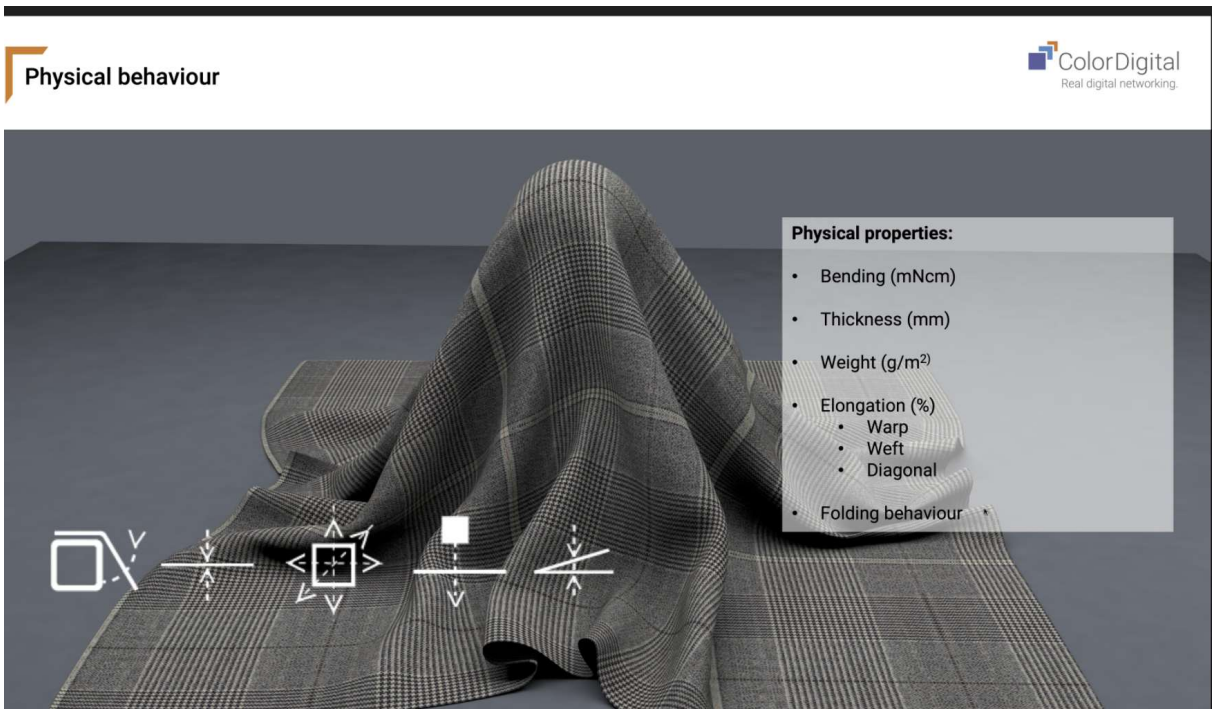
Physical Base Rendering (PBR) follows a layer concept with the same software elements in all software products following picture shows in detail.



Picture 13: Visual example for Physical Base Rendering, Color Digital GmbH, Cologne 2020

This way PBR can deliver a realistic virtual view by generating "virtual texture" which is next to color only the second textile element in virtual product development.

The third element is how the fabric virtual flows, which is critical for a realistic virtual image. The 5 physical properties around this "flow part" (German: "Fall der Ware") you find on the next picture.



Picture 14: Visual example for physical properties needed to simulate the "flow part" of a virtual material, Color Digital GmbH, Cologne 2020

At this point we want to recommend and to point out a valuable Dialog Textil Bekleidung (DTB) initiative in Munich, which is working since fall 2019 on defining rules for Fall und Folding behaviors of materials, precisely on the Warp and Weft part related parameters and virtual elasticity topics.

Another important development on this field is, that HUGO BOSS AG created a document called "digital ready" for their material suppliers, describing what parameter data they expect from them and in which file format.

4.3.3 Results, learnings & recommendations

There are two relevant learnings from this project part:

a) We hear a lot, that companies express their firm opinion like e.g. "well, then I buy myself an XYZ scanner and then I am set and done".
The sad truth we experienced is different, and we recommend starting small with color and then move slowly to build up scanning know how and then start virtual product development, which is why all this is relevant.
The benefits of a pure digital/virtual product are so significant, that we will see very soon the same situation as in industries like furniture and automotive where analog samples are a relic from the past.
b) Most modern production material vendors create their products already with software and often have the data already.
We strongly recommend talking to your supply side and find out what data they already have that you can use.

This fits into significant trends as our industry is currently anyway changing towards more collaboration, as the next chapter explains with another important facet of collaboration.

5 COLLABORATIVE PLANNING AND FORECASTING

5.1 INTRODUCTION

This was the most paradox of all three project scopes. On one hand we had had the best preparation, because we had a so called GUSI (Global Upstream Initiative) document by GS1 Germany/Consumer Goods Forum, describing in detail what to do for successful Collaborative Planning and Forecasting. On the other hand, this project part is the most unfinished, but will deliver on the long run hopefully the most promising and most valuable results.

For more GUSI document details, which is currently only available in German, please contact Mr. Andree Berg from GS1 Germany at andree.berg@gs1.de .

In the first step we translated and shared parts of the GUSI document with the participants.

In a next step the group decided to use the following overview from the GUSI document as our guideline and framework, what steps to go and in which order:

Building Blocks	Manufacturer Process	Transaction	Supplier Process
Integration Agreements	Agree on business rules	Integration Agreement	Agree on Business Rules
Master Data Alignment	Maintain Master Data	Item Master Data	Maintain Master Data
Purchase Conditions	Agree on Purchasing Conditions	Purchase Conditions	Agree on Purchasing Conditions
Demand & Supply Signals	Report Inventory	Inventory	Report Inventory
	Gather material requirements	Purchase Order	Plan production & supply
		Net requirements	
		Consumption Forecast	
		Replenishment Forecast	
	Integrate Information	PO/Net Requirements Conf.	Confirm Delivery
		Delivery Plan	
Despatch, Receipt & Consumption	Await Shipment	Dispatch Notification	Pick & Pack goods
	Receipt of Goods	Physical Shipment of goods	Pick & Pack goods
	Check Goods	Receipt Notification	Goods Receipt Notification
	Consume Goods	Consumption Report	Consumption Notification
Financial Settlement	Invoice Receipt	Invoice	Create Invoice
	Create self-billing Invoice	Self-Billing Invoice	Invoice Receipt
	Invoice Confirmation	Invoice Confirmation	Invoice Confirmation
	Create Remittance Invoice	Remittance Notification	Payment Notification
	Initiate Payment	Physical Payment	Payment Receipt

Picture 15: Upstream Integration Model (UIM). Source: GUSI working group, Cologne 2009

This document in combination with first practical input from various team members helped us to determine in a first step – and the fact that we mention this commodity fact shows where we started – to evaluate with the following formula the dependencies between stock level and ability to deliver:

Question: What service level do you like to offer your customer?

Service Level	σ
70,0%	0,5240
90,0%	1,2816
95,0%	1,6449
98,0%	2,0537
99,0%	2,3263
99,5%	2,5758
99,9%	3,7190

Safety Stock = Service Level * Standard Deviation

$$Safety\ Stock = \sigma * \sqrt{\frac{\sum(x - \bar{x})^2}{(n-1)}}$$

Picture 16: Standard formula and defined multiplier values to calculate stock level – delivery ability level dependencies – Klaus Baader from Freudenberg Performance Materials Apparel SE & Co. KG, Weinheim, 2020

This brought the group a better understanding about the specific needs of production material vendors and laid a first base for trust which was the base for the next steps and results.

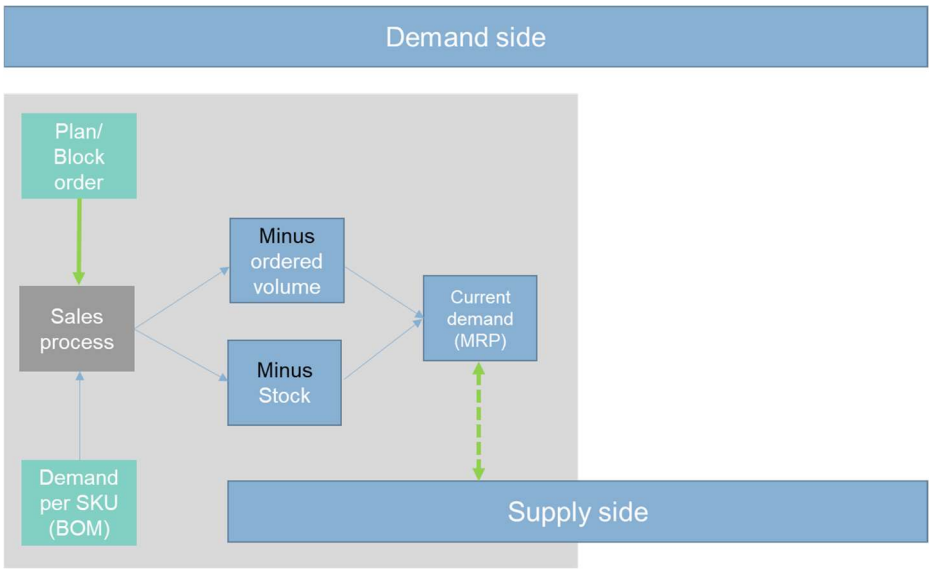
5.2 DEMAND DATA

The next surprise was the fact, that all modern ERP software offers a function that is called different within ich software, can be generally named though Material Requirement Planning or MRP.

Learning 1: The group found out, that way the systems work including the algorithms used might be different.

The core processes behind plus correspondingly the data structure of the MRP seems to be rather identical, though in all systems.

The following picture shows the core mechanism/processes behind these findings:

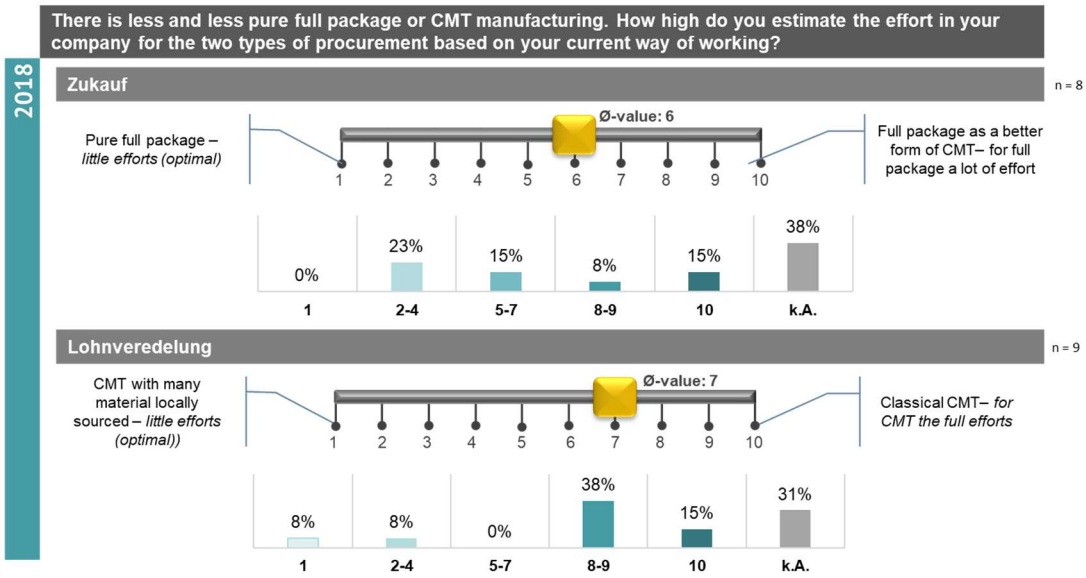


Picture 17: Defined overview of demand processes in textile value chains, GCS Consulting GmbH, Munich 2020

Learning 2: A second important detection was the fact, that knowing the demand volume of an item/SKU at a specific date or time period is not enough, but that any international vendor needs the subvoume per location, where the demand is needed.

The following picture shows, that determaning of materials becomes more and more important in the textile value chain.

One of the reasons are increasing requests to avoid certain chemicals, so it pays to determin/nominate materal vendors with a proven history to avoid huge costs for laboratory tests. The following picture shows market insights regarding details of this situation.



Picture 18: Current level of nomination/determination of material in CMT and Full Package manufacturing business, SCM benchmark, GermanFashion Modeverband Deutschland e.V. /GCS Consulting GmbH, Cologne/Munich 2018

Intense project meetings showed, that determaning materials can happen in 3 variants, which impact significantly the value demand data for the vendor, even correct one have:

a) Mandating: the manufacturer ist exected to firmly order at one vendor – the group agreed to call this – in oposite to some payers in the market – "mandating".
b) Nominating: a form of determination, where the manufacturer is supposed to buy the material fro 2 or more of his suppliers is called "nomination".
c) Free: the manufacturer is free where to buy the reuiremd material.

Learning 3: In all 3 cases it would be benefitioal for the material vendor not only to know the country where the demand will occur but als the volume per manufacturer – only this way the demand data can have the full value for the vendor side.

Therefore the current generic data structure on SKU base could be determined:

- SKU identifier
- Time of demand (day or period)
- Determanitation type (free, mandated, nominated)
- Country of demand
- Manufacturer belonging to the demand.

The group agreed that this insight and the limited volume of data needed is a big chance for more exhange of developing demand data – with a very limited set of data.

This will need additional finetuning though and is already part of the work in the implementation initiative.

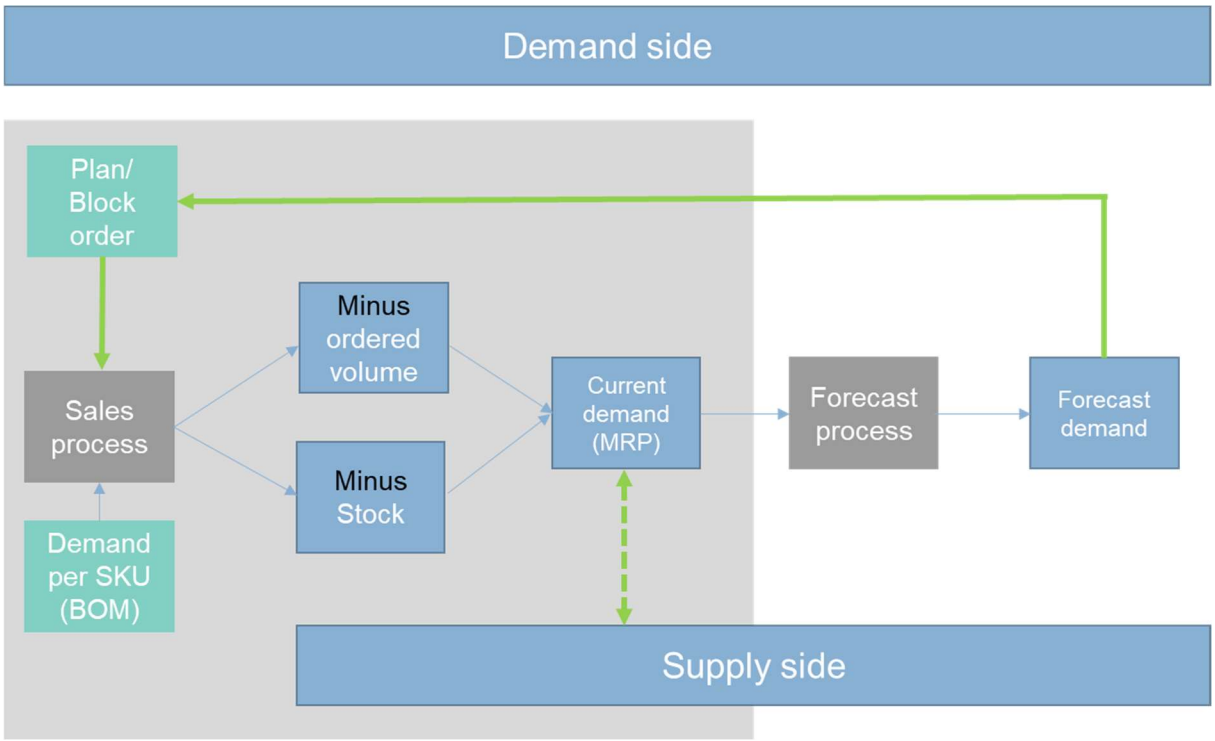
5.3 Collaborative forecasting

In another step the group evaluated, if exchanging forecasted demands requires an own set of data an/or even worse another exchange of data.

As the variety of way of forecasting can range from the stock manager determining necessity by visual checkups to integrated planning with sophisticated forecasting tools this insecurity was quite high when the groups came to ways to forecast collaboratively.

Learning 4: The answer was surprisingly simple. It turned about, that each forecasted demand finally was in practically all evaluated cases turned into stock order – most times with a signal feature within the master data, so that the demand volumes for cases this will be needed can be kept separately in the ERP or other IT systems.

As the following graph shows, this way forecasted stock volumes become part of the "normal demand" dealt the same way as described in 6.2.



Picture 19: Defined overview of demand & forecast processes in textile value chains, GCS Consulting GmbH, Munich 2020

The group agreed that this point and how the right data structure can be handled shall be part of a continuation of this workgroup after the pilot project within the new implementation activities.

5.4 Additional information on global upstream initiative GUSI

In 2009 a Global data exchange has already been seen, then not with end to end glasses, but focused on the upstream part of the supply chain (material to brand).

The results of extensive research work at that time has been published first by GS1 and then been forwarded to the Consumer Goods Forum.

The main author of the GUSI whitepaper/guideline is Rüdiger Hagedorn, who left GS1 Germany GmbH and is today Director for end to end value chains at the Consumer Goods Forum.

For more GUSI document details, which is currently only available in German, please contact Andree Berg from GS1 Germany at andree.berg@gs1.de .

5.5 Results, learnings & recommendations

The members strongly believe that we will not see a sustainable textile sector without collaborative planning and forecasting as there will be no end of obsolete overproductions with correlated unnecessary use of resources.

This focus of the Pilot Project Data Exchange was determined by a high degree of uncertainty and the members foresee a long, but valuable way to the necessary grade of collaboration and the necessary culture of trust, any partnership requires.

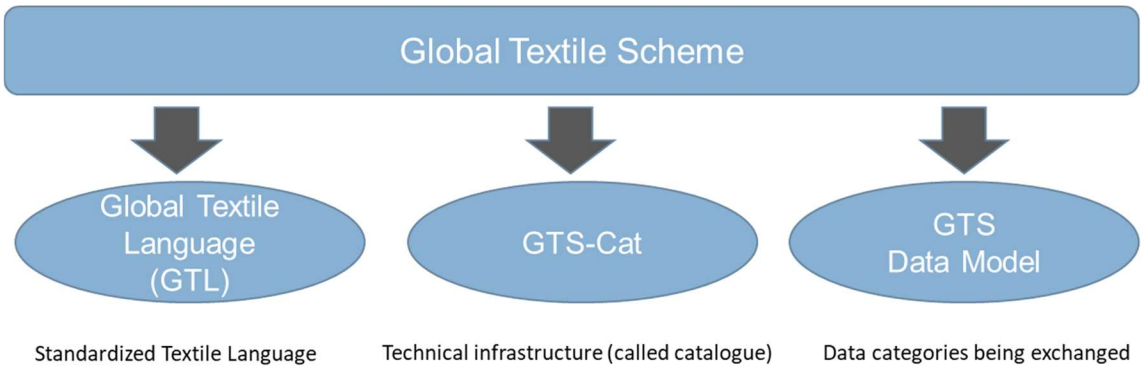
6 Global Textile Scheme - GTS Components

Global Textile Scheme is a new Scheme with 3 elements to organize Textile and Fashion meta data with standardized structures and attributes, which we believe has the potential to create on the long run a joint Global Textile Language for automated data exchange from fibre to recycling.

It consists out of:

1. Global Textile Language (GTL): a so called "Global Textile Language (GTL) attribute list" with product describing features and feature values, which is set up in a way, that it allows innovative technologies like e.g. Data Ports to "pull data" – an important prerequisite for automated data exchange in real time all along the global Textile and Fashion sectors.
2. GTS-Cat: a technical infrastructure tool, and next to GTL and GTS Data Model and core element of the upcoming implementation period, starting in August 2020.
3. GTS Data Model: a dynamic and generic Data Model, that covers not only product describing attributes, but intentionally also additional data categories like e.g. Generic Master Data, confident Trade Data, Documents and selected Transaction Data (e.g. Demand Data). Right this moment the first draft of data categories is defined and will be implemented in GTS-Cat.

The following picture shows the elements of the Global Textile Scheme.



Picture 20: The elements of Global Textile Scheme, GCS Consulting GmbH, Munich 2020

All components will be described with more details in the following chapters.

6.1 GLOBAL TEXTILE LANGUAGE (GTL) ATTRIBUTE LIST

The Global textile Language follows our natural language describing textile products and features. As we want to "Pull Data" in the future, we need to address "what we want to pull". This requires a list with precisely named/defined data, which we want to pull, following a standardized logic.
As we wanted to work with all defined data in multiple languages it was clear, that each of the defined data would need a specific code.

The idea behind all this was, that in the future, all staff dealing with the data will deal at the front end with the data terms in each person's normally used language – and that in the back the IT systems is only handling the corresponding codes.

Sounds more complicated as it really is - as it turned out, that an organization called ETIM International was using those principles already for many years for product describing attributes for finished products in electronics, construction and Do it Yourself industries/sectors.

The members do appreciate, that ETIM International allowed our group to use the logic as a foundation for our work which we did.

As the result, the GTL attribute list consists out of:

a. "Sectors", which helps at orientation and allows a potential extension of the Global Textile Scheme to industries outside textile.

   The Sectors follow the idea of functions described in chapter 4.1.1.2. and are in detail:

   - Raw material function
   - Production Material function
   - Manufacturing function
   - Producer/Brand function
   - Retail function

b. Product Groups: the second element, also only meant for orientation in a huge set of data, are the so called "Product Groups".

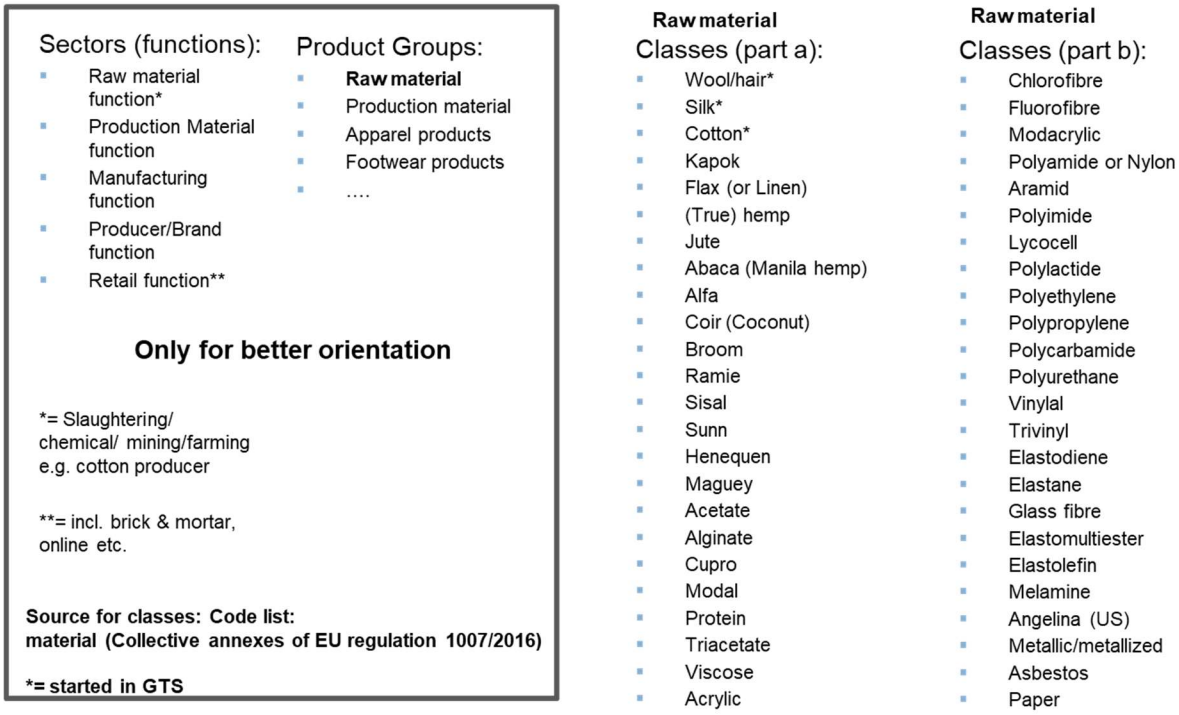
The Product Groups are in detail:

- Raw material
- Production material
- (Finished products) Apparel products
- (Finished products) Footwear products
- (Finished products) … more to come

c. Product Classes: Each Product Group has as the third element its own so called "Product Classes" defining each product as one class, e.g. cotton, buttons, or coats.

All classes start in the GTL attribute List with the feature "subclass".
This allows to keep the classes per product group very compact.

The following picture shows as an example the first part of raw material classes from the GTL attribute list.



Picture 21: Work slide to define the raw material classes in Workgroup 2.1, GCS Consulting GmbH, Munich 2020

Learning: As we are talking about product defining and describing attributes for a whole sector, which even might be a role model for other industries or sectors, it is critical to structure the data managed by the Global Textile Scheme in a way that future users, not knowing the background of the GTS Attribute list can orient themselves easily and at all times.

6.1.1 GTL FEATURES AND VALUES LOGIC

As mentioned before, the necessity to "Pull Data" requires identifying exactly what needs to be pulled. "Exactly" in this sense means, that each data is defined as a precise "term" including its corresponding semantics, which is its exact meaning.

To create such precise terms, the Global Textile Scheme creates a so-called Global Textile Language attribute list with 4 type of features:

- Type A – for features that have one or more values I a list, each with a unique identifier.
- Type L - for logic features that represent a "yes or no".
- Type N - for features that require a numerical input – in combination with the numerical unit that belongs to the numerical input.
- Type R – for features that require a range input in the form "From… to ….."

As the users of the system work in different languages, it is critical to offer the terms/data in this attribute list in many languages.

Being multilingual requires per term/data that is supposed to be pulled the definition with a unique code element.

6.1.2 THE GLOBAL TEXTILE LANGUAGE IDENTIFIER

Thinking in end to end is more than just a fancy idea that will disappear very soon.

It is THE important prerequisite to fulfil the next upcoming Efficiency, Sustainability and Recycling requirements of the near future – not to speak from increasing service demands from consumers.

Many talks with global experts showed that it seems, that the Textile & Fashion Sector is currently the first sector moving this end to end direction consequently when it comes to terms of data exchange.

This is the reason why certain terminologies were intentionally designed and chosen (e.g. the 12-digit code which is longer as the textile sector would need it), to allow other industries and sectors to cover the principles. So, it would be not a problem to design a "Global FOOD Scheme" if the food sector follows the trend – just optional as first talks in a similar direction have started.

Regarding the necessary GTS coding necessities the whole system was designed to work as little as possible with "Speaking Number Elements", as it increases chances for mistakes and therefore speaking code elements were only used where the group found and decided, that the benefits overweighed significantly the risks.

Following this decision, in the Global Textile Language the following elements get encoded (abstract) and contain a speaking element:

- The Whole GTL attribute list: all codes start with a "T" for Textile, (which could be in other sectors a "C" for construction or a "F" for food or ....).

- The Product Classes: e.g. TCXXXXXXXXXX - all codes with a "C" as second digit behind the "T".

- The Product Features: e.g. TFXXXXXXXXXX - all codes with a "F" as second digit behind the "T".

- The Feature Values: e.g. TVXXXXXXXXXX - all codes with a "V" as second digit behind the "T".

The following picture shows a bilingual "Button" - example for a better understanding:

Production material class:	TC0200000010	Button						
Code	**Description**	**Type**	**Unit**	**Unit (imp.)**		**Value code - Description**		**Beschreibung**
TF0000000001	Unterklasse Knopf	A				TV0000000001	Hole Button	Lochknopf
						TV0000000002	Shank Button	Ösenknopf
						TV0000000003	Snap Button	Druck Knopf
						TV0000000004	Jeans Button	Jeans Knopf
						TV0000000005	Tape Button	Bandknopf
						TV0000000006	Toggle	Knebel
						TV0000000007	Cufflink	Manschettenknopf
						TV0000000008	Other	Andere
TF0000000002	Anzahl der Löcher bei Lochknöpfen	N						
TF0000000003	Loch-Durchmesser bei Lochknöpfen	N	mm	inch				
TF0000000004	Druck Knopf Systeme					TV0000000009	S-Spring system	S-Feder System
						TV0000000010	Brass Ring spring	Messingring Feder
						TV0000000011	Nylon Ring spring	Nylon Ring Feder
						TV0000000012	Prong system	Prong system
						TV0000000013	Sew on snap button	Sew on snap button
						TV0000000014	Other	Other
TF0000000005	Druck Knopf Kappen-Typ	A				TV0000000015	Hidden snap	Verborgene Druckknopf Kappe
						TV0000000016	Visible snap	Sichtbare Druckknopf Kappe
						TV0000000017	Reversabel snap	Reversible Druckknopf Kappe
						TV0000000018	Other	Andere
TF0000000006	Jeans Knopf Type	A				TV0000000019	Fix jeans button	Fester Jeans Knopf
						TV0000000020	Movable Jeans button	Beweglicher Jeans Knopf
						TV0000000021	Other	Andere
TF0000000007	Form	A				TV0000000022	Round	Rund
						TV0000000023	Square	Quadratisch
						TV0000000024	Oval	Oval
						TV0000000025	Rectangular	Rechteckig
						TV0000000026	Triangular	Dreieckig
						TV0000000027	Special shape	Spezielle Form
						TV0000000028	Other	Andere
TF0000000067	Farbe	A				TV0000000029	Colourless	Ohne Farbe
						TV0000000030	Transparent	Transparent
						TV0000000031	White	Weiß
						TV0000000032	Beige	Beige
						TV0000000033	**Yellow - orange**	Gelb - Orange

Picture 22: Button example for GTS attribute list (with real codes), GCS Consulting GmbH, Munich 2020

Regarding speaking numbers, the system uses the following coding for the coding of the Product Groups:

- Group Raw material classes – 01 → TC01XXXXXXXX
- Group Production material classes – 02 → TC02XXXXXXXX
- Group Finished products Apparel – 03 → TC03XXXXXXXX
- Group Finished products Footwear – 04 → TC04XXXXXXXX
- Group Finished products ???? – 05 → TC05 XXXXXXXX

We used two digits as the space allowed it and as there might be more than 10 finished products using the Global Textile Scheme in the future.

We used a speaking number at classes, because classes always belong to one Product Group category and this 2-digit speaking number might help in the future to establish logic filters for better data quality.

6.1.3 GLOBAL TEXTILE LANGUAGE DETAILS

6.1.3.1 GTS classes principles

We wanted to design the Global Textile Scheme with as few classes as possible to keep the structure at the top compact and easy to understand.

- The Raw Material classes were rather easy to determine, as there are official sources that could be used, e.g. Code list: material (Collective annexes of EU regulation 1007/2016). Because OEKOTEX 100 is a very familiar Sustainability- and CSR-standard in Germany and neighboring countries we diverted the long list of raw material classes into "non Oekotex material classes" and "OEKOTEX" materials, explicitly mentioned in the standard.
  If we decide in the future that this doesn't make sense we can change it, as the classes codes are individual and this is for orientation only.
- The Production Material classes might see changes in the future, as the group working on them wasn't too big and alternative opinions regarding the classification might come up in the near future during the implementation phase.
- Finished Product Apparel - particularly the German market is determined by the following Apparel Product classifying standards:
  - BTE
  - BDSE
  - DTB
  - eClass
  - FEDAS
  - GS1

The thoughts and consequently the structure behind each categorization system varied that much, that so far it was considered as "mission impossible" to try to synchronize these different methods.

BTE and FEDAS use a list of lifestyle worlds, e.g. Ski Alpine, Golfing, Polo, etc. We used this list to create an own feature "Activity areas" – Type A with the FEDAS and BTE lifestyle worlds as values.

Learning: With this trick it was possible to reduce the Apparel classes significantly.

6.1.3.2 Raw material classes

The Global Textile Scheme currently works with the following Non-Oekotex Raw Material classes:

- Wool/hair*
- Silk*
- Cotton*
- Kapok
- Flax (or Linen)
- (True) hemp
- Jute
- Abaca (Manila hemp)
- Alfa
- Coir (Coconut)
- Broom
- Ramie
- Sisal
- Sunn
- Henequen
- Maguey
- Acetate
- Alginate
- Cupro
- Modal
- Protein
- Triacetate
- Viscose

- Acrylic
- Chlorofibre
- Fluorofibre
- Modacrylic
- Polyamide or Nylon
- Aramid
- Polyimide
- Lycocell
- Polylactide
- Polyethylene
- Polypropylene
- Polycarbamide
- Polyurethane
- Vinylal
- Trivinyl
- Elastodiene
- Elastane
- Glass fibre
- Elastomultiester
- Elastolefin
- Melamine
- Angelina (US)
- Metallic/metallized
- Asbestos
- Paper
- Polystyrene
- Feathers
- Rubber
- Coating
- Latex
- Fur
- Biocomposites
- Metacrylate,

The Global Textile Scheme currently works with the following Oekotex related Raw Material classes:

- Corozo
- Mother of pearl

- Glass fibre
- Porcellaine
- Tortoiseshell
- Horn
- Bone
- Wood
- Metal
- Hide (raw Leather)
- Polystyrol
- Polyamide or Nylon
- Polyester
- ABS

6.1.3.3 Production material classes

The Global Textile Scheme currently works with the following Production material classes:

- Yarn
- Leather*
- Fabric*
- Lining
- Interlining*
- Belt
- Tape & Strings*
- Cord
- Button*
- Hook set
- Buckle*
- Eyelet*
- Rivet
- Loop
- Chain
- Zipper
- Sewing thread
- Label*
- Hanger*
- Shoulder pad

- Strass
- Cardboard
- *= started already in the GTL attribute list.

6.1.3.4 Apparel product classes

Learning: Due to the "trick", mentioned in 6.1.3.1 GTS classes principles plus by using the subclass principle to a huge extend the Global Textile Scheme currently can work with the following, concentrated (Finished Products-) Apparel classes:

- Coat*
- Jacket*
- Suit (m/w/d)*
- Vest*
- Blazer*
- Woven Pants*
- Knit Pant*
- Skirt*
- Sweater*
- Cardigan*
- Woven Shirt*
- Knit Shirt*
- Blouse*
- Tops*
- Woven Dress*
- Knit Dress*
- Overall*
- Underwear
- Nightwear
- Swimwear
- Sport clothes
- Bathrobe
- Apron (Schürze)
- Cloths (Tücher) & Scarves
- Legwear
- Headband

- Wristband
- Belt
- Handkerchief
- Glove
- Bow tie/fly
- Hat and cap

*= started already in the GTL attribute list.

As the values in the subclasses of each class are very well determined, the group doesn't expect many changes on these classes.

6.1.3.5 Footwear product classes

The basis of our work was the European Article system of the Shoe Market, by BDSE (Bundesverband des Deutschen Schuhhandels e.V. and HDS (Hauptverband der Deutschen Schuhindustrie):

Looking closer at the thinking and structure behind this product categorization system showed, that by working with subclasses and defining the following 7 features the list of shoe classes in GTS can be reduced as well:

	Type
• Sole type	A
• Sunken Footbed	L
• Comfort	L
• Lining type	A
• Heel - wedge type	A
• Surface type	A
• Shaft hight	A

Based on this, the Global Textile Language currently can work with the following, concentrated (Finished Products-) Footwear classes:

- Lace-up shoe
- Slipper
- Boots
- Slip-on shoe
- Sandals

- Pumps & Ballerinas
- Home slippers
- Sport special shoes

So far there was not more detailed work as described, e.g. are all subclasses missing, yet. There will be quite some work to be done.

6.2 GTS-CAT – THE TECHNICAL INFRASTRUCTURE

6.2.1 BACKGROUND

Most technical data pool or platform solutions are:

a. Solely downstream oriented,
b. Cover a rather small range of specific data categories, e.g. picture data or packaging data
c. Or are defined by a & b.

Often – which is natural – each of those solutions has its own data structure. As each scope is different, the structure behind each individual data structure often is rather undynamic. As the Global textile scheme covers new "Upstream" product features and many new finished products features as well and the GTL List is far from being finished, any technical solutions needs to be designed very flexible – which is currently hard to find.

Each platform requires its own interface mechanism and no matter how API supported and comfortable such interfacing can be established, it creates workload in any IT department of companies in the Textile and Fashion sector, which are in most cases small, or even very small companies.

This was one of the reasons, why quite a few of such small companies joined the Pilot Project Data Exchange.

EDIFACT based data exchange has never been designed to cover upstream data and currently there are 8 EDIFACT messages intensively in use, mostly around order processes.

The biggest challenge behind EDIFACT based data exchange is the fact though, that the receiver always must wait, until the sender sends the data.

This is suboptimal in times of increasing consumer transparency demands and related real-time requirements the textile sector is facing.

As a result, any new technical solution in the future should be simple and inexpensive, easy to connect with the own IT and to be used by many market players to create an interesting business case.

6.2.2 GTS-CAT

The scope of the Global Textile Scheme is end to end and it covers not only Master Data and product describing attributes, but many other components, described in the next chapter.

6.2.2.1 GTS-Cat Data Model components

As the Global Textile Scheme is broad and deep and all existing technical alternatives like e.g. GDSN by GS1 are not capable to adapt to so many new data, the group decided to invest and establish an own, so called GTS-Cat technical infrastructure - inexpensive, dynamic and designed to the requirements described in this document.

In detail GTS-CAT is supposed to manage data from the following data categories, explained more in detail in chapter 7.3

- Generic Master Data
- Product features
    - Non-regulated
    - Regulated
- Trading conditions
- Documents
- Selected Transaction data.

6.2.2.2 GTS-Cat functionalities

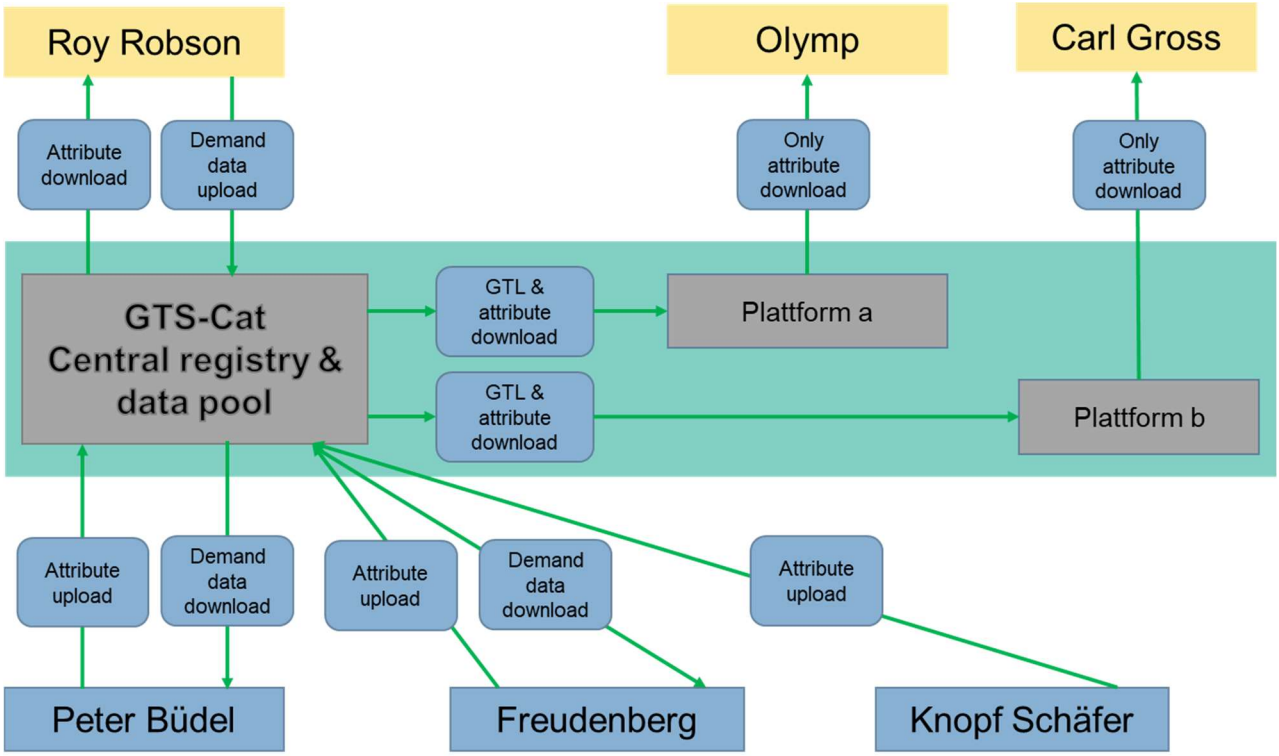
Among others (currently in development) the key functions of GTS-Cat will be:

a. A registration function with right role management, to determine which party can see which data and from which sender.
b. A function to download the GTL attribute list – to have a joint "language" among the users to work with.
c. A GTS phone book function to determine where requested data can be found.
d. A function to upload product describing attributes on trade item base. This function is based on a standardized data structure following recommendations of an organization named "Dialog Textile Bekleidung" in Munich , who defined many years ago a well working set of data for fabrics and trimmings to be exchanged between textile vendors and Fashion brands.
e. Demand data, following the data structure described in chapter 6.2.

6.2.2.3 GTS-Cat architecture

There will be two ways to generate the attribute data that need to be "pulled":

a. For companies with limited IT sources a data pool function that can be filled – worst case – with an Excel file, in a better alternative with a standardized API.
b. For companies with better IT resources the "phone book function" will allow to identify the data source and allow (when agreed by the sender) with a special onetime allowance token a bilateral data exchange outside GTS-Cat.
c. To stay neutral and because the group expects such wishes by data users already registered to third party platforms, there shall be a mechanism to connect other platforms to GTS-Cat like the following picture explains.

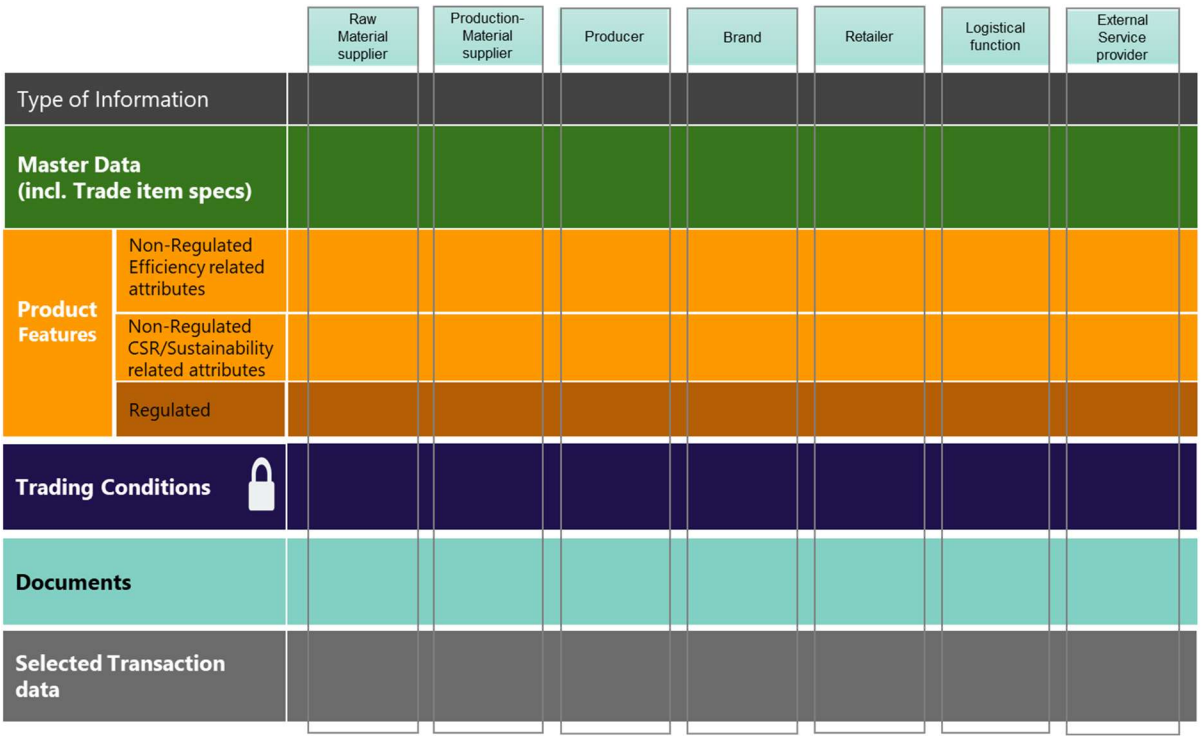


Picture 23: Current draft GTS-Cat architecture, GCS Consulting GmbH, Munich 2020

6.3 GTS Data Model

The idea behind the GTS Data Model is to cover the whole textile value chain with one data model and to exchange as many labor-intensive data as possible.

As one can see on the following picture the choice of any new data layer should be well considered, as it creates a significant increase of complexity within the whole model.



Picture 24: current GTS Data Model components, GCS Consulting GmbH, Munich 2020

Before we come to the individual data layers, we need to explain in the next two chapters two innovative and important assumptions and prerequisites

6.3.1 END TO END PRODUCT IDENTIFIER

In the before described end to end scheme it is critical, that the item which related data shall be exchanged, can be identified in a standardized way.

Downstream, The Global Trade Item Number (GTIN) by GS1 has a market share of 90%, because the GTIN is the core identifier for finished products, e.g. at the cashier in supermarkets.

Upstream the GTIN is not very widely in use.

At a certain point within the project the group decided to also recommend the use of GTIN for Raw Material and Production material products.

The current, latest status is that we want to leave this open, because there are options on the table to use a new GTS ID as a second possibility for identifier.

This question will be further evaluated in the now coming implementation phase, parallel to building the GTS-Cat infrastructure where this needs to be determined.

6.3.2 SUPPLIER MASTER DATA – TRUE CODE

In n to n relationships exchanging data like described in above GTS-Cat architecture picture two elements are critical:

a. The parties can be identified with a defined company identifier and
b. That the data donor can determine in such n : n environment for each user what data can be publicly seen and what data categories are privat.

Since 2019 there is a very promising pilot project running with the activities of the Consumer Goods Forum, addressing this exact topic.

The idea behind the so called "True Code" concept follows the principles of a passport.

Each passport has:

- Unique identifying elements,
- A defined set of data elements – identical in each passport and
- Public and private elements.

As is the n:n data architecture, planned within GTS-Cat, the users will face exactly such challenges, the group decided to use the following TRUE CODE data elements within the registration and data exchange configuration process:

UUID code/True-code:	Public
Supplier/Product Name organisation:	Private
Role/function: primary producer/farmer, producer group/cooperative, packhouse, processor, logistic service provider, importer, exporter, trader (importer/exporter, distributor), retailer	Public
Sector (product group, commodity)	Public
Address:	Private
Postal code and place:	Private
Country:	Public
Turnover of the organisation registered on this location:	Private
CoC number/legal registration number:	Private
Website:	Private
IBAN code:	Private
GLN:	Private
GGN number (group or individual)	Private
GPS coordinates : Dutch: http://www.gpscoordinaten.nl/bepaal-gps-coordinaten.php / English: http://www.gpscoordinates.eu/determine-gps-coordinates.php	Private
Total surface/hectares in use	Private

DBID number:	Private
Data port address:	Private
Number of employees:	Private
Number of male employees:	Private
Number of female employees:	Private
Number of temporary workers:	Private
Number of migrant workers:	Private
UUID code/True-code:	Public
Supplier/Product Name organisation:	Private
Role/function: primary producer/farmer, producer group/cooperative, packhouse, processor, logistic service provider, importer, exporter, trader (importer/exporter, distributor), retailer	Public
Sector (product group, commodity)	Public
Address:	Private
Postal code and place:	Private
Country:	Public
Turnover of the organisation registered on this location:	Private
CoC number/legal registration number:	Private
Website:	Private
IBAN code:	Private
GLN:	Private
GGN number (group or individual)	Private
GPS coordinates : Dutch: http://www.gpscoordinaten.nl/bepaal-gps-coordinaten.php / English: http://www.gpscoordinates.eu/determine-gps-coordinates.php	Private
Total surface/hectares in use	Private
DBID number:	Private
Data port address:	Private
Number of employees:	Private
Number of male employees:	Private
Number of female employees:	Private
Number of temporary workers:	Private
Number of migrant workers:	Private

Picture 25: Supply Chain Information Management B.V. , Alkmaar, NL 2020

6.3.3 Master Data including trade item specs

Recommended so by experts, the group decided to differentiate between master data and product feature. One reason was, that there exist generic and well standardized trade item specification like, e.g. weight, packaging measurements and others, well defined and already in a standardized use.

6.3.4 PRODUCT FEATURES

Product features in this sense are features, that describe and define a product.

Within the GTS Data Model, we differentiate between nonregulated features (generic and Sustainability/CSR related) and regulated features in correlation with legal requirements.

In the food sector many more features are currently regulated as within textile supply chains. There will be shortly much more legislation, e.g. around circular economy or labor and chemical conditions – so the group decided to look forward and make already this differentiation into regulated/non regulated.

With an increasing importance of Big Data analyses and Artificial Intelligence technologies as major tool sets (e.g. machine learning, picture recognition and text recognition), the group decided together with AI specialist to make features an own layer within the GTS Data Model.

Learning: A so called Ulster collar has a defined "Ulster" form. Coats with Ulster collars normally are called "Ulster coat" A Trench coat normally does not have an Ulster collar.
We are in a very creative industry though. Is a Trench coat with an Ulster collar still a trench coat? The answer is: it does not matter, because service providers skip the categorization into Ulster coat or Trench coat and base their machine learning algorithms and the related business processes on relevant features below such subclass categorization.
This is the core reason, why the Global Textile Language choose a well-defined and extensive list of features to describe finished products. The other reason is, that we expect the Global Textile Language to be very soon the base to create suggestions for product descriptions also based on machine learnings. First talks with AI specialists showed interesting possibilities for the near future.

6.3.5 TRADING CONDITIONS

Trading conditions in GTS sense are all private/confidential product related data with trade relevance, like e.g. discounts, minimum orders, etc.

As they require special security mechanisms Trade Conditions are a separate layer within the GTS Data Model, aside of product features and Global Textile Language.

6.3.6 DOCUMENTS

Documents, e.g. EUR1, supplier declaration but also certificates are a firm part of daily business life in textile value chains.

Today they create two challenges:

a. If they are needed in paper form, they create manual work, e.g. email and/or phone if they are missing, which is often the case and
b. At least part of the content on the document needs to be processed in IT systems, which results in manual work.

Here is an example from within the project regarding such data from GOTS (Score and Transaction certificates), that have been named as such data, which are maintained today by hand:

	Code	Description	Type	Unit	Unit (imp.)	Value code - Description		
1	1F133001	Certificate type	A			1	1V017001	General certificate (Score)
	1F133002					2	1V017002	Transaction certificate
2	1F133004	Name of certificate	A			1	1V017004	GOTS
3	1F133005	Issuing party	A			1	1V017006	Issuing party
4	1F133007	Licensing code of the certification body	A			1	1V017008	2a) licensing code of the certification body
5	1F133009	Number of certificate	N			1	1V017010	2b) Reference number of the certificate
6	1F133011	Validation date	R	from/to		1	1V017012	Validation date
7	1F133012	Seller name	A			1	1V017014	3.) Seller of the product(s) (name and address)
8	1F133013	Inspection body name	A			1	1V017016	4.) Inspection body (name and address)
9	1F133014	Reference information	A			1	1V017018	10b) Reference information,
10	1F133015	Place of issue	A			1	1V017020	16a.) Place of issue
11	1F133016	Date of issue	A			1	1V017022	16b.) Date of issue

Picture 26: Labor intensive GOTS certificate data, example in GTL format by GCS Consulting GmbH, Munich 2020

As above data are always the same because certificates always look the same, such data are ideal to be exchanged electronically.

6.3.7 SELECTED TRANSACTION DATA

The group is aware, that touching the field of transaction data is sensitive.

Global Textile Scheme wants to complement current PDM-/PLM, ERP-, PIM- and MAM-systems – not compete or replace them!

Therefore, only such Transaction data shall be "selected" to be part of the GTS Data Model, that have across all sectors, end to end system relevance, cannot be synchronized otherwise or only with huge manual efforts.

The core element within this data layer are the demand data, described in chapter 6.2. Instead of synchronizing the data format for demand date exchange in various IT systems (almost impossible), GTS offers the chance to manage such relevant data centrally via GTS-CAT and the interested users.

This GTS Data layer is open for other labor-intensive transaction data, where it makes sense.

6.4 DATAPORTS

We found DataPorts, when we looked for a modern way to send and most importantly "pull" data. DataPorts is a new basis-technology-approach promoted by the Consumer Goods Forum, a group founded by more than 400 CEO's who made "Data" a "CEO topic".

The following text is a 1:1 excerpt from the latest data Port whitepaper by the Consumer Goods Forum you find at https://www.theconsumergoodsforum.com/wp-content/uploads/202004-CGF-E2E-DataPorts-in-Action-Paper.pdf :

"The solutioning question the consumer Goods Forum looks to address with DataPorts is: can AI-enabled federated data sharing via DataPorts provide an opportunity to leapfrog on how product data is exchanged across the whole value chain?

The solution we are looking for needs to provide the lowest cost across the industry, have a very low entry-barrier, must be able to be adopted at global scale, must allow for trusted authentication, be flexible, and provide full freedom of choice regarding commercial service providers.

The key design principles for the DataPort solutioning are:

• Decentralized: Drive peer-to-peer and many-to-many through a simplified & unified client (make the API a commodity).

• Simplified Protocol: Convention based list of business questions for specific relations (ship answers instead of big sets of data).

• Fast Response: Embed flexibility in the design by assuming a dynamic reality of shifting sources and fast increasing data demands.

• All Data: Cover all sources which support business processes and decision-making right from the start, include transactional, financial, environmental, document based and master data from the beginning in the option space.

• Open Standards: Provide basic building blocks as open framework to secure interoperability of individual solutions as well as scalability and frequent re-use of capacity and capability (example: GraphQL/Linux Foundation).

• Eco-system: Encourage open eco-system of competing solutions and service providers to boost commercialization.

• Modular Design: Envision AI/ML, cloud technologies to enable digitally autonomous processes in the value chain machine-to-machine where possible (increase options for automation where it drives value).

• Push & Pull: The new digital economy increases the need to be able to pull data real-time, DataPorts will support both."

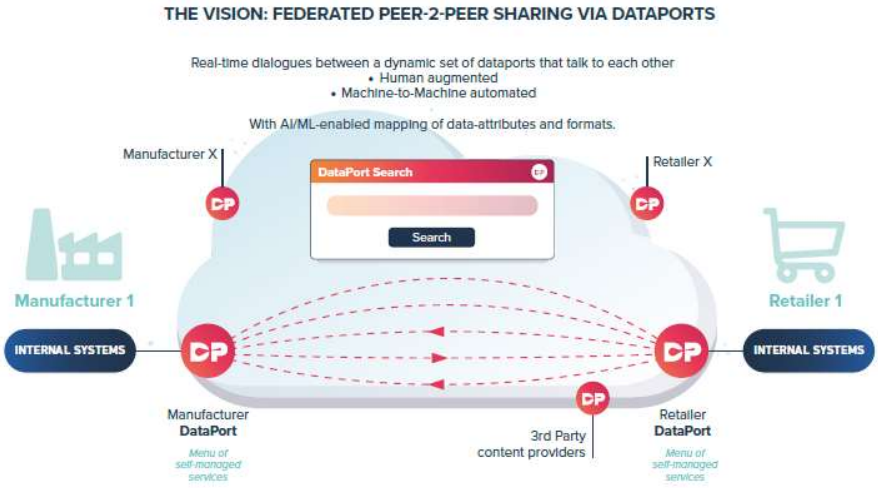
The DataPort data between the DataDocks is transported via DataContainers.

Each DataContainer has a UDCC (Unique Data Container Code, based on UUID) that can be used by the framework to identify a data container.

Any information model can be used (such as Global Textile Scheme, ETIM or Global Data Model)

Any data type (MS Excel, XML or Json) can be used and in any data format: GDSN-CIN, BMEcat, OAGI) or even in a bilaterally agreed format between two parties to support the situation that two parties want to move faster than the market.

The following Picture shows the latest draft (June 2020) of future process steps for data flow with DataPorts.



Picture 27: Vision behind DataPorts from DataPorts in Action White Paper, Consumer Goods Forum, 2020

Data Ports with all the necessary conceptional and technological components is currently (July 2020) developed by SyncForce BV in Eindhoven, NL and as the White Paper mentions the Global Textile Scheme Initiative will be the first global users testing data Ports in a mini pilot that is prepared at the time this document is written.

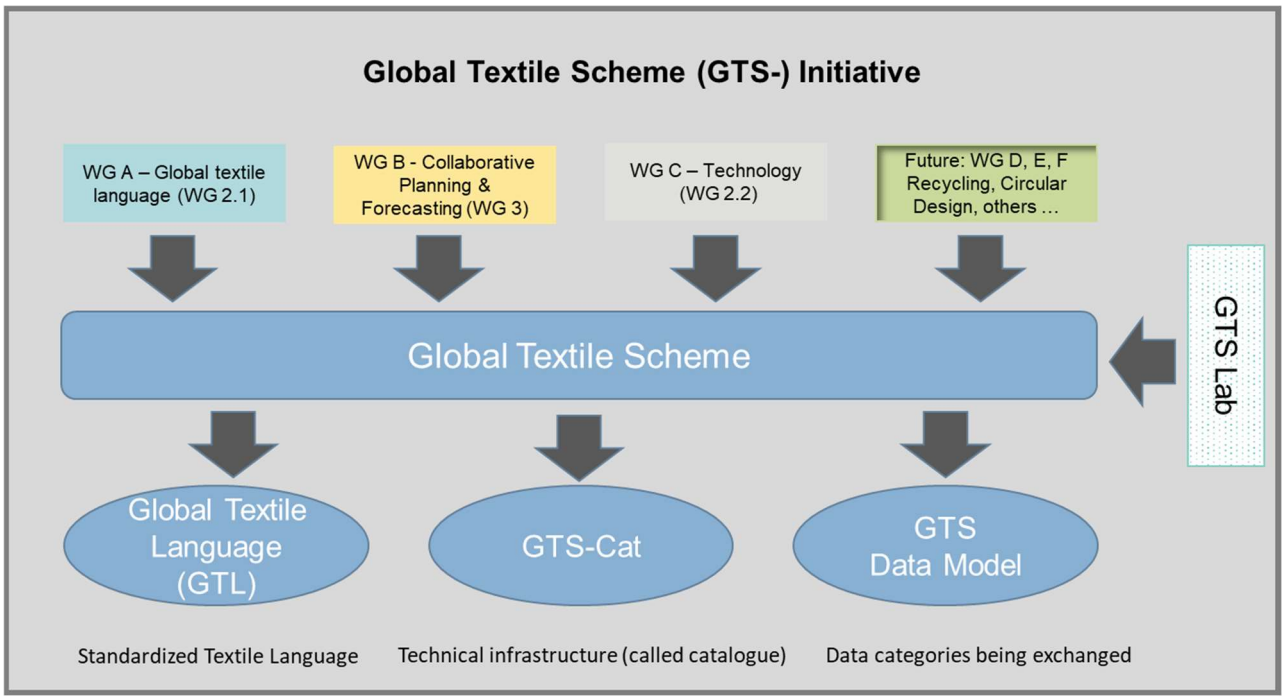
6.5 Global Textile Scheme Initiative

The so-called Global Textile Scheme Initiative is the next step on the members' way to implement the findings described in this document into the real life of the Textile and Fashion sectors.

Our industry will see more and more challenges that can only be addressed across sector borders, e.g. the upcoming and new circular economy legislation addressed by the EU Commission in March 2020.

Therefore, first the Global Textile Scheme Initiative is a frame for interested companies to meet other companies with interest in identical topics and develop collaboratively innovative approaches and new ideas.

As all those cross-sector topics have or will have an impact on data, the second facet of this frame is to develop and later maintain the Global Textile Scheme as shown in the following picture.



Picture 28: Overview of structure and function of the Global Textile Scheme Initiative, GCS Consulting GmbH, Munich 2020

As legislators demand more and more sustainability- and CSR – related transparency from our industries the participants see no alternative to such an integrated approach and foresee new work groups in the near future, working on critical topics like e.g. circular design and/or recycling.

6.5.1 GTS Organization

In October 2020, the visions, methods and approaches of the Global Textile Scheme Initiative attract more than 20 companies from Italy, France and Germany.

In the final meeting of the Pilot Project Data Exchange in July 2020, which was also constitutional meeting for the Global Textile Scheme Initiative all members agreed, that in order to change this, a qualified system head with time, resources and financial interests is needed.

As a result, the group mandated Andreas Schneider from GCS Consulting GmbH to continue immediately and establish a separate legal entity, managed by him in person and capable to manage the initiative full time.

A new Global Textile Scheme UG, located in Dusseldorf, Germany has been established and the group also agreed to start the implementation activities in August 2020 and fund the first 1,5 years with a flat rate based on a defined price list which is among other elements related to each company's annual revenue in 2020 (including Corona damages). This way the founding members have a planning security in 2020 and

2021 and the new Global Textile Scheme UG has investment security as well for the upcoming investments around e.g. the development of the new GTS-Cat technical infrastructure which is not available for free.

6.5.2 GTS-CAT WEBSERVICE DETAILS

One of the core reasons to start the Pilot Project Data Exchange was a high degree of frustration, of exploding interface complexities due to an increasing number of platforms, each with different focus points for a variety of individual challenges.

So what were the reasons for the participants to decide to add an additional platform, which GTS-Cat will be?

The idea developed relatively late and had the major reason, that the Global Textile Language approach only makes sense when many companies really use this new tool. As by far most of the player in the global textile value chains are small companies with limited funds and therefore often limited it infrastructure, the group decided to establish a central database to allow such small companies:

- To participate with as little costs as possible,
- To send data – worst case – with Excel files and
- have one central registry point allowing them to find the other data exchange partners.

The group also decided to establish this new infrastructure as open to other platforms as possible and in cooperation with GermanFashion Modeverband and in the future other Fashion Associations to stay as neutral as possible.

Currently the data and GTS-Cat architecture is under construction, but is will be designed that only parts of the data run through GCS-Cat.

The idea is that anybody needs to register at GTS-Cat and will need to download at least once the GTL attribute list, but then the data exchange process itself can happen through GTS-cat or without, depending on the IT infrastructure of the two data exchanging partners.

The goal, precise focus and the vision of the current founding members is to improve the efficiency of the whole sector plus use less natural resources, by increasing automated data exchange of all reasonable kind within the frame of the Global Textile Scheme Initiative and use GTS-Cat as a tool – not to establish a business to sell data pool and clearing center services.

6.6 RESULTS, LEARNINGS & RECOMMENDATIONS

When the group started nobody would have dreamed about the results and dynamics our Pilot Project developed.

We shared work and funds and the result is that great, that there is a lot of pressure to quickly found the Global Textile Scheme Initiative and implement the Global Textile Scheme as fast as possible.

The goal is to start first exchanges of demand data on a prototype version of GTS-Cat end of 2020 and gradually increase the use of the other GTS-Cat functions, e.g. the download of the Global textile Language attribute list within the first half of 2021.

All members are aware that the work we just start will never end. But all of them also know that if they do not move, they will be moved.

7 OUTLOOK

7.1 TEXTILE SECTOR

In the textile sector we are entering a period, where the consumer determines what the sector needs to do.

Coming from a time where "production prices where king", then "vertical partnerships" and then "products" as differentiation and USP element, we enter a period where only the full range of

- product competence
- plus consumer orientation = production on demand
- plus sustainability
- plus CSR plus
- fulfilling legal requirements will bring long time success.

In combination with frightening global concentration processes the space for small companies to "continuing as usual" will get tighter.

The findings and upcoming possibilities described in this document offer particularly for small and flexible companies significant chances with relatively small investments.

7.2 CSR AND SUSTAINABILITY

Before we enter this subject, it helps to define the following terms:

Traceablity	Transparency	Sustainabilty	Due diligence
Traceability means the ability to track the course, application or location of an object in a supply chain (ISO, 2015). In this context, this is defined as the ability to "identify and track the history, application, location, and distribution of products, parts, and materials to determine the reliability of sustainability claims in the areas: • Human rights, • Work (including ensuring health and safety), • Environment • Fighting corruption (UN Global Compact 2014); • In the process by which companies track materials and products, • Ensure the conditions under which they were manufactured across the supply chain (OECD, 2017)	Transparency refers directly to the relevant information that has been made available to all elements of the value chain in a standardized manner, which enables a common understanding, accessibility, clarity and comparison. (EC 2017).	In this context, sustainability is understood to mean the manufacture, marketing and use of clothing, shoes and accessories as well as their parts and components, taking into account the effects on the environment, health, human rights and socio-economic aspects, as well as their continuous improvement, phases of the product life cycle (UNECE 2018).	Due diligence is an ongoing, proactive and reactive process through which companies can prevent and mitigate adverse effects in terms of human rights, labor rights, environmental protection, bribery and corruption in their own operations and in their supply chains (OECD 2017).

Picture 29: CSR related definitions, GCS Consulting GmbH, Munich 2020

Did you ever wonder, where the data shall come from, in order to fulfil the requirements in the categories defined in above's overview?

For most members fulfilling future CSR- and Sustainability related requirements – but with reasonable efforts = manual work - has the exact priority as increasing their efficiency and reduce sourcing and production lead times.

The current level of mark downs in combination with textile products being burnt, which previously used significant amounts of resources, like e.g. water (often in countries with limited water supply) will not be the future of our industry.

Establishing the Global Textile Scheme is based on the idea of collaboration in non-value creating = non-competition critical areas.

Its potential to save significantly cost will be a game changer - in efficiency, time to market speed and saving resources.

7.3 RECYCLING

Due to the Circular Economy Action Plan of the EU Commission from March 2020 "Textiles are the fourth highest-pressure category for the use of primary raw materials and water, after food, housing and transport, and fifth for GHG emissions. It is estimated that less than 1% of all textiles worldwide are recycled into new textiles".

Please allow me to repeat the same core question: where shall the necessary data come from?

There will be a "time after Covid-19" and you don't need to be a prophet to realize that the way the textile sector practices its business needs to change and will change because we are running fast into a global competition for water – just to name one major global challenge.

For this exact reason the GTS Data Model has one specific data layer within the features solely covering data around sustainability and corporate social responsibility which can be adapted in the future to the needs of the sectors due to the dynamic character of the GTS Data Model.

When additional legislation requirements by the EU Commission will find it's ways in national law even small companies will be prepared because the Global Textile Scheme offers from the data side the necessary tool sets to fulfil the requirements when they come.

7.4 DIGITAL MATERIAL PARAMETER COMMUNICATION

Speed to market will be one of the main changing areas a) to fulfil consumer needs and b) to reduce mark downs and obsolete over-production.

Digital material parameter communication (including digital color) will be one of the key influencing factors to save resources and non-value creating costs and to allow virtual products that will increase dramatically in importance.

Hugo Boss AG is one of the first major player defining their requirements in a separate document called "digital ready" which has in our opinion the potential to become an industry standard as Hugo Boss AG is leading in virtual product development and due to the size of their sourcing networks.

7.5 COLLABORATIVE PLANNING & FORECASTING

Collaboration will be the next major game changer.

Today the upstream part of the textile value chains is facing similar challenges and developments like vertical partnerships in the 2000er years, offering the same benefits as between collaborating brands and retailers.

The Global Textile Scheme Initiative offers the operative environment and framework for the necessary:

- cultural changes,
- work groups,
- joint language and semantics and
- technology tools.

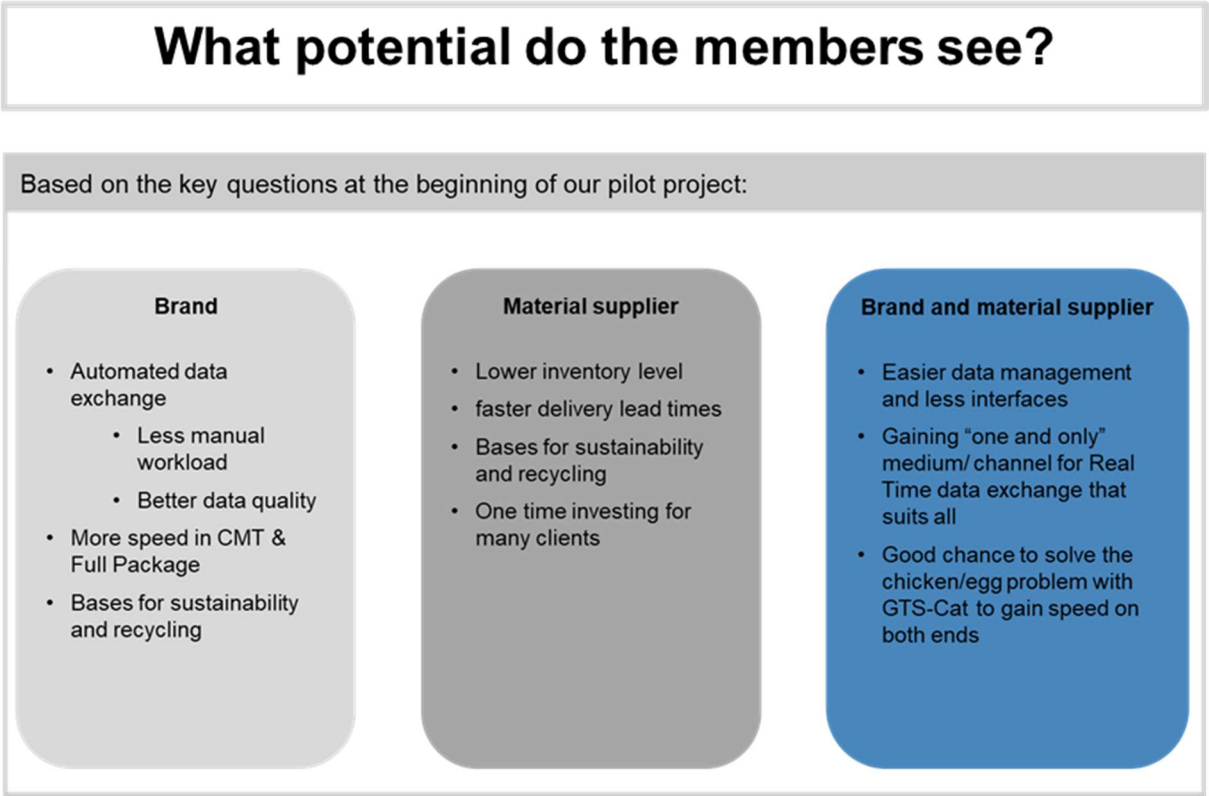
Most members of the Collaborative Planning and Forecasting work group demanded additional continuing activities - as many facets for efficient collaboration left open and still need to be worked on.

The fact that very soon suppliers of all sorts, registered at GTS-Cat have a fair chance to determine how the demand of their products is developing at their clients will be a major driver to totally new ways of making textile business in the near future as the benefits are self-explaining and breath taking!

7.6 GTS – PRINCIPLES, ORGANIZATION

Global Textile Scheme is a new way of working in the global textile and fashion sectors. It is the frame to develop what is missing and implement what is there.

The founding members invested quite some money and time in the Pilot Project Data Exchange and now into the Global Textile Scheme Initiative, because they strongly believe, that continuing with "business as usual" after the Corona crisis will not be an option and if the share the costs for the necessary infrastructure on an abstract base they can harvest the following benefits:



Picture 30: Pilot Project Data Exchange - milestones reached, Newsletter Article from GermanFashion Modeverband e.V, July 2020.

7.7 NEXT STEPS

In August 2020 the Global Textile Scheme Initiative started and Global Textile Scheme UG (later GmbH) was founded.

GCS Consulting GmbH will be an initiating partner, as Global Textile Scheme UG (later GmbH) needs a bit of time to establish the operational infrastructure.

The kickoff meeting of the Global Textile Scheme Initiative was held on the 11th of September 2020 at Freudenberg Performance Materials Apparel SE & Co. KG in Weinheim, Germany.

GermanFashion Modeverband Deutschland e.V. in Cologne, Germany has committed itself as cooperation partner – talks with other major Fashion Associations are ongoing.

If you have any questions or are interested in joining the Global Textile Scheme Initiative, please contact:

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THANKSGIVING NOTE

A big thank you to all the members of this pilot project, who had the courage to trust their vision, the group and the moderators, not knowing where this journey would lead us to and invested money and time with passion and devotion, knowing that we could fail.

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8 PICTURES