

**77th Plenary Meeting of the
International Cotton Advisory Committee
Abidjan, Côte d'Ivoire**

Third breakout session

**Producing Fiber Quality
that Spinners Desire:
a look from the final consumer side**

Jean-Paul Gourlot and Bruno Bachelier

December 2-7, 2018



What does a spinner want?

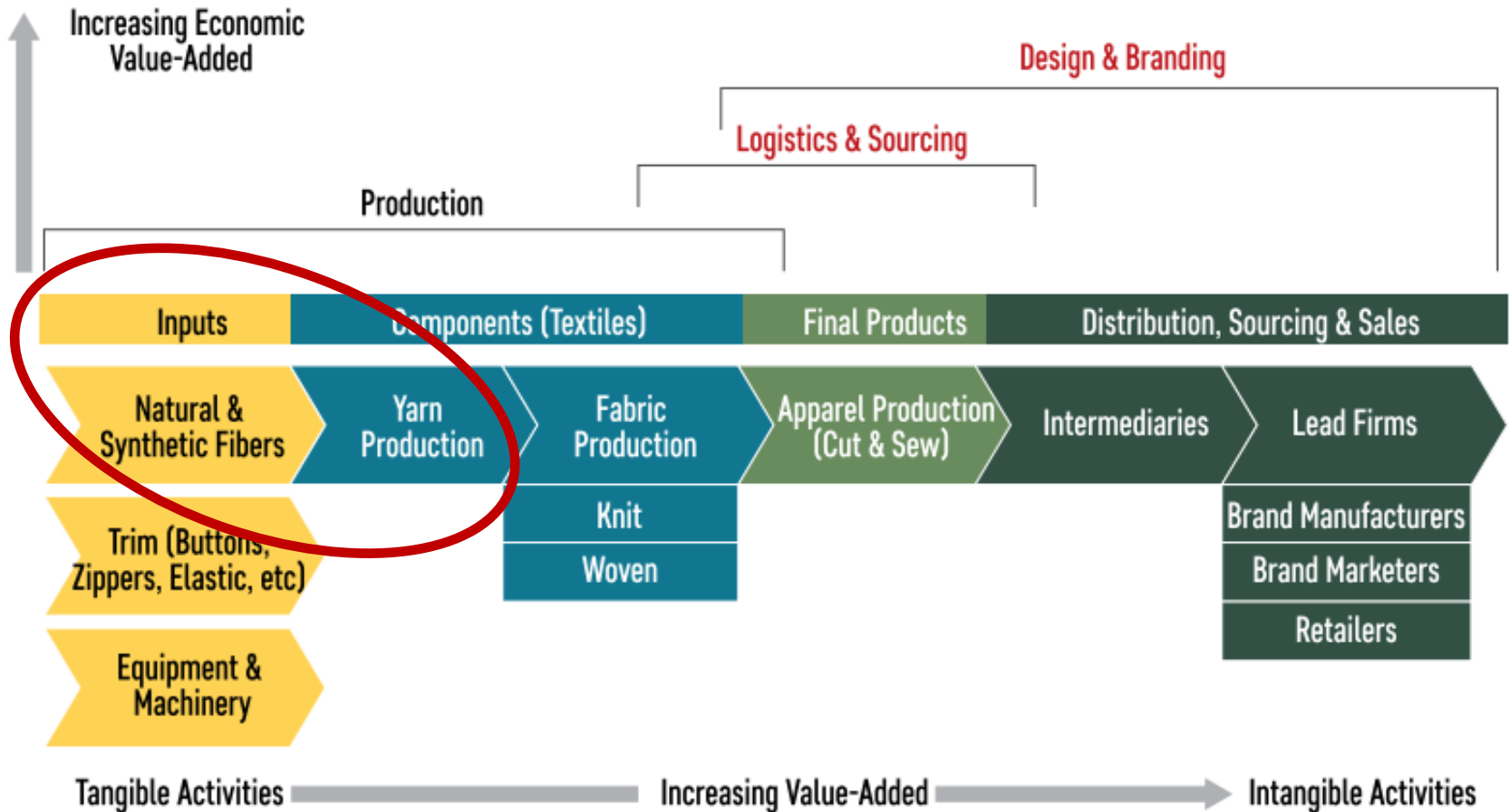
- Satisfy his customers...
- ... For satisfying his customer's customers
- ... For satisfying final customer's needs

⇒ What is the market?

Content: Observation from the final users upstream to the fibers, operation per operation

Worldwide textile and footwear market

FIGURE 2: Structure of the global value chain for apparel

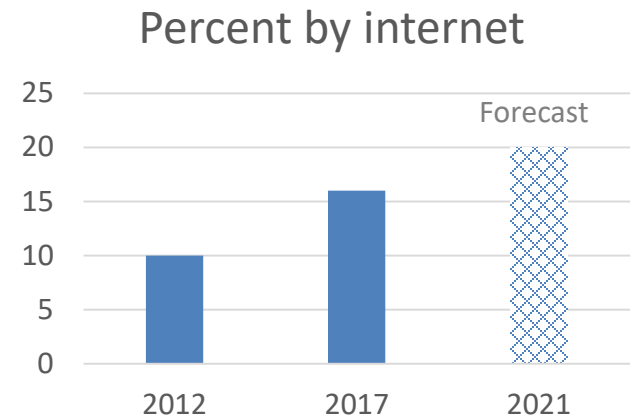
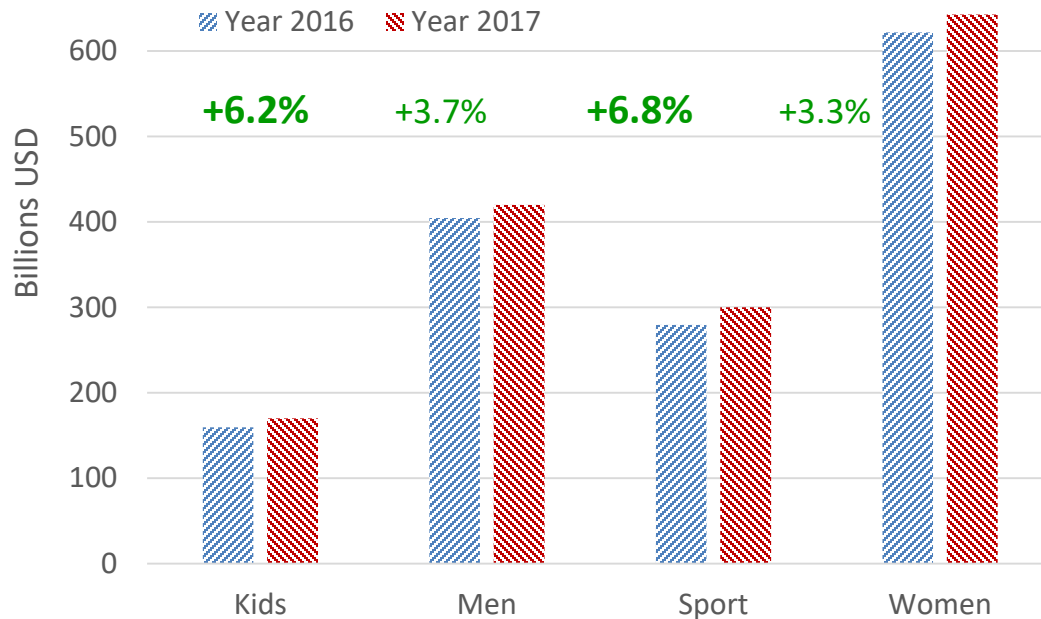


Activities in red indicate highest value added activities + control/power over the chain

Source: *Stitches to Riches?*

Worldwide textile and footwear market

- +4% in 2017
- 1700 billions USD in 2017 (1200 billions USD textiles only)



- 50 billions USD in 2017 for cotton fibers alone

Worldwide textile and footwear market

Sticky notes

- Kids, men, sport, women

Sticky notes

- Kids, men, sport, women
- Production scheme
 - More concentration in 2011 than in 2005 (and more now)
 - 58% made by 10 countries in 2011
- Consumption
 - 78% consumed by top 3 consumers EU, USA, Japan
("requirements are more elaborate, detailed, and difficult to comply with in developed countries" (Fukunishi, 2013))

=> What are the criterion to feed the market?

What about 'quality' expectations?

Sticky notes

- Kids, men, sport, women
- EU, USA, Japan (“requirements are more elaborate, detailed, and difficult to comply with in developed countries” (Fukunishi, 2013))



What about 'quality' expectations? Garments

Sticky notes

- Kids, men, sport, women
- EU, USA, Japan (“requirements are more elaborate, detailed, and difficult to comply with in developed countries” (Fukunishi, 2013))
- Expected 'quality' criterion
 - Difficult to find (free) information
 - Nice fit (85% of internet purchase returns!), style and comfort
 - Strength, dimensional stability of fabrics, abrasion and pilling resistance, colorfastness (light and washing)
 - Consistent 'quality'

=> How does this transfer to expected 'fabric quality' parameters?

What about 'quality' expectations?

Product properties and customer perception:

=> **results of an interaction**

- Price, care ...
- Marketing conditions
- Product characteristics or properties
- Customer culture, education, ..., living conditions
- Apparel production
- Fabric finishing
- Fabric production
- Yarn production
- Fiber properties

What about 'quality' expectations?

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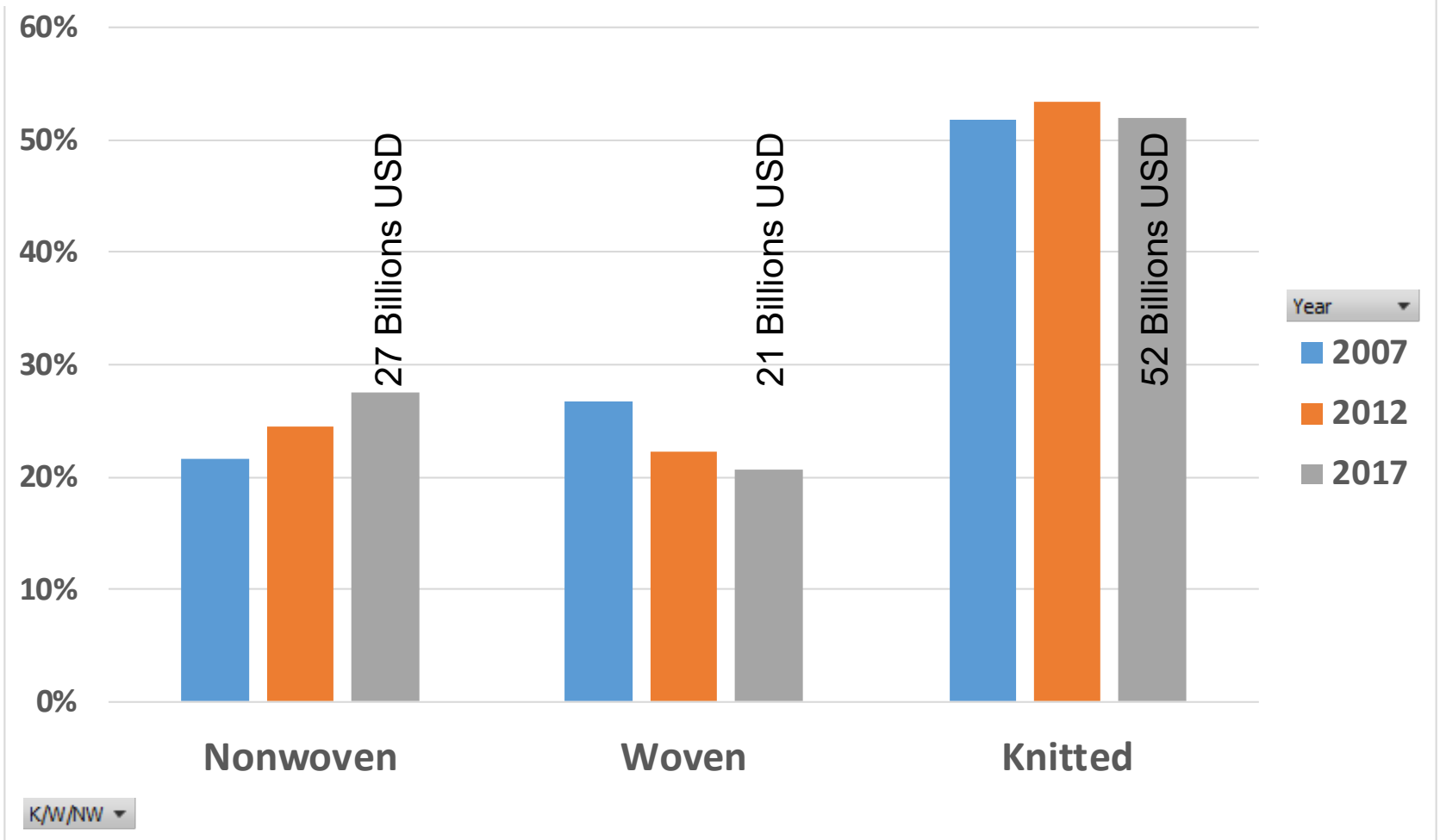
What about 'quality' expectations? Fabrics

Worldwide share of fabric's values by fabric type (%)

What about 'quality' expectations?

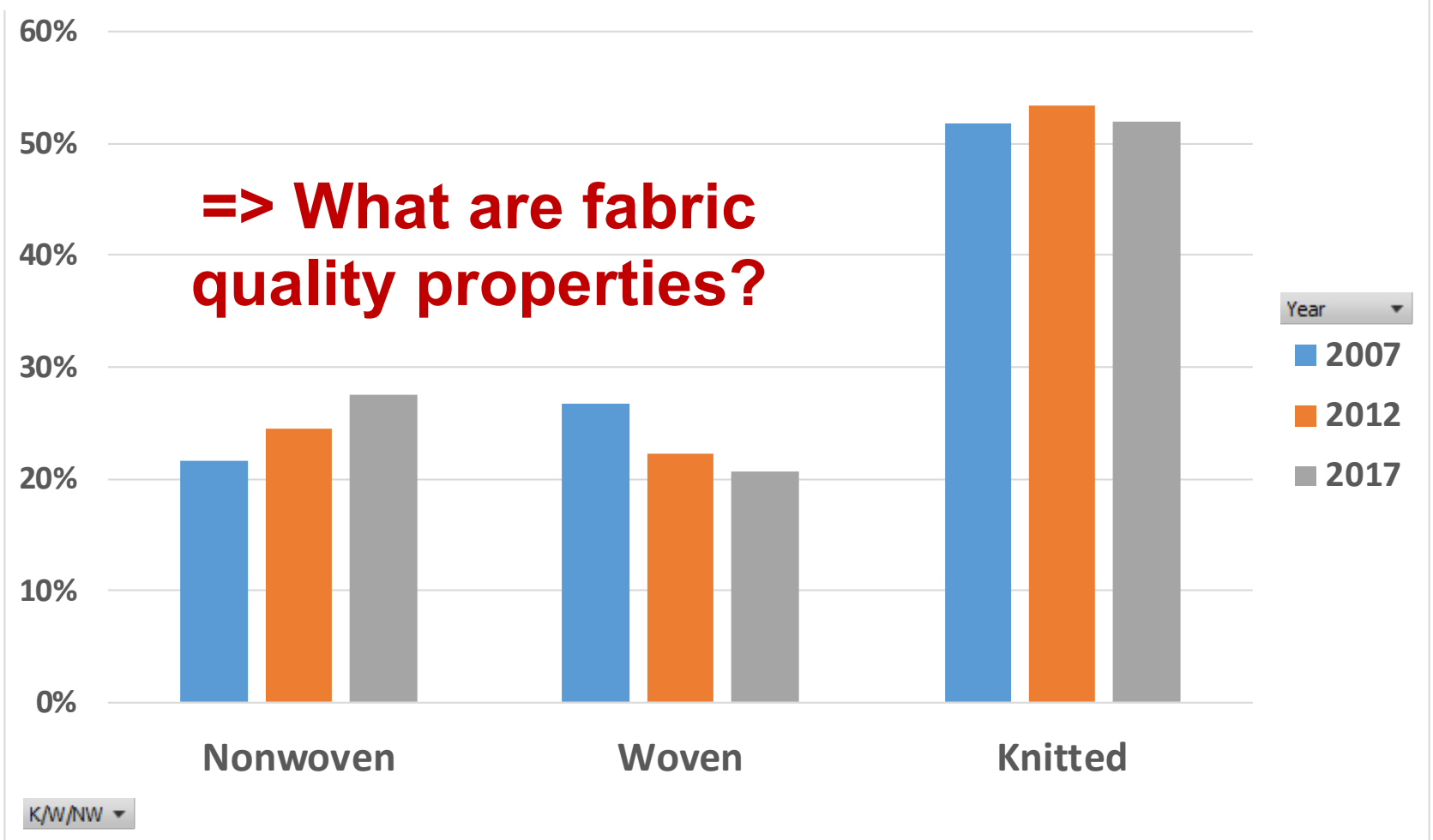
Fabrics

Worldwide share of fabric's values by fabric type (%)



What about 'quality' expectations? Fabrics

Worldwide share of fabric's values by fabric type (%)



What about 'quality' expectations?

Fabrics

- Material shares
 - Density and structure
 - Cover factor, dynamometric properties, drapé, dimensional stability, pilling and abrasion properties, softness, stiffness, moisture and water sorption, desorption and permeability, crease resistance, color stability ... (mean and variability)
 - Productivity, price and availability
- => How does this transfer to expected 'yarn quality' parameters?**

What about 'quality' expectations?

Yarns

World	OE	RS short staple
Nb spinning positions Resp. %	8 065 601 3%	243 491 864 97%
Production / spinning positions (m/mn)	300	25
Mean tex (g/1000m)	40 (Ne 15)	20 (Ne 30)
Production (1000km/mn) Resp. %	2 420 28%	6 087 72%
Production (kg/spinning position/year)	6307	263
Production (t/mn) Resp. %	97 44	122 56

What about 'quality' expectations? Yarns

- Making: RS, OE, Compact, combed yarns?
- Abrasion, Count, CSP, Defects, Elongation, Evenness, Friction, Hairiness, Imperfection content, Lea strength, Moisture regain, Strength, Twist... (mean and variability)
- Productivity, price and availability
 - => How does this transfer to expected 'fiber quality' parameters?**

What about 'quality' expectations? Fibers

Industrial spinning: yarn strength depends on:

Rank	Open end	RS
1	Strength	Length
2	Fineness	Strength
3	Length	Fineness
4	Trash	Trash

Deussen, 1992

Research: RS 20 tex (191 cottons) yarn strength

$$\begin{aligned}
 \text{YS} = & 0.44 \text{ Strength} - 0.0016 \text{ Fineness} \\
 & + 2.58 \text{ Maturity} + 0.33 \text{ Length Uniformity} - 27.03 \\
 & R^2 = 0.76 \text{ ***}
 \end{aligned}$$

Frydrych R. & Gourlot J.-P., 2000

What about 'quality' expectations? Fibers

Sticky notes

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 - Nice fit (85% of internet purchase returns!), style and comfort
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 - Consistent 'quality'
 - Made from knitted, woven and non-woven fabrics
 - Commercial fiber characteristics

What about 'quality' expectations?

Conclusions

Products

10 000s

Fabrics

1 000s

Yarns

100s

Fibers

100s

What about 'quality' expectations?

Fabrication parameters

Making: weaving, knitting, finishing, ...
Parameters: pattern, density, yarns, materials, speed, technique, chemicals...
Incidence: costs, productivity, ...

Making: RS, OE, Compact...
Parameters: combing, blends, origins, know-how, twist, materials, speed, technique, ...
Incidence: costs, productivity, ...

Fabrics

Aesthetics

- Cover factor •
- Crease resistance •
- Dimensional stability •
- Drape •
- Stain resistance •
- Stiffness •

Comfort

- Air and water permeability •
- Breathability •
- Fabric touch and hand •
- Stretch and recovery •
- Thermal insulation •
- Thermal regulation •
- Water proof •
- Water repellent •

Durability

- Surface friction •
- Tearing strength •
- Tensile strength •

Maintenance

- Color: light resistance •
- Color: perspiration resistance •
- Color: rubbing resistance •
- Color: washing resistance •
- Storage: resistance to moths •
- Storage: resistance to stain •

Yarns

- Abrasion •
- Count •
- CSP •
- Defects •
- Elongation •
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- Hairiness •
- Imperfection content •
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Fibers

- **Color**
- Fineness
- Foreign materials
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- **Length**
- Length distribution
- **Length uniformity**
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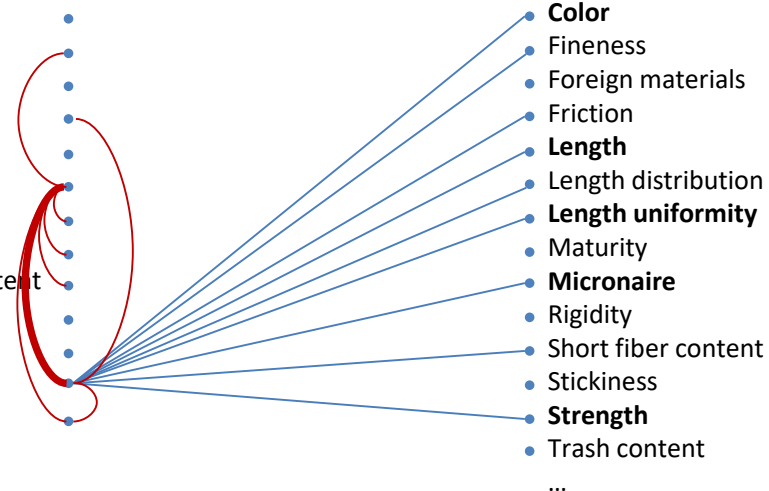
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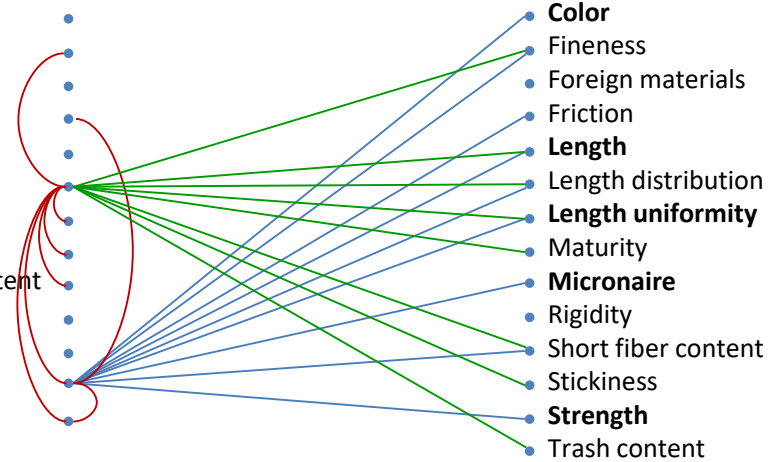
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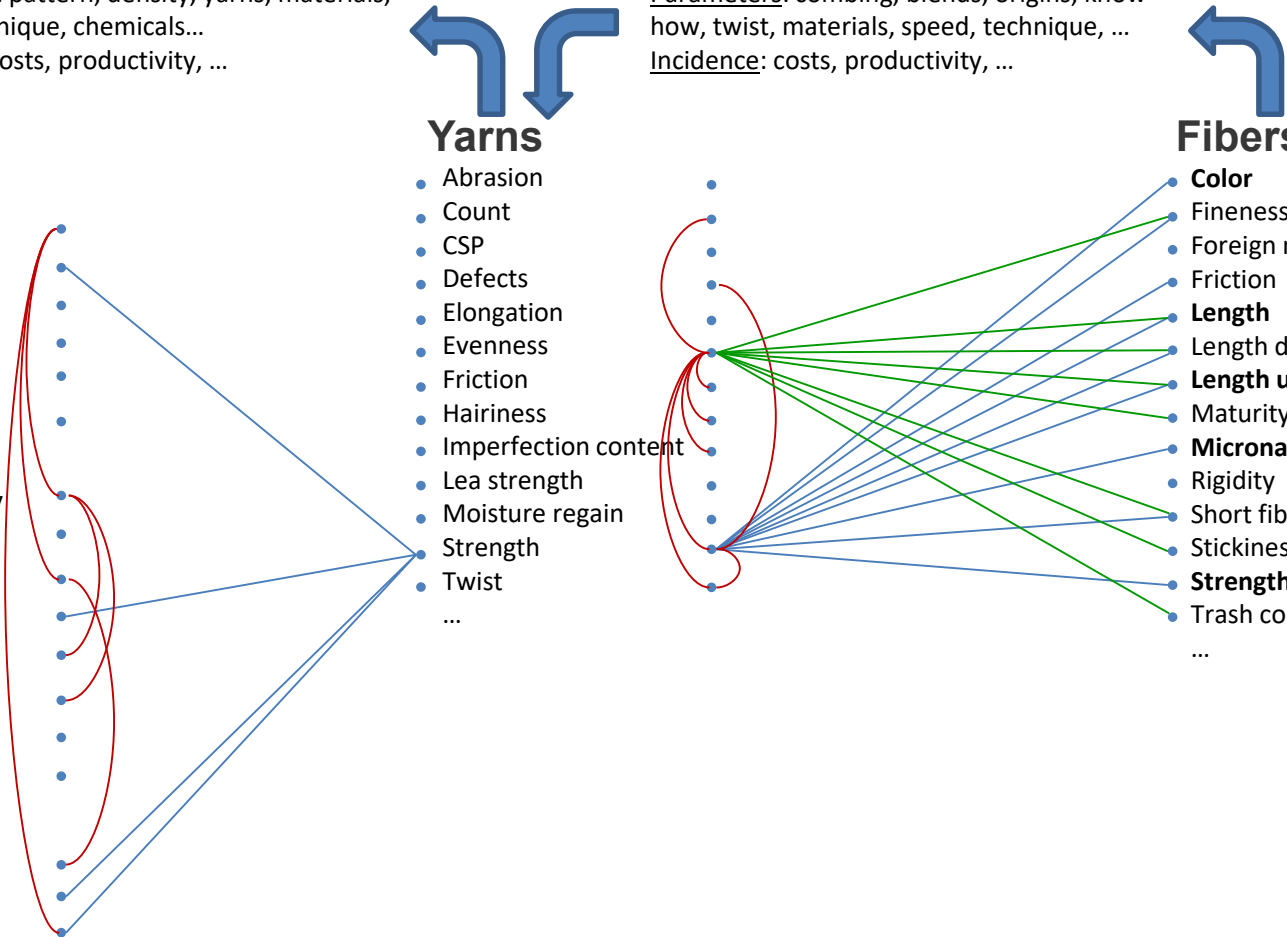
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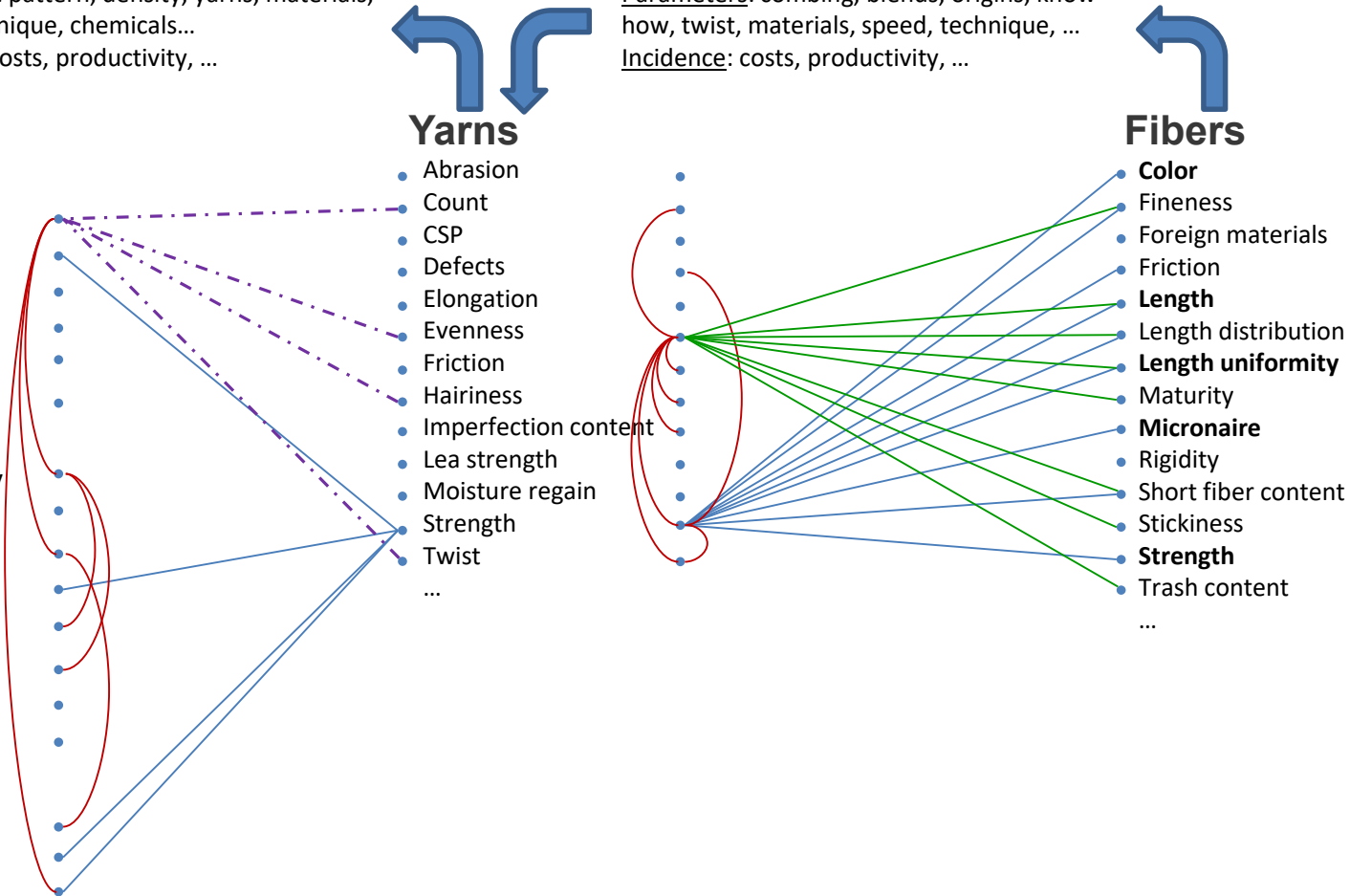
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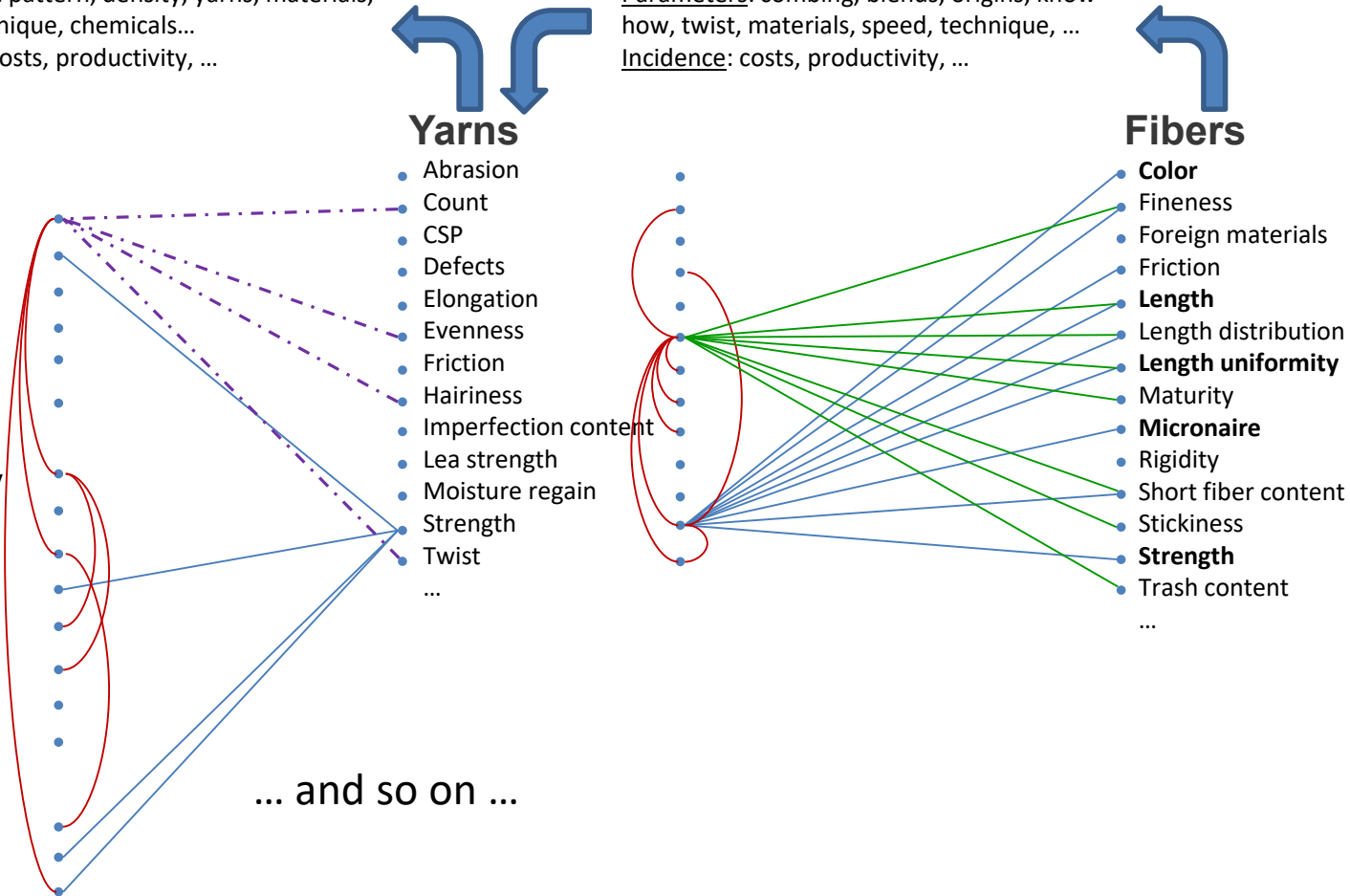
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Classing facilities

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