

The breakthrough of innovative Information and Communication Technologies (ICT) applied to textile

José Antonio Tornero
Research Manager
Innotex Center – Intexter (UPC)



Introducing INNOTEX Center



The textile research unit of the UPC

www.upc.edu/intexter



Introducing ICT

- ▶ **TIC comprises:**

- ▶ Telecommunications
- ▶ Computing devices
- ▶ Software
- ▶ Middleware
- ▶ Data Storage
- ▶ Audio-visual systems

- ▶ **TIC enable users to:**

- ▶ Access,
 - ▶ Store,
 - ▶ Transmit,
 - ▶ And Manipulate
- Information**

Ok, but these points were valid 10 years ago, too
what has changed?



What is happening with the ICT?

Internet is wonderful but, as you know, in the last few years:

- Computing devices have become SMALL
- Computing devices have become FAST!
- Storage capabilities have multiplied
- Visualization devices are catching printing devices
- Communication is fast and wireless

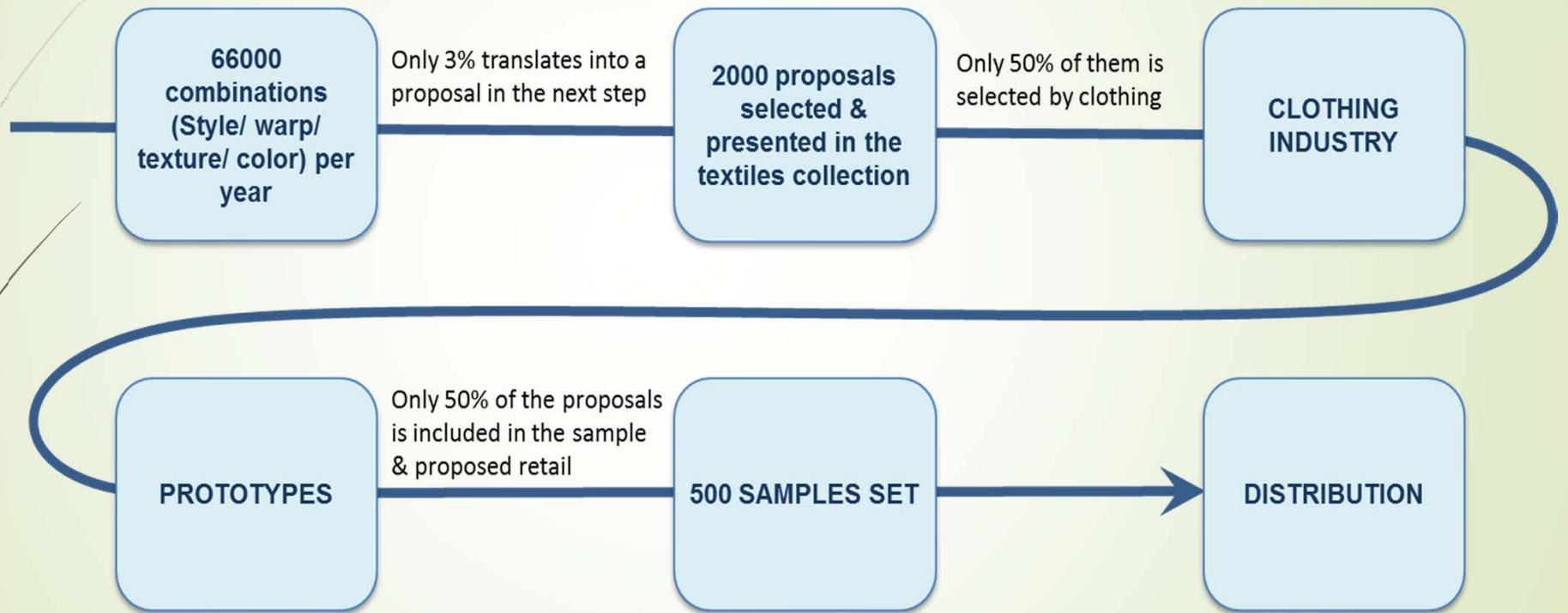
- It's easy to do quick, funny things, but sometimes the development can become very complicate (and interdisciplinary)



The new (and continuously improving) capabilities of ICT offer amazing possibilities to textiles, let's see three examples:

- ▶ Involving computing power and internet
- ▶ Involving visualization
- ▶ Involving computing power, storage and Artificial Intelligence

Sample 1: Project SoMatch



Path for design proposals in T/C sector



Sample 1: Project SoMatch

The incidence of design and product development of an average clothing company, including all direct costs, indirect and selling stocks, states around an **average value between 6 and 7% of its global turnover**

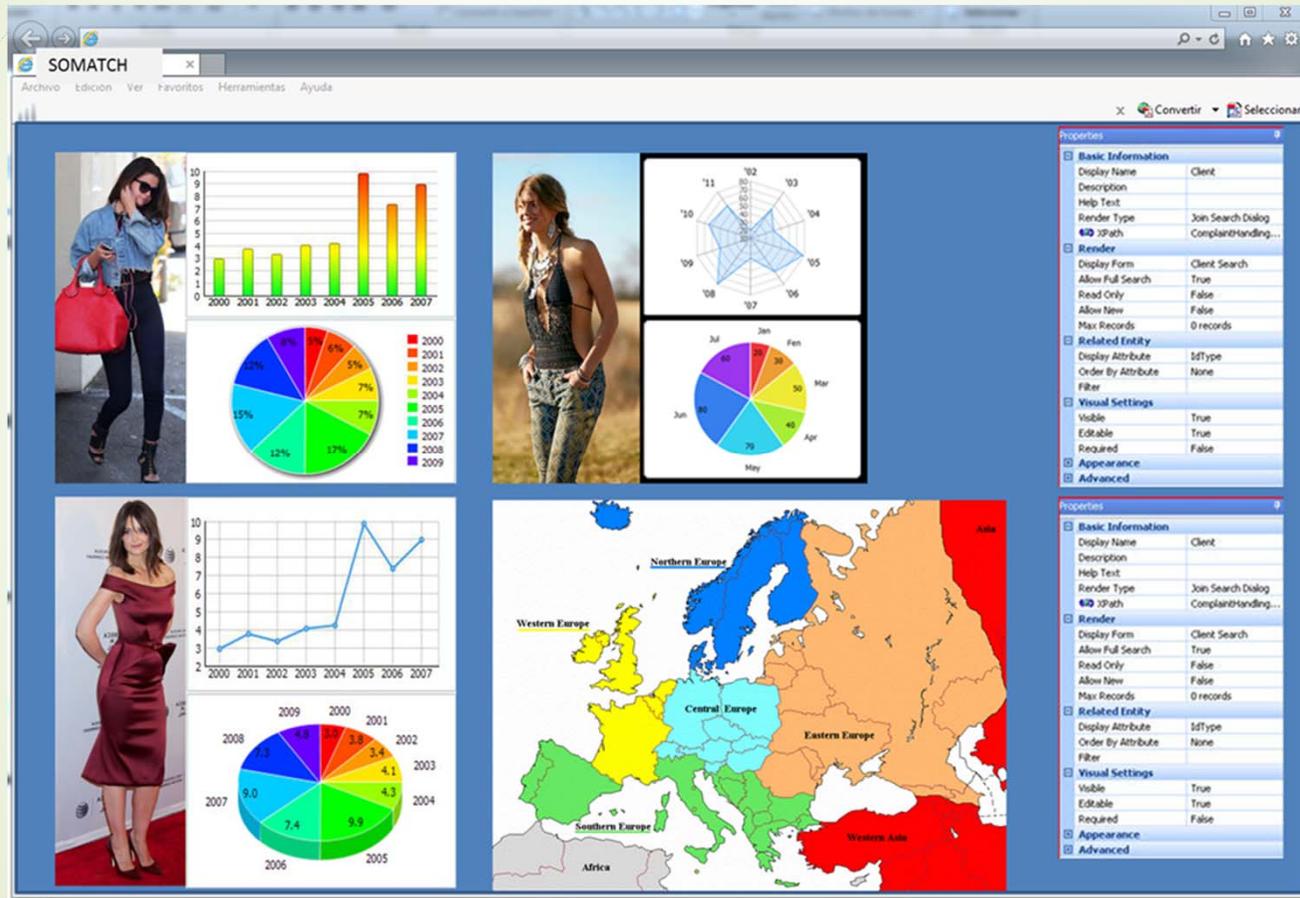
(Source: Hermes Lab)

Sample 1: Project SoMatch

The image displays four fashion items, each with a set of metadata tags. The items are: a teal lace short dress, a grey t-shirt, a red blouse, and a black suit. The tags are organized into lists for each item, with some items having multiple labels above and below them.

- Short Dress (Teal):**
 - no sleeves
 - teal
 - pastel
 - female
 - lace
 - ruffled
 - spring
 - tribal
- T-Shirt (Grey):**
 - short sleeves
 - grey
 - bfw
 - male
 - cotton
 - knitted
 - 60's
 - zebra
- Blouse (Red):**
 - short sleeves
 - red
 - pastel
 - female
 - silk
 - wrinkled
 - romantic
 - print
- Suit (Black):**
 - long sleeves
 - black
 - bfw
 - male
 - wool
 - wrinkled
 - wedding
 - pinstripes

Sample 1: Project SoMatch



Sample 1: Project SoMatch

Project coordination and development of part of the software

Development the image analysis algorithms

Develops social networks data relevance analysis systems

Assessment on system requirements and test of the System
(from fashion designer point of view)

Main software developer

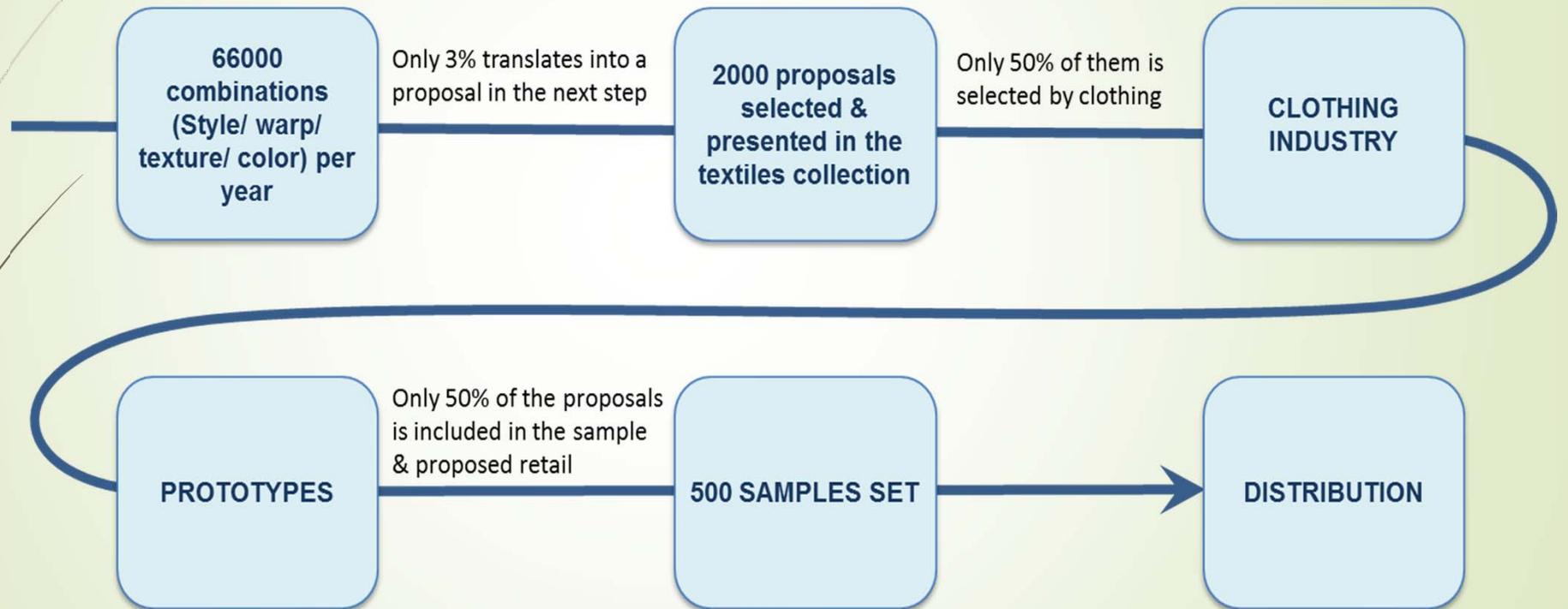
Development of fitting analysis system

Assessment on system requirements and test of the final system
(from e-communities point of view)

Assessment on system requirements and test of the final system
(from e-commerce point of view)

Sample 2: New visualization devices

Coming back to this problem:



Sample 2: New visualization devices

- Until 3 years ago displays could reach 96 dpi (dots per inch)
- Any object or detail below 1 mm will be barely represented in the screen
- Anything below 0,26 mm will not be represented



Sample 2: New visualization devices

- Current displays reach 400 dpi (dots per inch)
- One single cotton fibre will have 2-4 pixels to be represented
- This resolution was just available with printers, but printers are slow





Sample 2: New visualization devices

- Realistic display simulation of fabrics and clothing is possible
- But it needs:
 - High storage capabilities
 - High computing power
 - High communication speed
 - Software considering all these points



Sample 2: New visualization devices

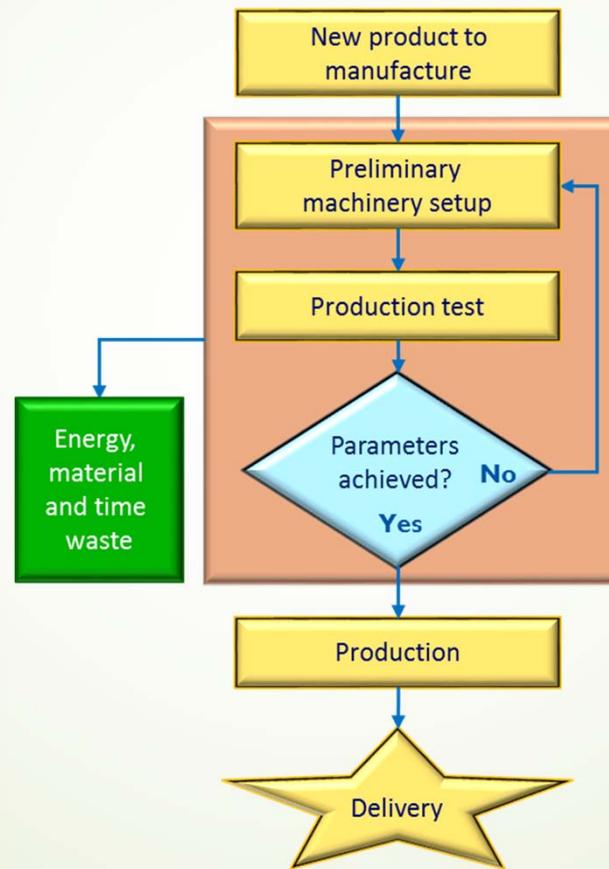
- Products in the market:
- INFOTEX' Penelope
- We must trust in Moore's Law when developing



Sample 3: Computing power and A.I.

- Modern textile factories use modern machinery in their processes
- **Lots of adjustments** are possible
- **Optimum** performance and product quality is **difficult to reach**
- Often process performance is highly **dependant on personal expertise**
- **Personal expertise can be eventually lost** between generations

Sample 3: Computing power and A.I.





Sample 3: Computing power and A.I.

Why do we need many test iterations?

- The process and product experts remember past cases, but it is impossible to keep all the details in mind
- If previous processes/products are documented (luckily), extracting trends from them is not easy

Looks like a ICT problem, but take a look to a real case:

- A big company working with more than 1000 process variations per year
- Each process configured with more than 150 variables



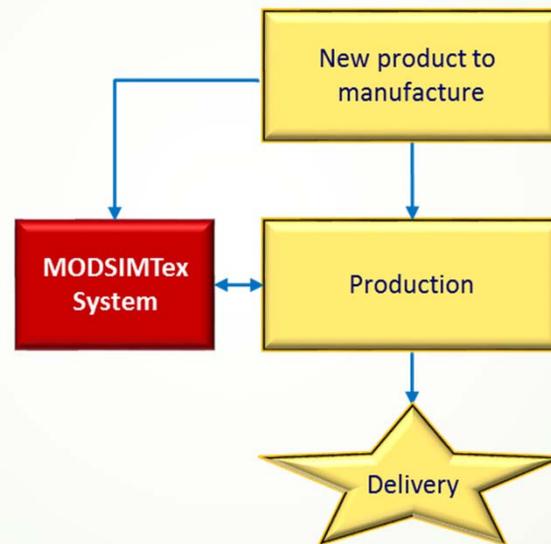
Sample 3: Computing power and A.I.

Project under development:

Combination of

- DataBase
 - Artificial Intelligence
 - Communication across the value chain
-
- **Tries to simulate the behaviour of human process designers, but extracting detailed trends and unveiling hidden knowledge**

Sample 3: Computing power and A.I.





“The question is not if machines will be able to think as an human being, the question is when they will. When you accept this fact then you believe in progress”

Douglas Coupland



Thank you for your attention

