FFD
FUTURE FASHION DESIGN

Real-time, Accurate Fabric to Garment Virtual Prototyping in Collaborative Environments

Terrific Workshop
back-to-back to the WMF
30 June 2014

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Collaborative, Real-time Virtual Prototyping for the Garment Industry

Textile/Clothing characteristics

- *Very **fast product renewal**: 2 seasons, 2 markets (mens, womens)*
- ***Short** product **lifecycle**: 6 months*
- *Long production cycle: more than **70 steps***
- ***Unpredictable demand**: impossibility to produce on forecast basis*
- ***Pressure on product proposal enlargment** and product differenciation on high end market (the only one still produced in EU)*
- *Long **product development timing** (up to 18-20 months)*
- ***Low success rate of design proposal** (in some cases **less than 3%**)*
- *Significant and increasing **costs of product development** (6-7% of the total turnover)*

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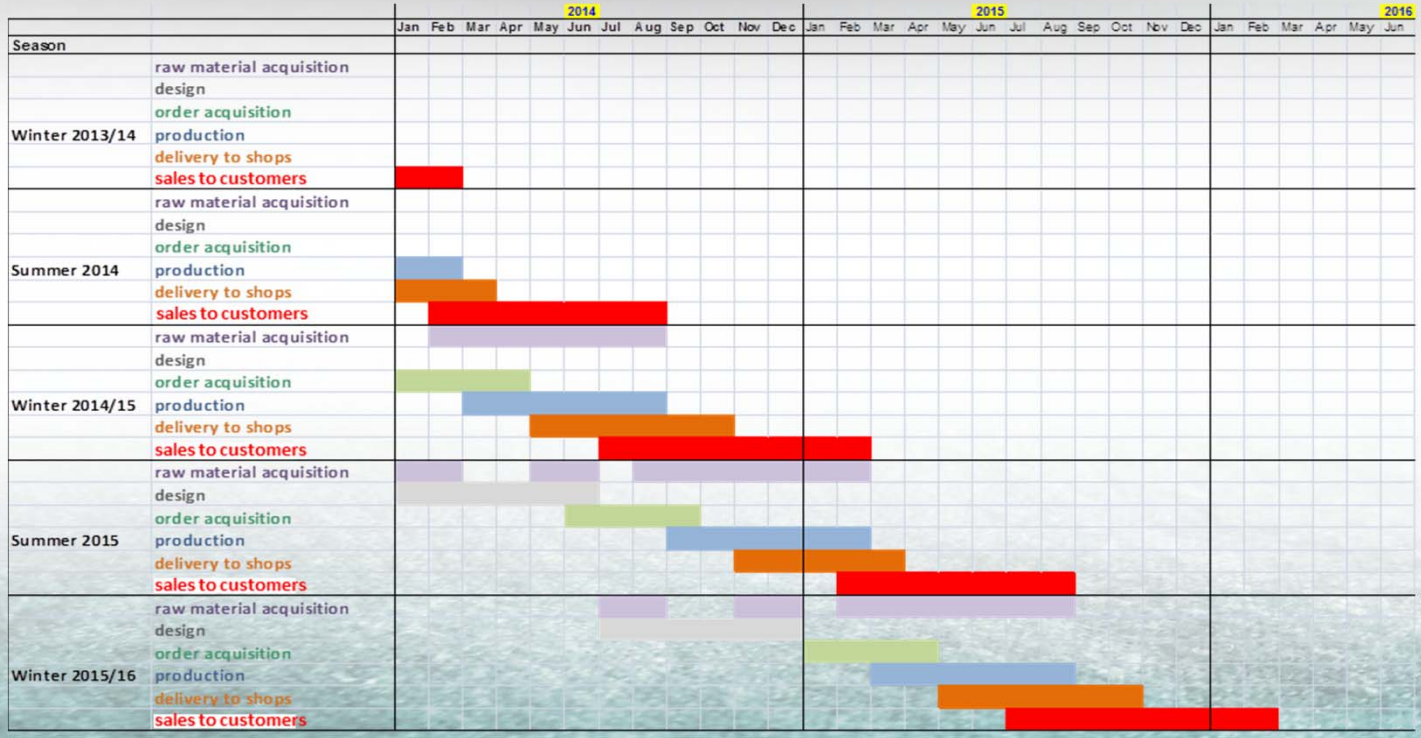
Collection Development Process



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Our Vision

- *VP too complex to generate benefit*
- *VP introduces complex links between physical and virtual world*

FFD Solution

- **Less physical prototypes, less costly process.**
- **Virtual, agile process & control**
- **Less physical links between virtual and physical world**
- **Less complexity in the usage**

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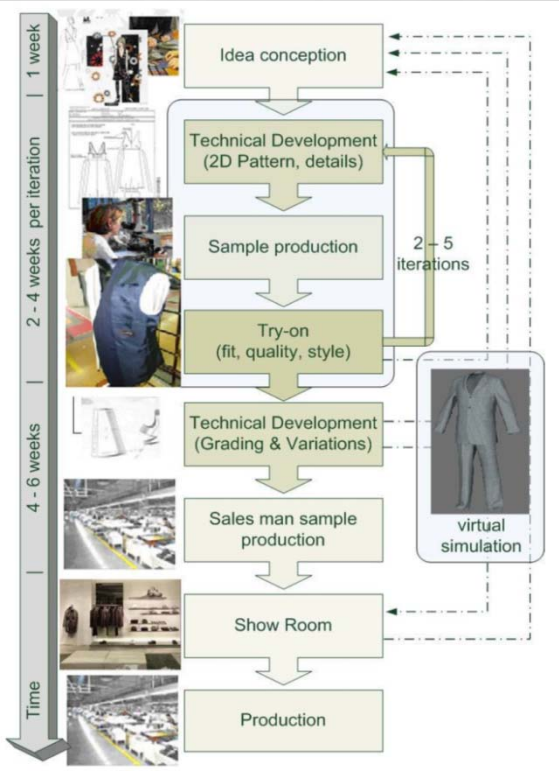
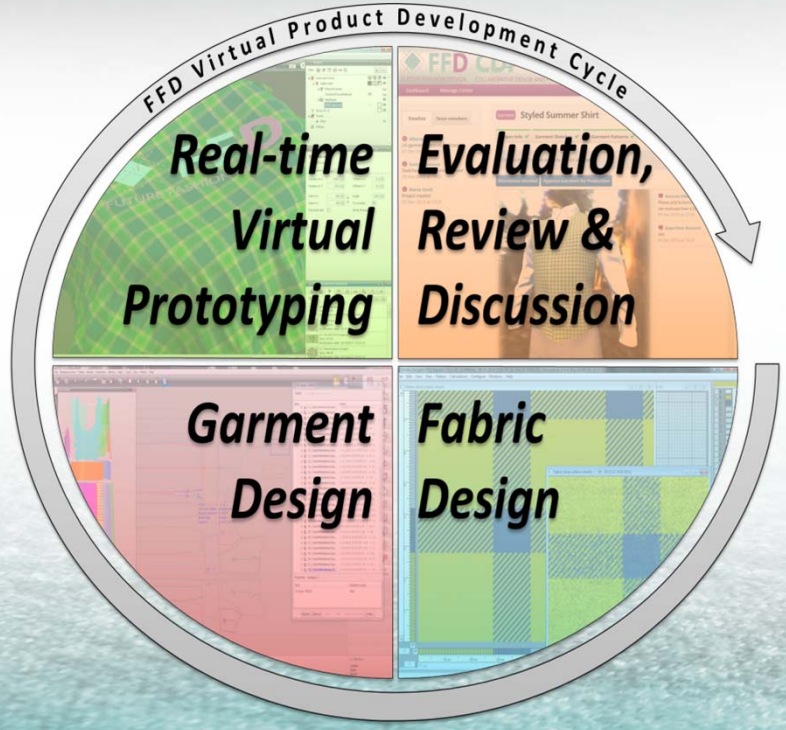
Introduction of a New Design Process





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Fabric virtual simulation criticalities

Fabric design is a mix of 3 main components:

- ***Raw material choice***
- ***Warp and weft combination***
- ***Finishing effects.***

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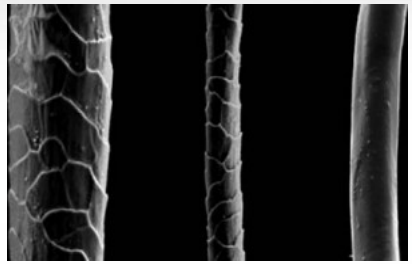
Fabric virtual simulation criticalities

Raw material choice

- It is the key element defining the quality of the fabric.
- Selection of high quality fibers directly on the production markets is critical to keep the quality of the product at the level requested by EU fashion clothing industry.
- The right melting of fibers of different sources (cashmere, wool, silk, cotton, mohair, alpaca only to name the most common) is a key competition element to provide the right product proposal.



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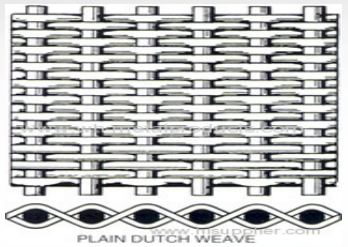
Fabric virtual simulation criticalities

Warp and weft combination

- fabric proposal is the result of the mix of creativity and industrial design. The optical effects are obtained by the combination of warp and weft yarns and by their crossing rules.
- This process is actually performed by textile CAD system, which is able to provide a good preview of the expected effects.
- As regards summer and light weight fabrics CAD representation can reach a high quality while it is still under development as regards winter fabrics, where finishing process provides a radical transformation of the fabric surface and touch



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Fabric virtual simulation criticalities

Finishing effects

- The typical touch of fabric is given by the finishing process. It is obtained by more than 30 production steps, which can be grouped in 3 main phases: shrinking, raising and cutting
- While the correct representation of fabrics with no finishing process has reached a good quality level and the rules to give a virtual anticipation of the aspect of the product from Cad information are clear, different is the case of those ones subject to heavy finishing processes
- In this case the mathematical relationship between the sequence of the machineries and their set up and the optical effect will require further investigation

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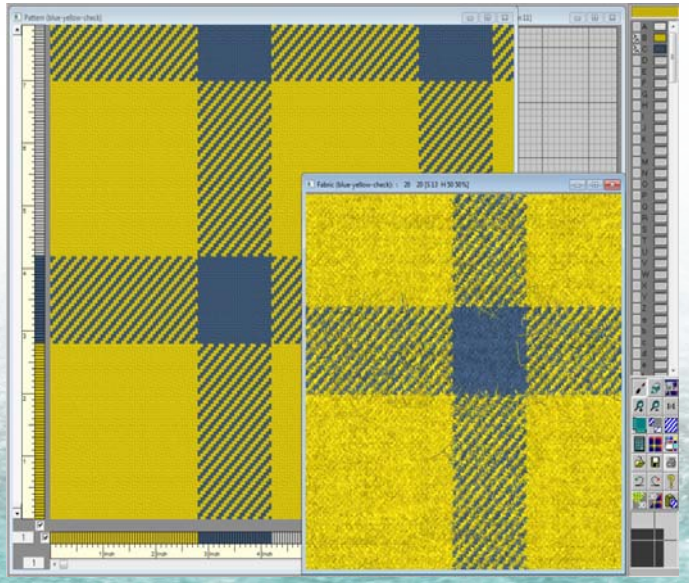
VP – Finishing effects

- At present this process is performed by post production effect, which try to reproduce the typical surface effect of the finishing process

- The scanning solution is a partially satisfying answer since it still requires a physical production of the fabric to be scanned and is not able to provide a 3D visual effect rendering



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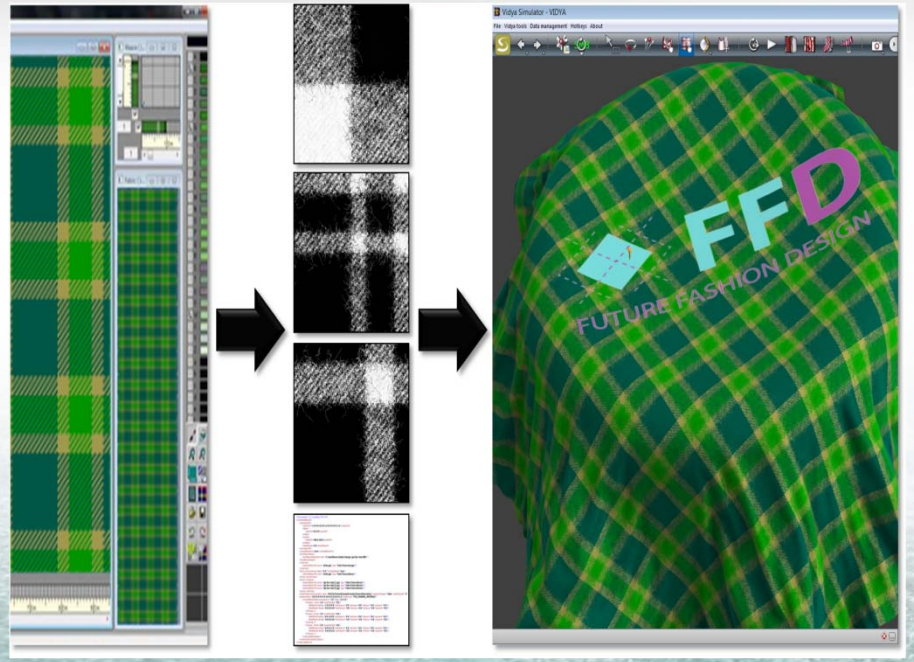
FFD Approach

- Fully virtualized and integrated process of fabric and clothing design
- Advanced surface rendering development of finishing effects
- Optical representation of a fabric in a 3D model, including surface illumination effects of surface finishing to provide hand touch feeling and realistic visualization
- Color calibration under 650D light



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Garment Design - CAD

- Design a Garment in 2D
- Pattern based
- Central modelling process

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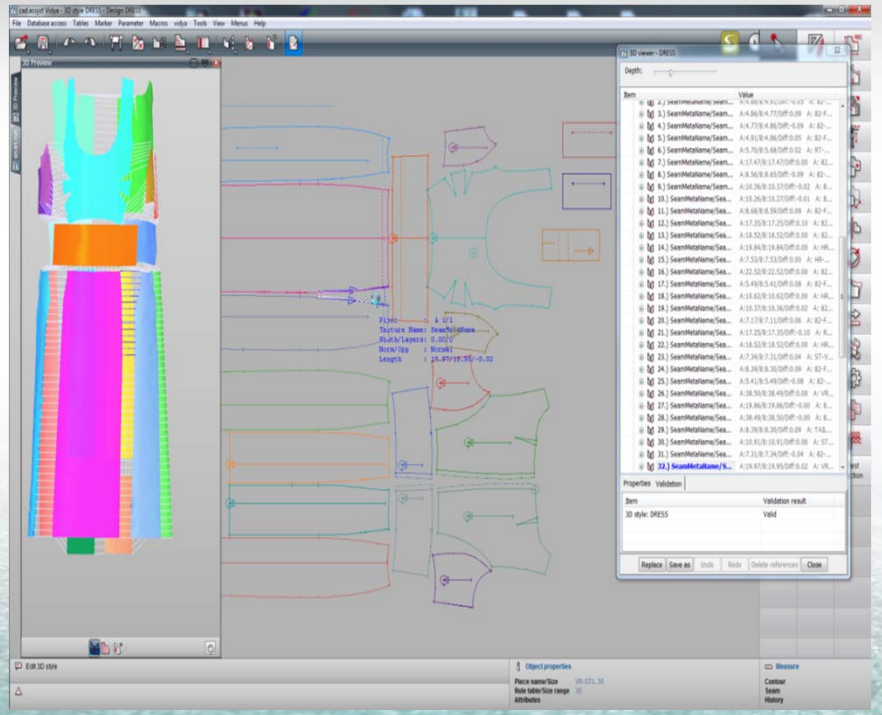
Garment Design – Pattern Detail

- Increase quality of VP process
- Increase fidelity of VP result
- Process inside CAD



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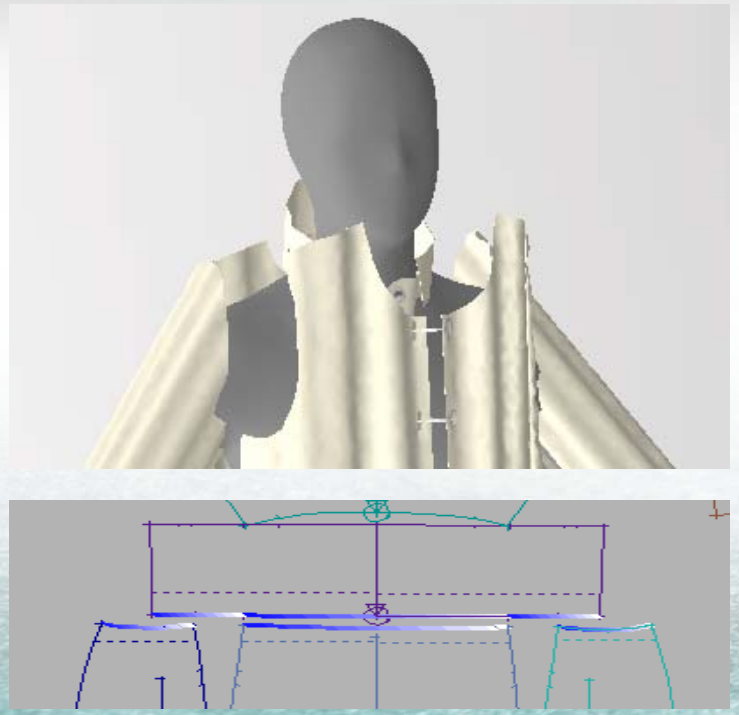
Garment Design – Automatic Seams

- Patterns need to be sewn

- Speedup for VP preparation



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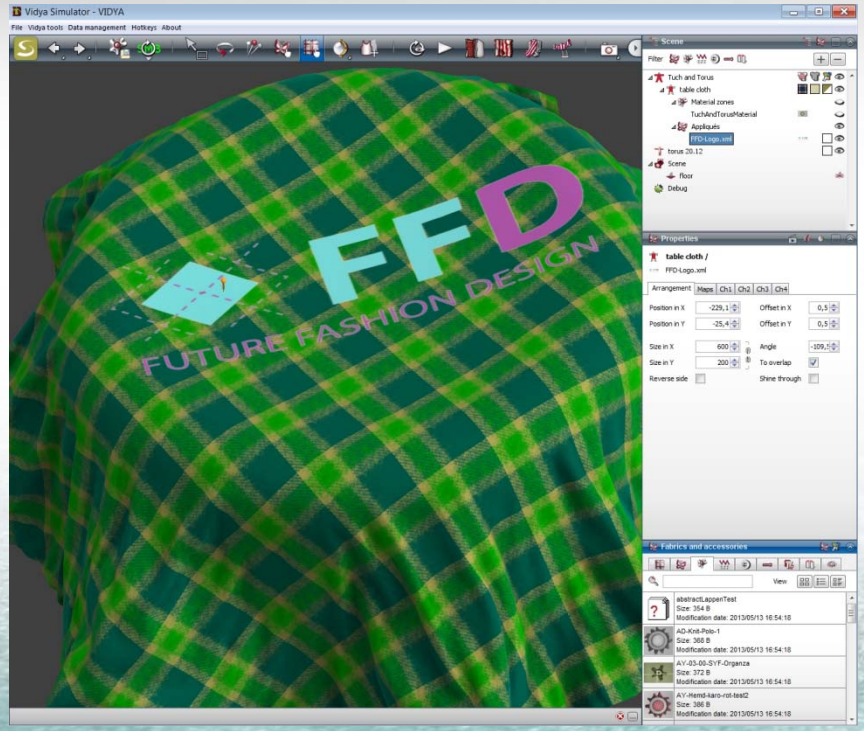
Real-time Virtual Prototyping

- Interact with Fabric and Garment CAD
- Real-time Simulation and Visualization
- Interactive toolset



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Real-time Virtual Prototyping

- High Quality simulation and visualization
- Interact with running simulation
- Change on Textile Design and Placement

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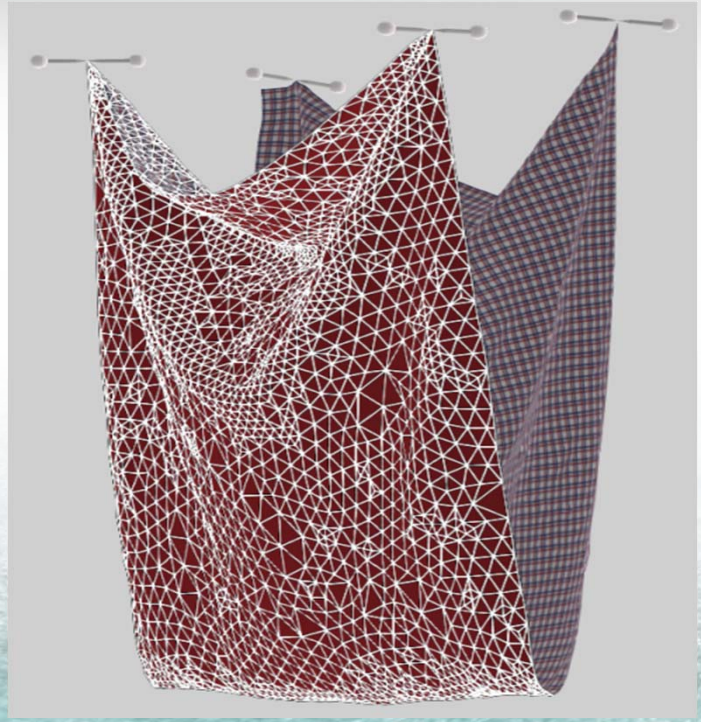
Real-time Virtual Prototyping

- Adaptive Simulation
- High Quality



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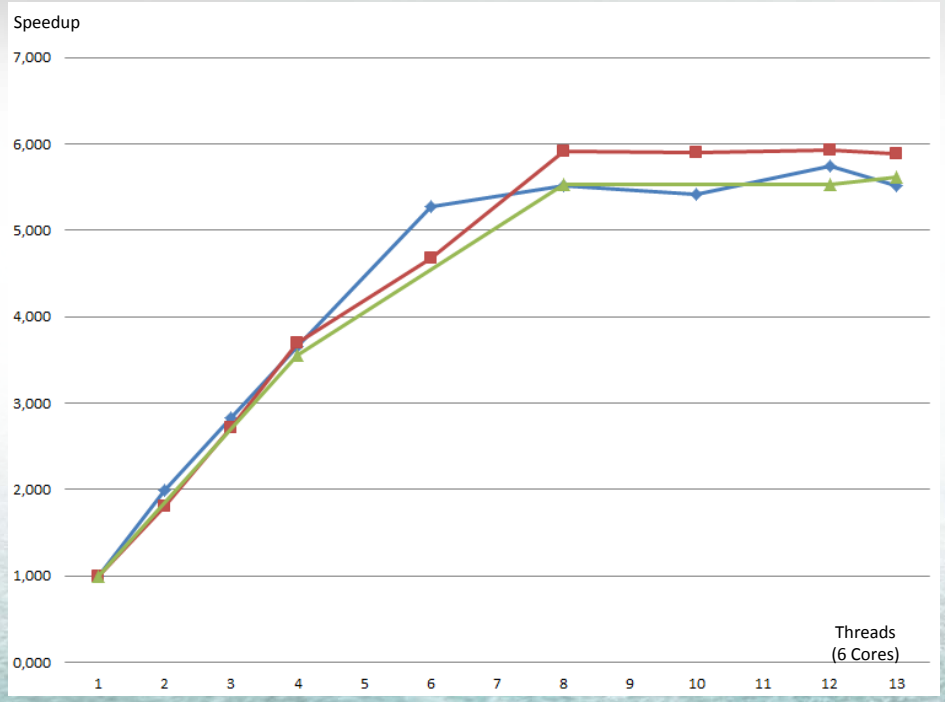
Real-time Virtual Prototyping

- Parallel Simulation
- High Speed



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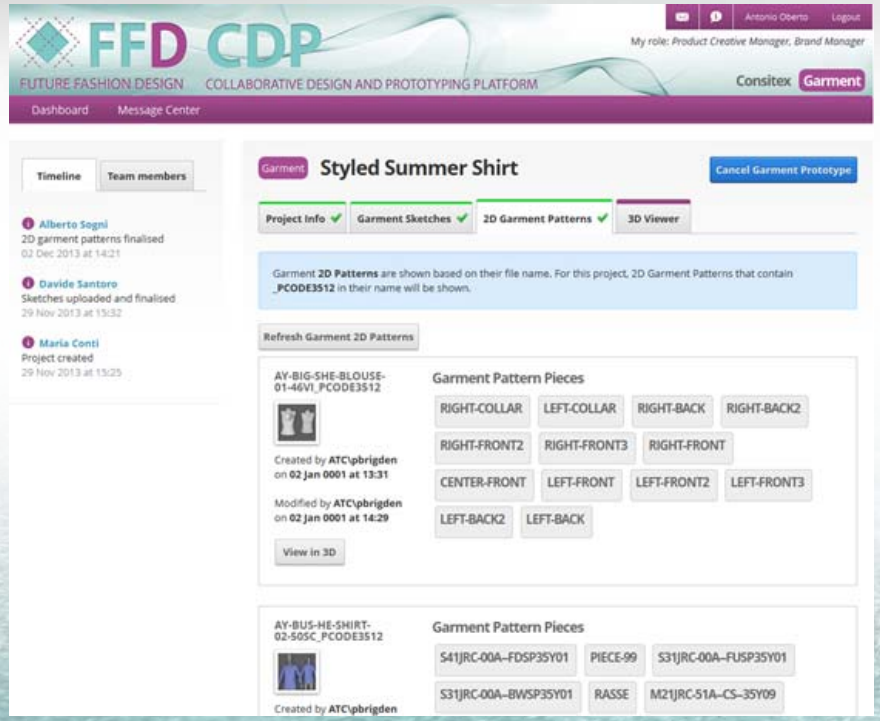
Evaluation, Review and Discussion

Collaborative Aspect

- Discussion
- Presentation
- Product Status updates
- Review
- Ideas
- Workflow control



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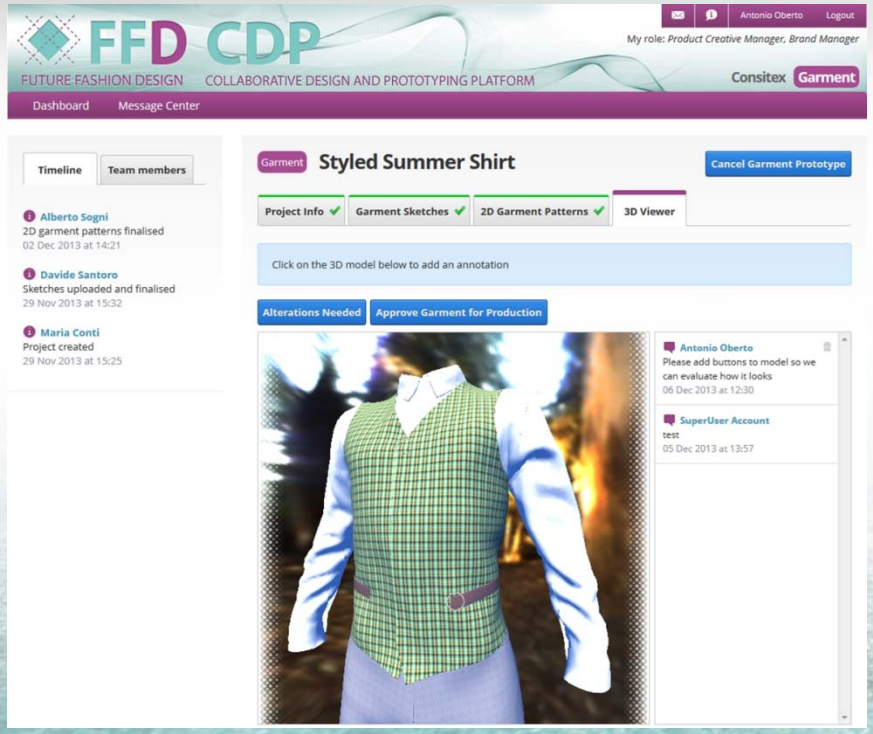
Evaluation, Review and Discussion

Web based Solution

Content presentation

- Applet based 3D viewer



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Conclusions

FFD demonstrates that full integrated virtual design process of fabric and clothing is possible and promising in the long run

The quality level of renderings is reaching the quality requested by the top fashion market, as well as timing and tool user experience

The expected business impact on cost and strategy of full virtual prototyping process is potentially very significant and can improve EU T/C competitive positioning, in relation with its specific focus on design and creativity

The concrete adoption of the process will be progressive and related to the change of designer culture

In relation with the fragmentation of the sector the adoption of the new process by large fashion groups will lead fabric suppliers to its fast acceptance

A fabric rendering format standard is required to uniform their integration into clothing Virtual Prototyping process

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ScotWeave.
ScotCadTextiles

Ermenegildo Zegna

Fraunhofer
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