



RWTH, Peter Winandy

# Digital Nonwoven Production – How to make more than just masks

Cloppenburg, F.; Möbitz, C.; Gries, T.

# Agenda

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- 1 Introduction to ITA**
- 2 Economic Potential for Digitalization in the Nonwoven Industry**
- 3 Polylemma of Digitalization in the Nonwoven Industry**
- 4 Digital Nonwoven Innovation Center**

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## ITA – Facts & Figures

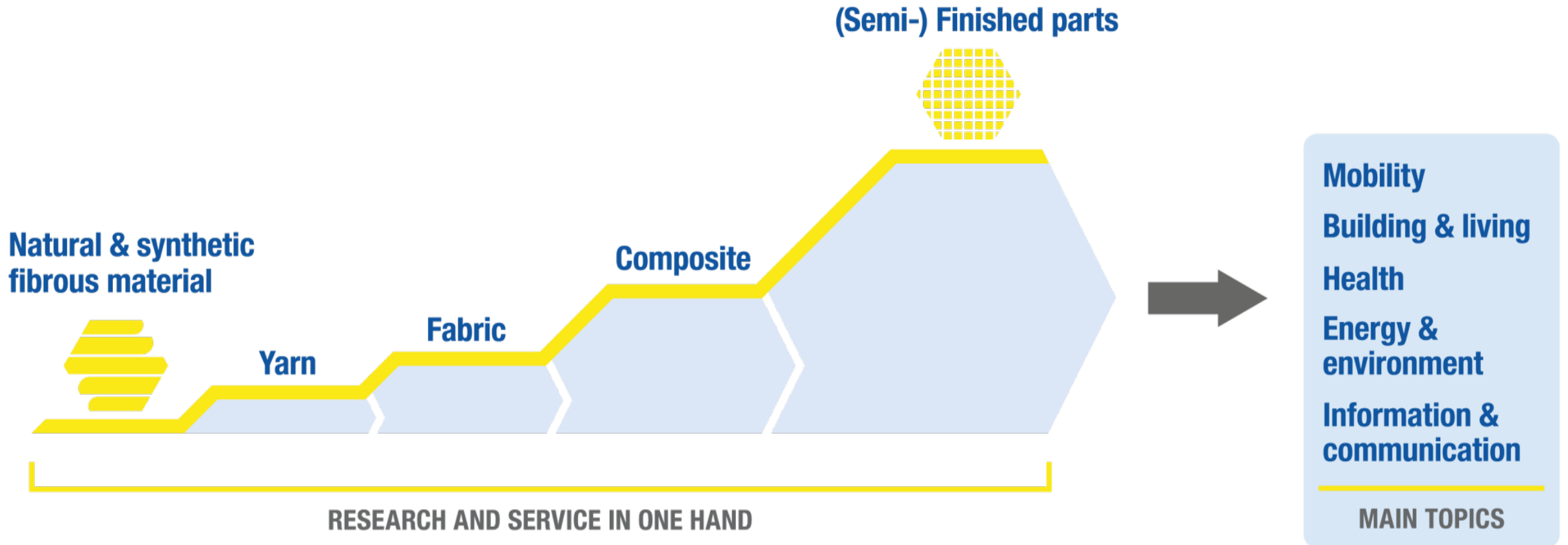
### Personnel

- 110 scientists
- 65 technical and service staff
- 200 undergraduate research assistants
- 50 students p.a., who major in textile eng.

### Budget

- Approx. 15 mill. €
- 65 % industry driven or collaborative research

# Our approach: Comprehensive service



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PRODUCTIVITY

CONNECTIVITY

SAFETY

EFFICIENCY

FLEXIBILITY

# Economic Potential for Digitalization in the Nonwoven Industry

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## How we live our daily lives



## How we produce nonwovens

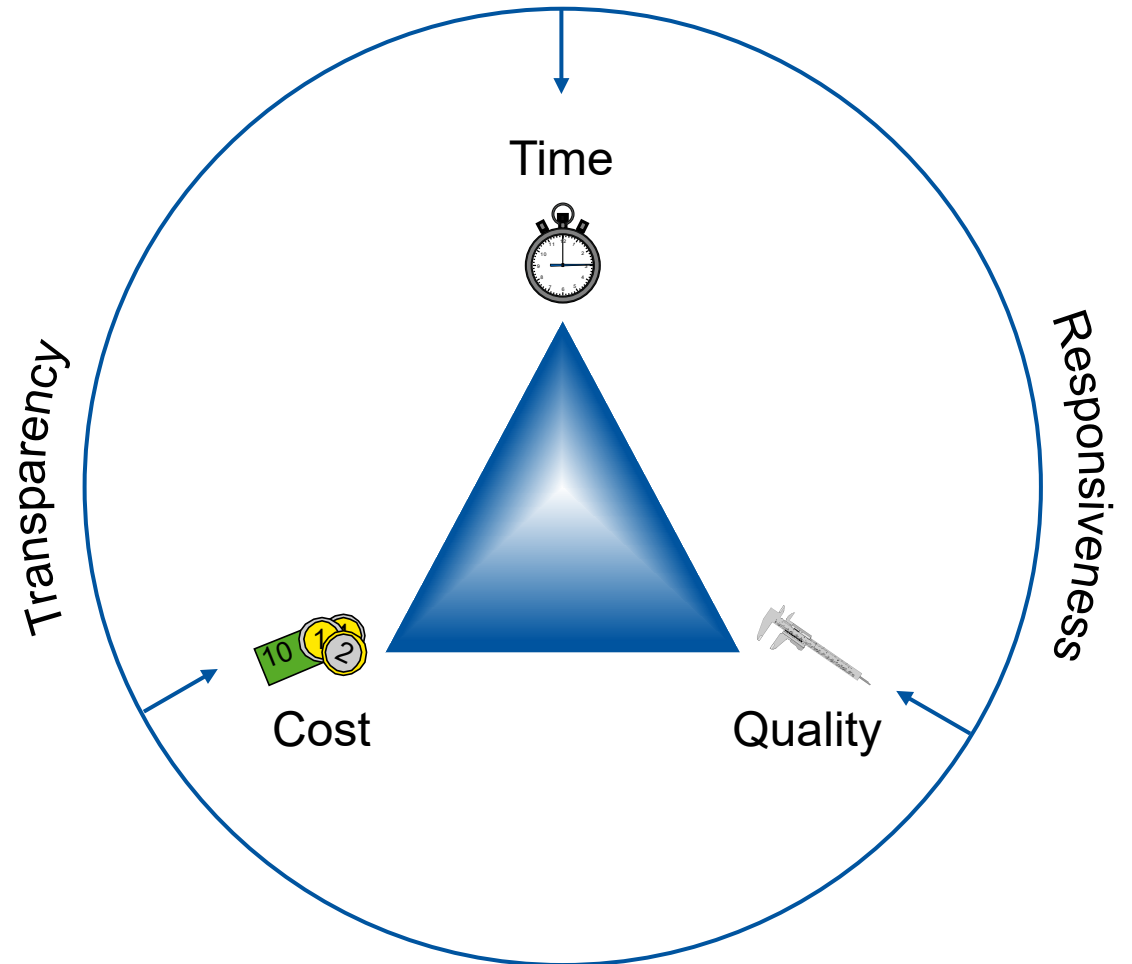


**The result: intransparent production, quality issues, suboptimal production, ...**

# Economic Potential for Digitalization in the Nonwoven Industry

## Goals of Production Optimization

- Traditional Trade-off between time, cost and quality
- Transparency and responsiveness can lead to an optimum in production
  - Deviations are early known through transparency
  - Responsiveness leads to early responses to deviations

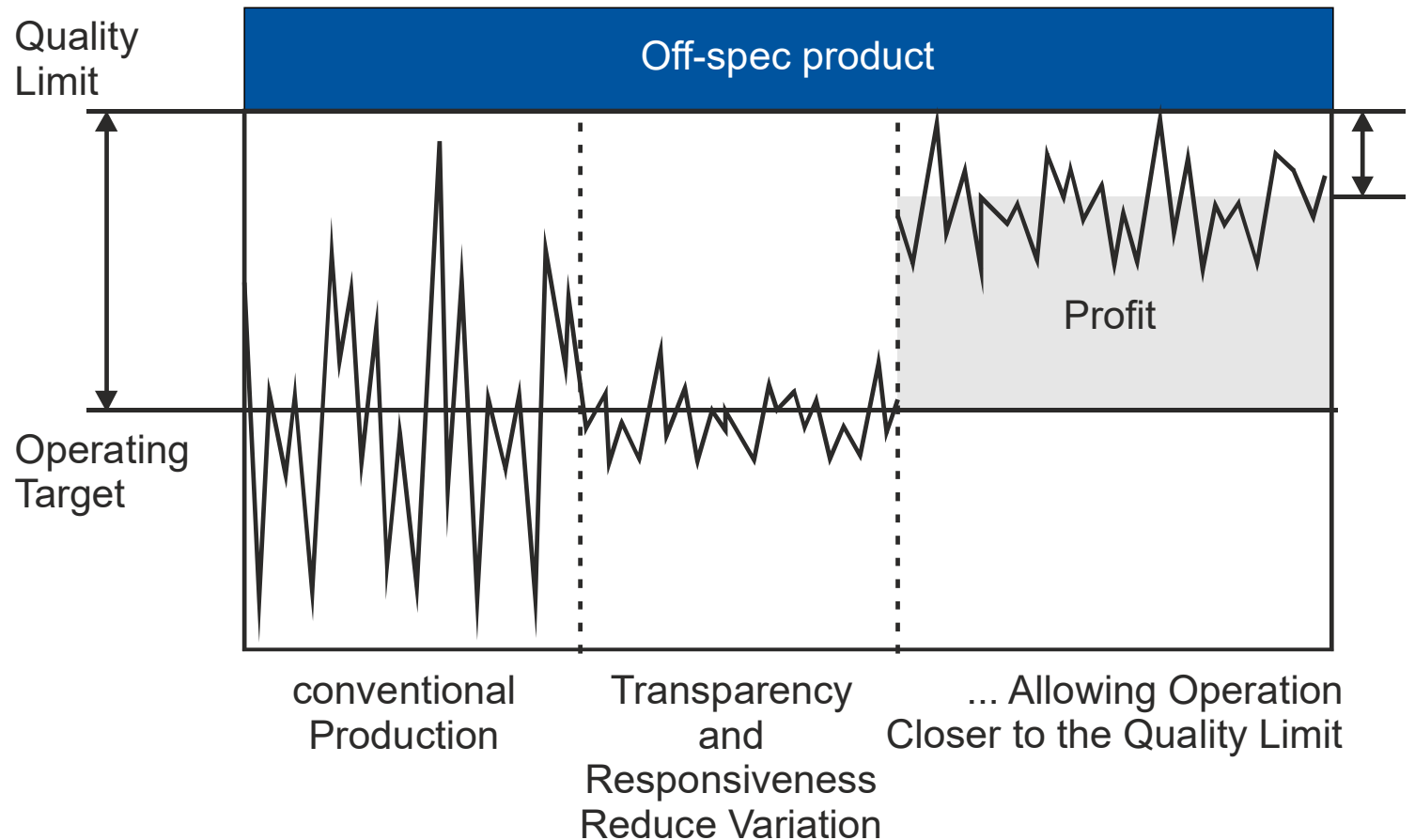




# Economic Potential for Digitalization in the Nonwoven Industry

## Example of Potential – Advanced Process Control

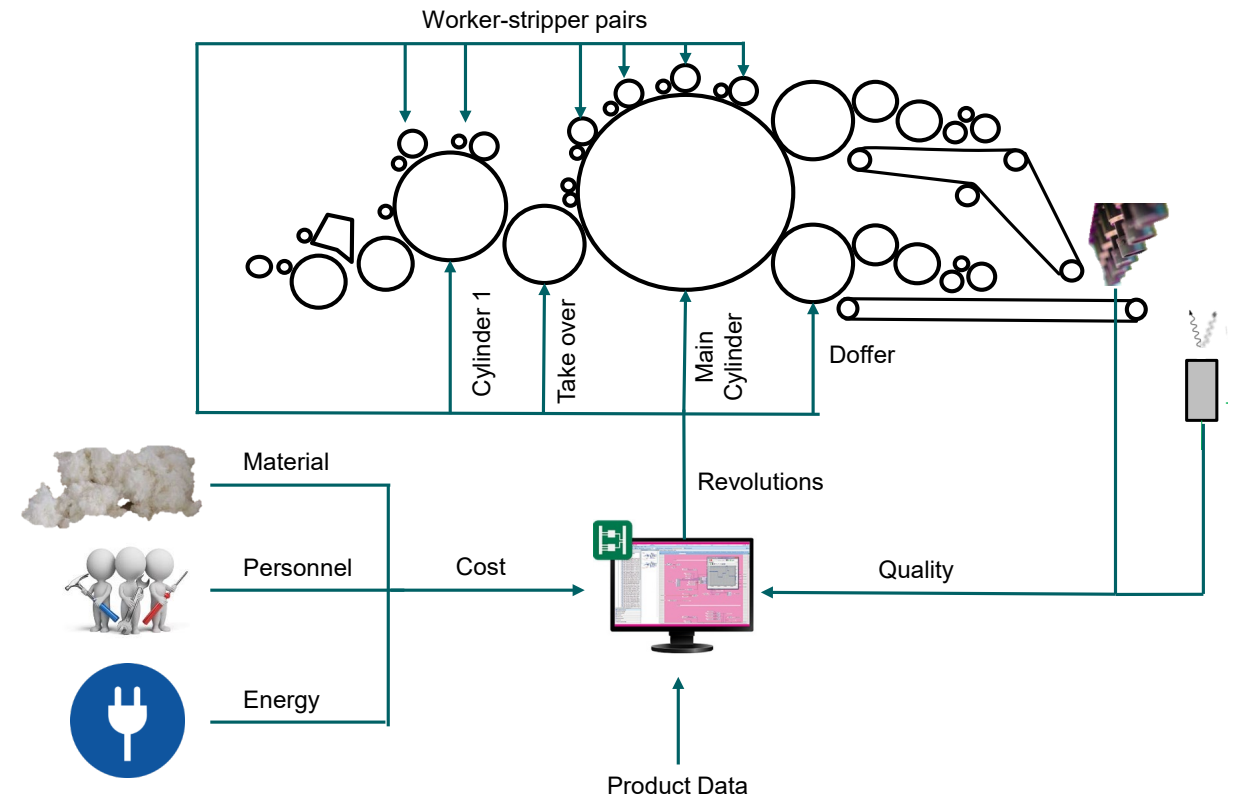
- Quality has to be kept between boundaries
- The process deviation defines the operation target
- Good predictive models for produced quality lead to reduction of the process deviation
- ... and therefore to more profit



# Economic Potential for Digitalization in the Nonwoven Industry

## Example of Realisation - Easy Nonwoven 4.0

- Use of optical inspection systems to surveil web quality during the production
- Modelling and successful prediction of:
  - Areal web weight
  - CV-Values
  - Defects
  - Production cost
- **Optimization routine leads to 30 % higher production rate, while assuring the quality**
- **Every percent of optimization lead to additional profit of 130.000 €/a under industrial conditions**



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# Polylemma of Digitalization in the Nonwoven Industry

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**If the potential is so high, why hasn't everyone started producing digital?**

- Machine builders are building machines
- Nonwoven Producers produce nonwovens
- Commercial developers don't have access to production lines
- Fight for talents
  - Where to get the professionals, who are actually doing the job, if they don't even know the name of the potential employer?

**A deadlock?**



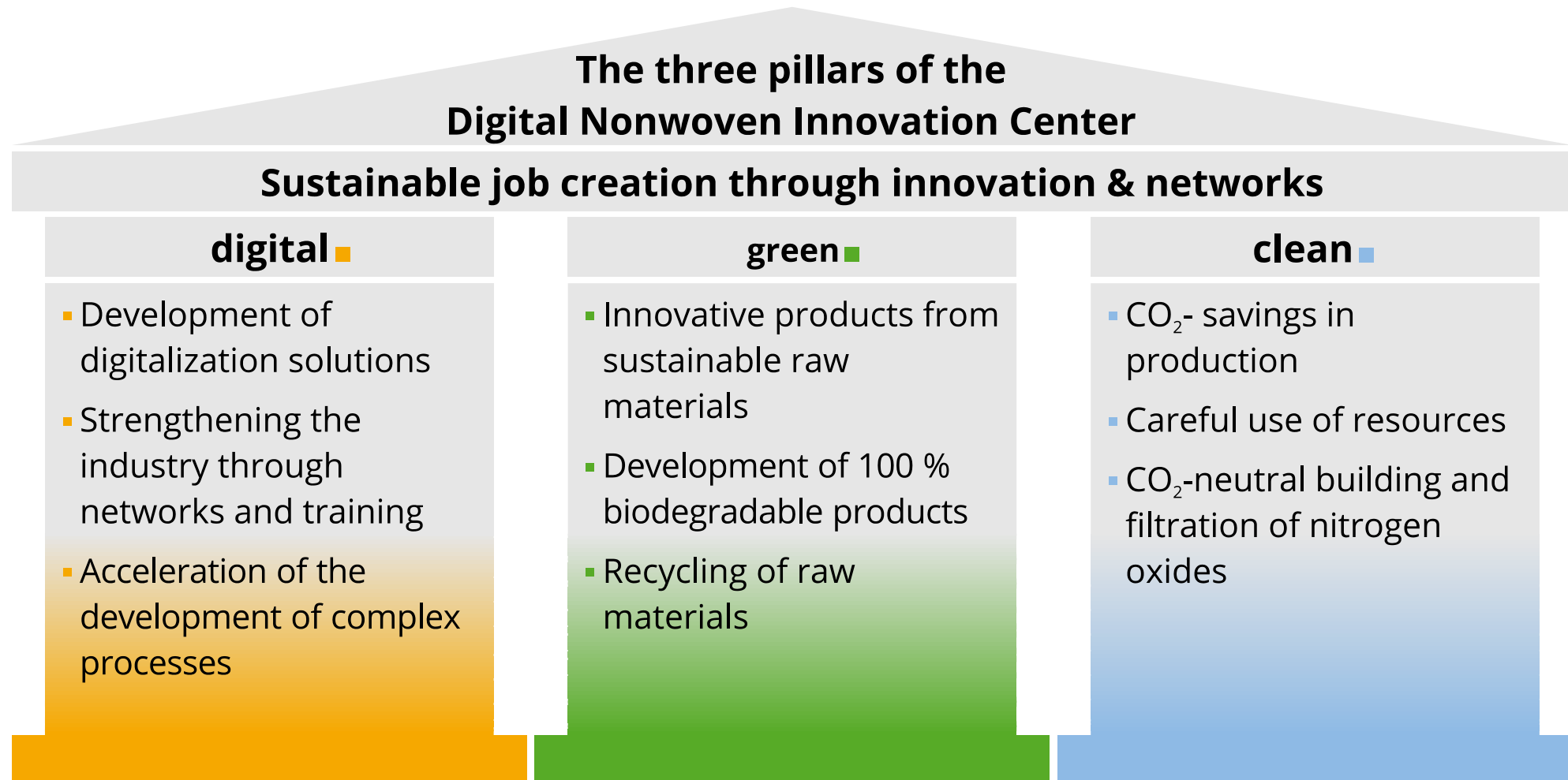
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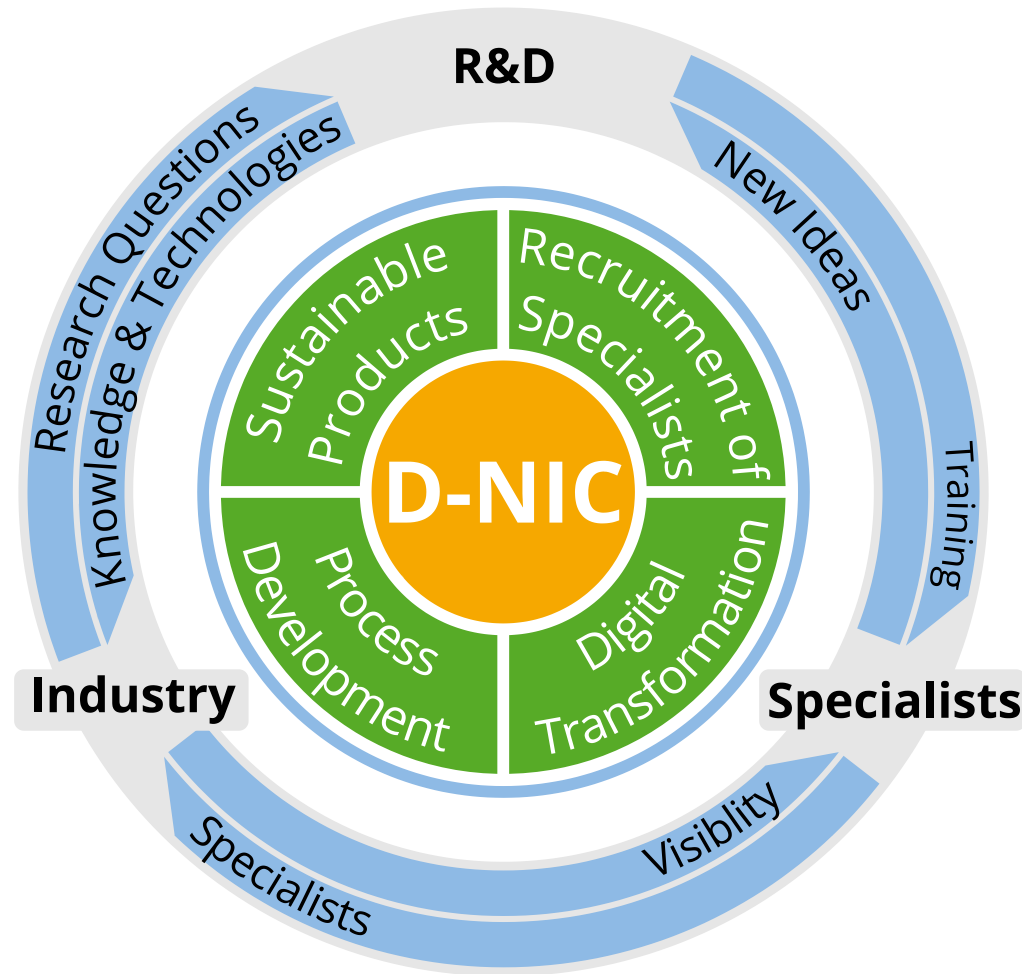
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# Digital Nonwoven Innovation Center





# Digital Nonwoven Innovation Center





**Start of operation: 2024 - Be a part of it!**

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## Your contacts:



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**Thank you  
for your attention!**

**[www.ita.rwth-aachen.de](http://www.ita.rwth-aachen.de)**

## Sources

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- [KS14]: Kletti, J.; Schumacher, J.: Die perfekte Produktion : Manufacturing Excellence durch Short Interval Technology (SIT) 2. Aufl. - Berlin ; Heidelberg: Springer Vieweg, 2014
- [RC06]: Robinson, P. R.; Cima, D.: Advanced Process Control In: Hsu, C. S., Robinson, P. R. (Eds): Practical Advances in Petroleum Processing, New York: Springer, 2006, S. 695-703
- [Clo19]: Cloppenburg, F.: Wirtschaftliche und technische Modellierung und Selbstoptimierung von Vliesstoffkrepeln, Aachen: Shaker, 2019