“Digital transformation in the workplace”

A sector-specific survey on the European chemical, pharmaceutical, rubber and plastics industry

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A few words about the European Sectoral Social Dialogue...
The Project

- January 2018 – December 2019
- Objective: anticipate, prepare and manage change at the workplace in light of innovation and digital transformation
- Desk research and online survey, conducted by Prognos AG
- Two conferences
- Social Partners joint recommendations
### Purpose of the study

#### Objectives

1. Assess the **level of matureness** and the implications for sector development
2. Gain insights into the **differences between the chemicals sectors** regarding the use of innovations around Industry 4.0 and digitalisation
3. Get a better view on the **new systems of work** in the chemicals sector and determine the (potential) impacts on skills, qualifications, working patterns, health & safety

#### Project approach

- **Desk research** on the **state-of-play** of digital transformation (around 90 studies reviewed)
- **European wide stakeholders survey** (around 500 completed questionnaires)
- Around **30 expert interviews** to deepen the discussion
Digital Maturity Model for the European Chemicals Sector

Skills & Lifelong Learning

Smart Product & Service Innovation

Digital Maturity

Smart Production & Operation

Digital Transformation Management

Organisation of Work

Source: Prognos AG (2019), based on own research. Icons: Copyright Flaticon.
Cross-European evidence of the digital transformation in the European chemicals sector

Good representation of the three target groups

Participants by type of organisation ... and by company size.

- Micro or small enterprise (1-49 employees)
- Large enterprise (250-999 employees)
- Medium-sized enterprise (50-249 employees)
- Very large enterprise (1000+ employees)

Employees make up largest share of participants

- Top level management (CEO, CFO, board of directors, managing director, president, vice-president...)
- Blue Collar worker
- Middle level management (general manager, regional manager, senior manager...)
- White Collar worker (first-line supervisor, office manager, team leader)

Broad country coverage

1️⃣st wave of technological transformation is mostly accomplished
2️⃣nd wave coming quickly driven by AI, IIoT & AR / VR

Which of the following digital technologies and approaches do you already use in your company/industry or do you plan to implement in future?

<table>
<thead>
<tr>
<th>Currently used</th>
<th>Currently tested</th>
<th>In the future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital collaboration platforms</td>
<td>60%</td>
<td>24%</td>
</tr>
<tr>
<td>Cloud technologies &amp; applications</td>
<td>53%</td>
<td>23%</td>
</tr>
<tr>
<td>Advanced robotics to automate production</td>
<td>35%</td>
<td>22%</td>
</tr>
<tr>
<td>Industrial Internet of Things for controlling and monitoring processes</td>
<td>28%</td>
<td>21%</td>
</tr>
<tr>
<td>Process simulation and/or virtual reality for production planning</td>
<td>28%</td>
<td>20%</td>
</tr>
<tr>
<td>Augmented reality systems for maintenance activities</td>
<td>26%</td>
<td>18%</td>
</tr>
<tr>
<td>Additive manufacturing</td>
<td>22%</td>
<td>18%</td>
</tr>
<tr>
<td>Virtual and/or augmented reality applications for training and safety...</td>
<td>22%</td>
<td>17%</td>
</tr>
<tr>
<td>Big Data analytics and/or applications of Artificial Intelligence</td>
<td>17%</td>
<td>15%</td>
</tr>
<tr>
<td>Augmented reality systems in logistics</td>
<td>15%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Source: Prognos AG (2019), based on European wide chemical industry stakeholder survey (2018), n=290-376
The Research Findings: The chemical job of the future will require more advanced digital and complex transversal digital skills

**Social Skills**
- The results for the European chemical industry are overall positive
- Particularly self-learning and multi-disciplinary work will gain importance

**Technical Skills**
- Basic digital skills are already widely established
- More advanced digital skills, like programming require more attention

**Transversal Digital Skills**
- Digital communication skills are widely established
- Future need for skills to implement digital solutions & more creative and analytical skills

Assessment of digital transversal skills of employees/industry in the context of digitalisation

**Assessment of current skills of employees**

<table>
<thead>
<tr>
<th>Skill Description</th>
<th>Very poor</th>
<th>Poor</th>
<th>Acceptable</th>
<th>Good</th>
<th>Very good</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills to communicate using digital tools</td>
<td>12%</td>
<td>42%</td>
<td>35%</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Non-technical competencies (e.g., system thinking and process understanding)</td>
<td>19%</td>
<td>38%</td>
<td>31%</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Skills to implement digital solutions</td>
<td>25%</td>
<td>41%</td>
<td>27%</td>
<td>4%</td>
<td></td>
</tr>
<tr>
<td>Design skills (e.g., visualisation of ideas, creation of blueprints, etc.)</td>
<td>7%</td>
<td>31%</td>
<td>43%</td>
<td>17%</td>
<td>3%</td>
</tr>
</tbody>
</table>

**More important in next 5 years?**

<table>
<thead>
<tr>
<th>Skill Description</th>
<th>0%</th>
<th>25%</th>
<th>50%</th>
<th>75%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skills to communicate using digital tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>80%</td>
</tr>
<tr>
<td>Non-technical competencies (e.g., system thinking and process understanding)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>64%</td>
</tr>
<tr>
<td>Skills to implement digital solutions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>80%</td>
</tr>
<tr>
<td>Design skills (e.g., visualisation of ideas, creation of blueprints, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65%</td>
</tr>
</tbody>
</table>

Digitalisation will lead to more mobile working, multi-tasking and multidisciplinary work in the chemical industry

How would you assess the impact of digitalisation on the working environment?

<table>
<thead>
<tr>
<th>Mobile working</th>
<th>Decrease greatly</th>
<th>Decrease slightly</th>
<th>Stay the same</th>
<th>Increase slightly</th>
<th>Increase greatly</th>
</tr>
</thead>
<tbody>
<tr>
<td>17%</td>
<td></td>
<td>42%</td>
<td>38%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tasks that need to be completed at the same time by employees (multi-tasking)</th>
<th>Decrease greatly</th>
<th>Decrease slightly</th>
<th>Stay the same</th>
<th>Increase slightly</th>
<th>Increase greatly</th>
</tr>
</thead>
<tbody>
<tr>
<td>6%</td>
<td>19%</td>
<td>39%</td>
<td>34%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Collaboration in heterogenous and interdisciplinary teams</th>
<th>Decrease greatly</th>
<th>Decrease slightly</th>
<th>Stay the same</th>
<th>Increase slightly</th>
<th>Increase greatly</th>
</tr>
</thead>
<tbody>
<tr>
<td>22%</td>
<td></td>
<td>43%</td>
<td>32%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual responsibility for working results by employees</th>
<th>Decrease greatly</th>
<th>Decrease slightly</th>
<th>Stay the same</th>
<th>Increase slightly</th>
<th>Increase greatly</th>
</tr>
</thead>
<tbody>
<tr>
<td>26%</td>
<td></td>
<td>44%</td>
<td>26%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employee autonomy and self-determination over working-tasks</th>
<th>Decrease greatly</th>
<th>Decrease slightly</th>
<th>Stay the same</th>
<th>Increase slightly</th>
<th>Increase greatly</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>17%</td>
<td>46%</td>
<td>25%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employee autonomy and self-determination over working-hours</th>
<th>Decrease greatly</th>
<th>Decrease slightly</th>
<th>Stay the same</th>
<th>Increase slightly</th>
<th>Increase greatly</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>27%</td>
<td>41%</td>
<td>24%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Working outside standard working hours</th>
<th>Decrease greatly</th>
<th>Decrease slightly</th>
<th>Stay the same</th>
<th>Increase slightly</th>
<th>Increase greatly</th>
</tr>
</thead>
<tbody>
<tr>
<td>6%</td>
<td>28%</td>
<td>43%</td>
<td>21%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Repetitive tasks performed by employees</th>
<th>Decrease greatly</th>
<th>Decrease slightly</th>
<th>Stay the same</th>
<th>Increase slightly</th>
<th>Increase greatly</th>
</tr>
</thead>
<tbody>
<tr>
<td>14%</td>
<td>29%</td>
<td>28%</td>
<td>18%</td>
<td>11%</td>
<td></td>
</tr>
</tbody>
</table>

Hazardous tasks will decrease due to digital technology, but psychological stress will increase

Effect on the number of hazardous tasks

- Decrease greatly: 38%
- Decrease slightly: 16%
- Stay the same: 27%
- Increase slightly: 7%
- Increase greatly: 5%

Effect on the level of psychological stress

- Decrease greatly: 28%
- Decrease slightly: 18%
- Stay the same: 10%
- Increase slightly: 3%
- Increase greatly: 40%

General health of employees

- Decrease greatly: 7%
- Decrease slightly: 5%
- Stay the same: 19%
- Increase slightly: 19%
- Increase greatly: 42%

Assessment of current collective agreements

Current state

- Mobile working
- Working-time flexibility
- Compatibility of work, family and private interests through digital technologies
- Occupational training, future skills needs and lifelong learning schemes
- Employee data protection
- Performance monitoring and employee privacy
- Occupational safety and digital technologies
- Job substitution and slack labour
- Working hours
- Employee participation in the workplace

Future relevance

- Mobile working
- Working-time flexibility
- Compatibility of work, family and private interests through digital technologies
- Occupational training, future skills needs and lifelong learning schemes
- Employee data protection
- Performance monitoring and employee privacy
- Occupational safety and digital technologies
- Job substitution and slack labour
- Working hours
- Employee participation in the workplace
### Six overall conclusions on the digital transformation in the workplace of the European chemical sector

1. **1st wave of digital transformation** successfully *accomplished* in the chemicals sector

2. **2nd wave of digital transformation** (AI, IIoT, AR) will come *into effect* shortly

3. **Skills shift clearly visible**: advanced digital & transversal skills require more attention

4. **Working environment** changed through mobile working with greater employee autonomy but increase of multi-tasking

5. **Collective agreements** need to address more intensively the issue of *mobile working*, working-time arrangements & *qualification* while not forgetting about other sensitive issues

6. **Change management** and the *involvement & support of employees* are big challenges with regard to the overall digital transformation process
• Final project conference in The Hague, November 2019: focus on health and safety, skills, change management, challenges for SMEs

• “Post project topics” in our work programme

• Encourage use of survey results for EWC discussions
Survey reports, conference presentations, Joint Recommendations:

http://www.ourfutureworkplace.eu/
Thank you for your attention