Industry 4.0: Building the Digital Enterprise

December 2, 2016
**Agenda**

About the study
Defining Industry 4.0 and results
Conclusion – what companies need to do now
About the study
PwC’s 2016 Global Industry 4.0 Survey of industrial products companies is the biggest survey of its kind in studies of Industry 4.0 to-date.

**Methodology:**
Based on research conducted between November 2015 and January 2016 with more than 2,000 senior executives from industrial products companies in 26 countries. The majority of participants were Chief Digital Officers or other senior executives with top-level responsibility in their company for Industry 4.0 strategy and activity. Results were weighted by country GDP to provide a balanced view in global.
Defining Industry 4.0 and results
Defining Industry 4.0 – the fourth industrial revolution

- Industry 4.0 focuses on the end-to-end digitization of all physical assets and processes as well as integration into digital ecosystems with value chain partners.
- Data and analytics is a core capability for Industry 4.0.
- Industry 4.0 applications are fueled by key enabling technologies.
Key findings of the Industry 4.0 study
From talk to action – Industry 4.0 moved from hype to real results

Digitalization is happening fastest in areas close to the core business.

- Vertical value chain integration: Today 41%, In 5 years 72%
- Horizontal value chain integration: Today 34%, In 5 years 65%
- Digital business models, product and service portfolio: Today 29%, In 5 years 64%
- Product development & engineering: Today 42%, In 5 years 71%
- Customer access, sales channels & marketing: Today 35%, In 5 years 68%

Percentage of companies surveyed reporting high degrees of digitization and integration today/in five years in the different parts of their company

High level of digitization today/in five years
Industrial production companies globally will invest 5% of their digital revenue or US$907 billion per year until 2020, with 55% expecting ROI within two years.

Industry 4.0 investment (in % per year of digital revenue until 2020)

Expected return on investment period for digital investments
**Digitization drives quantum leaps in performance**

Companies expect to reduce operational costs by 3.6% per year, while increasing their annual revenue by 2.9% per year.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Additional revenue – in % per year until 2020</th>
<th>Additional revenue – in USD bn per year until 2020</th>
<th>Cost reduction – in % per year until 2020</th>
<th>Cost reduction – in USD bn per year until 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerosp. / Defence</td>
<td>2.7%</td>
<td>40</td>
<td>3.7%</td>
<td>49</td>
</tr>
<tr>
<td>Chemicals</td>
<td>3.1%</td>
<td>28</td>
<td>3.9%</td>
<td>78</td>
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<tr>
<td>Eng. &amp; Constr.</td>
<td>2.7%</td>
<td>11</td>
<td>3.4%</td>
<td>49</td>
</tr>
<tr>
<td>Forest Paper / Pack.</td>
<td>3.1%</td>
<td>37</td>
<td>4.2%</td>
<td>54</td>
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<tr>
<td>Metals</td>
<td>2.7%</td>
<td>105</td>
<td>3.2%</td>
<td>52</td>
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<tr>
<td>Indust. Manuf.</td>
<td>2.9%</td>
<td>103</td>
<td>3.6%</td>
<td>61</td>
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<tr>
<td>Transp. / Logist.</td>
<td>2.7%</td>
<td>52</td>
<td>3.2%</td>
<td>62</td>
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<tr>
<td>Electronics</td>
<td>3.1%</td>
<td>108</td>
<td>3.7%</td>
<td>62</td>
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<tr>
<td>Automotive</td>
<td>3.1%</td>
<td>40</td>
<td>3.9%</td>
<td>28</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>2.9%</strong></td>
<td><strong>493</strong></td>
<td><strong>3.6%</strong></td>
<td><strong>421</strong></td>
</tr>
</tbody>
</table>

PwC
Industry 4.0 is accelerating globalization with regional differences

Germany, Japan and the US are making the strongest push for digitization.

Regional expectations –
high degrees of digitization and integration today/in five years
Industry 4.0 is accelerating globalization with regional differences

Germany, Japan and the US are making the strongest push for digitization.

Regional expectations – Big gains are anticipated by industrial products companies in all regions
Data management and analytics are the foundation of Industry 4.0

More than 80% of companies expect data analytics will have a significant influence on their decision-making processes in five years’ time.

Significance of gathering, analysis and utilization of data for decision making today/ in five years – country specific and in general
Companies need to expand their use of big data analytics

Companies use predictive analytics mainly for planning and controlling and not yet for customer developments and to develop new products.

Which areas are companies using big data analytics today/ in five years
Company-wide data analytics capabilities require change
38% of companies currently rely on selective, ad hoc capabilities of single employees; still the majority rate their capabilities as medium or advanced.

How advanced is your company in data analytics
- 52% Medium
- 18% Advanced
- 22% Poor
- 8% Outsourced to external partners

How are data analytics capabilities organized in your company
- 14% Dedicated department for data analysis serving many functions across the company
- 35% Data analytics is embedded within specific functions
- 9% No significant data analysis capabilities
- 38% Selective, ad-hoc data analysis capabilities of single employees
- 5% Data analysis services are outsourced and performed by external service providers

Note: Answers shown are rounded
Lack of expertise: a barrier on the way to Industry 4.0

Companies see the biggest implementation challenge not in the right technology, but in a lack of digital culture and skills.

What are the biggest implementation challenges for building digital operations capabilities?

- Lack of digital culture and training: 50%
- Lack of a clear digital operations vision and support/leadership from top management: 40%
- Unclear economic benefit and digital investments: 33%
- High financial investment requirements: 30%
- Insufficient talent: 25%
- Leadership from top management: 25%
- Lack of digital standards, norms and certification: 21%
- Slow expansion of basic infrastructure technologies: 18%
- Unresolved questions around data security and data privacy with external data: 16%
- Concerns around loss of control over your company’s intellectual property: 14%
Conclusion: What companies need to do now
Blueprint for implementation success
Six steps companies need to take to build a digital enterprise

1. Map out your Industry 4.0 strategy
2. Create initial pilot projects
3. Define the capabilities you need
4. Become a virtuoso in data analytics
5. Transform into a digital enterprise
6. Actively plan an ecosystem approach
Conclusion

1. Companies are getting down to business with Industry 4.0 - they expect Industry 4.0 cost savings of US$ 421 billion per year and additional revenue of US$ 493 billion per year.

2. Companies will invest 5% of their revenue or US$ 907 billion annually by 2020, with the majority expecting a return on investment within two years.

3. Industry 4.0 is accelerating globalization, with distinct regional specification.

4. Data management and analytics are the foundation of Industry 4.0 – companies need to use the full potential of predictive analytics to succeed.

5. The biggest implementation challenge isn’t the right technology, it’s a lack of digital culture and skills in their organization. Companies need to drive digital transformation from the top-management all the way to the shop floor.
Your questions?

- Big investments with big impacts: it’s time to commit
- Industry 4.0 is accelerating globalisation, but with a distinctly regional flavour
- Robust, enterprise-wide data analytics capabilities require significant change
- Data analytics and digital trust are the foundation of Industry 4.0
- From talk to action
- Digitisation drives quantum leaps in performance
- Deepen digital relationships with more empowered customers
- Focus on people and culture to drive transformation
For further conversation on Next Manufacturing / Industry 4.0, contact:

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