

Digitally Prepared?

A view on the Industry's readiness for Industry 4.0 and developments since 2015

By Dr. Veronica Schey and Péter Khaut

Awareness about Industry 4.0 increasing ♦ **35% of companies with concrete projects** ♦ **Industry 4.0 not a priority** ♦ **Expected benefits: costs reduction and new business models** ♦ **IT budgets up** ♦ **Pulp & Paper trailing other industries**

Background

StepChange Consulting relaunched a global Industry 4.0 survey conducted two years ago¹. Results were analyzed to understand trends and developments in comparison to 2015.

Industry 4.0, Big Data, Smart Manufacturing, Internet of Things, Industrie du Futur, Fabrica Intelligente or Smart Industry are all referring to the same developments in digitalization: mass data collection, big data analytics, connectivity and system integration across manufacturing value chains. Digital manufacturing can leverage enormous unrealized potentials from the digitalization of industrial processes, products and services.

Industry 4.0 will play a key role in developing solutions to capture potentials and ensure manufacturing competitiveness.

The goal of the survey was to capture the current status regarding awareness, level of implementation, drivers and barriers with respect to Industry 4.0 in Pulp, Paper and Packaging.

Study highlights

- Awareness increased by 67% compared to 2015
- 93% of participants believe that Industry 4.0 will impact their industry and 62% expect it to be a game changer
- Industry 4.0 is among Top 3 priorities for only 18% of Pulp, Paper and Packaging respondents
- 75% of Pulp, Paper and Packaging companies have no clear formulated strategy for Industry 4.0
- The Automotive industry is considered most advanced regarding Industry 4.0

- The most prepared region for Industry 4.0 is considered North America

Survey demographics

Around 200 individuals participated in the study. The majority of respondents (73%) are from the Pulp, Paper and Packaging (PPP) industry. Respondents from other industries cover a wide spectrum of industries, e.g. Machinery & Engineering, Energy, Automotive, Building and Construction, Communication, High Tech & Technology, among others. Within the PPP industry, the major subgroups were Paper & Board (38%), Publishing & Graphic Paper (19%) and Pulp (16%).

The survey was completed primarily by high ranking managers. (Figure 1).

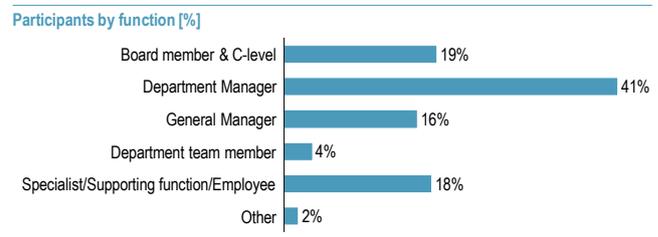


Figure 1 – Demographic of respondents by function

Close to 60% of the participants are from large companies (Figure 2).

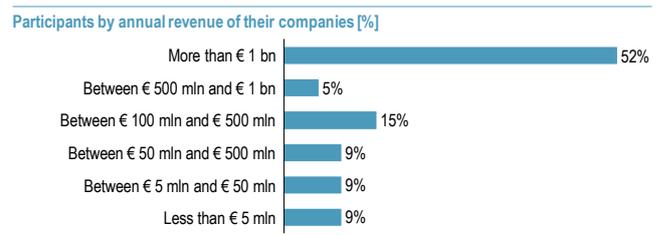


Figure 2 – Demographic of respondents' companies by annual revenue

¹ Industry 4.0 study conducted in cooperation with CEPI and SITRA

The geographic footprint of the companies who participated show a global presence. 72% operate in Western Europe, 58% in Northern Europe and 51% in Eastern Europe. In North America 45% are present and in China 35% (Figure 3).

Where is your company operating? (multiple answers allowed)

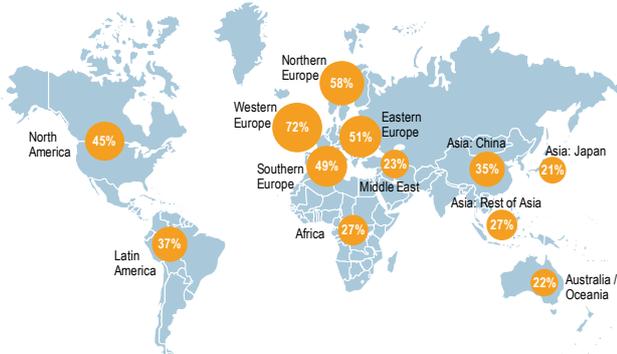


Figure 3 – Operating regions of respondents' companies

The results of the survey were analyzed and compared to the results of the 2015 study in order to show the change of perception towards Industry 4.0. Additionally, results were analyzed in order to see differences by industry. This summary primarily focuses on the results from participants from the forest based sector.

Impact and priorities – Awareness increasing, priority still low

Awareness about Industry 4.0 has clearly increased compared to 2015. 81% of participants are now familiar with the term compared to only 48% in 2015 (Figure 4).

Have you heard the term Industry 4.0? [%]

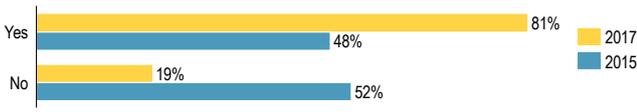
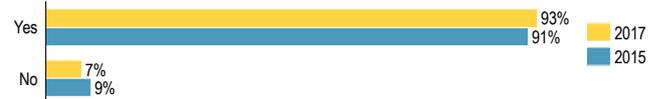


Figure 4 – Term "Industry 4.0"

Answers to the question about the impact of Industry 4.0 on the industry provide a mixed view. The picture about the impact on the industry in general remains similarly high in 2017 as in 2015: In 2017 respondents see a much higher potential impact on their own company compared to 2015. 62% (compared to only 45% in 2015) see a "game changing" impact on their own company (Figure 5).

Do you expect Industry 4.0 to impact your industry? [%]



Do you expect Industry 4.0 to be a game changer for your company? [%]

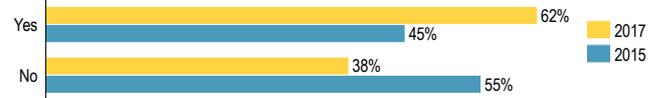


Figure 5 – Impact of Industry on respondent's industry and company

Regarding top priorities of companies in PPP, there are some changes compared to 2015 in terms of the priority given to Industry 4.0. While industry 4.0 is still not among top priorities and only mentioned by 18% of respondents, it has significantly increased in importance. Top priorities remain cost reduction (45%), taking the lead from Product development & Innovation (38% vs. 51%). Supply chain development and Sustainability development have gained importance (28% vs. 11% and 28% vs. 20%, respectively) (Figure 6).

Please select your company's TOP 3 PRIORITIES from your perspective [%]

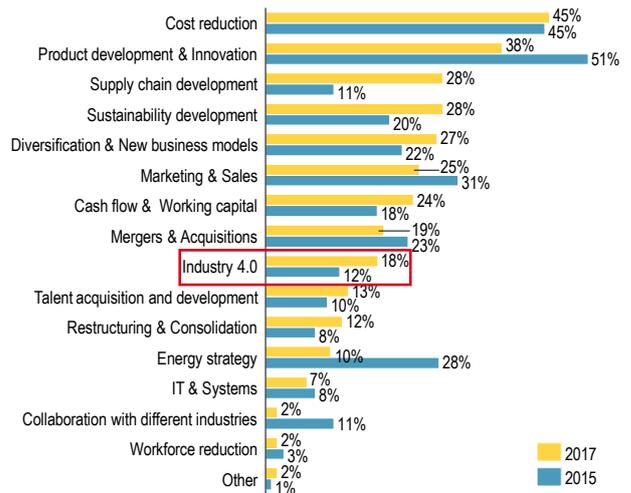


Figure 6 – Top priorities of PPP companies

The survey shows that the majority of respondents (70%) do not believe their companies have a clearly formulated strategy for Industry 4.0. The split by industry shows that this high number is mainly driven by the PPP industry, where 75% of respondents don't believe to have a clear strategy, while this number for non-PPP companies is only 55% (Figure 7).

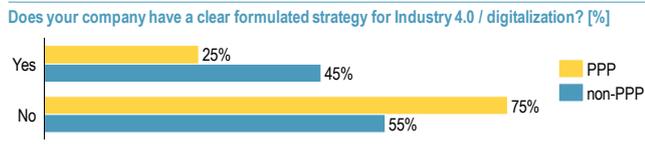


Figure 7 – Strategy for Industry 4.0

The current level of engagement with the topic shows an improving trend since 2015. Only 17% of respondents state there is “No work in progress” compared to 29% in 2015, while the share of responses with the status “Roadmap definition” and “Implementation” increased from 7% to 16% and from 6% to 19%, respectively (Figure 8). This means that 35% of respondents are engaged in specific projects compared to only 13% in 2015.

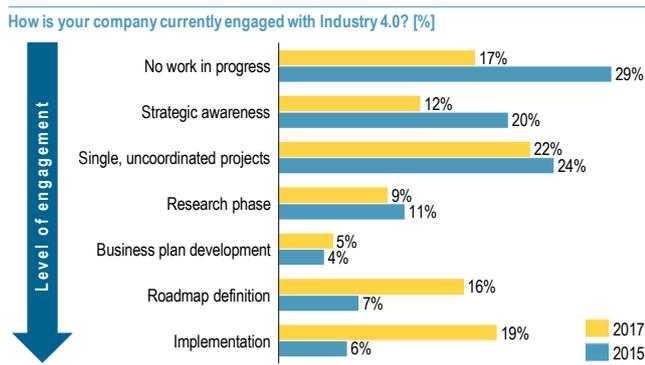


Figure 8 – Level of engagement with Industry 4.0 of PPP companies

An increased IT budget in a company can be considered as an indicator for the number of projects connected to Industry 4.0 being implemented. Figure 9 shows that 65% of PPP and 68% of non-PPP companies reported an increased budget during the last two years, while around one third of respondents stated no change in the IT budget in this period.

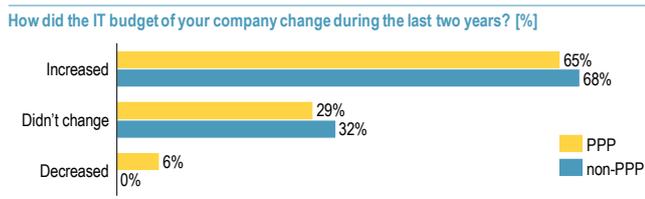


Figure 9 – IT budget development within the last two years

Stages of Industry 4.0 – Readiness increasing

Within the last two years the Pulp, Paper and Packaging industry showed some improvement in terms of the implementation of the five pillars of Industry 4.0 (smart equipment, networking and connectivity, data analytics, smart products, value chain integration). Figure 10 shows the status in 2015 and in 2017. Outside the PPP industry the changes have been minor, whereas the PPP industry shows a remarkable development in all areas mainly in Data analytics and Smart products.

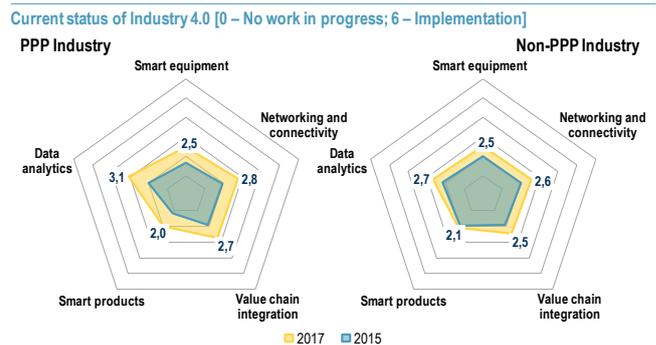


Figure 10 – Current status of Industry 4.0

In terms of supplier readiness, some improvements are visible in 2017. However, only 17% of suppliers are seen as being “Prepared” or “Very prepared” (Figure 11). 24% of participants state that their suppliers are not prepared.

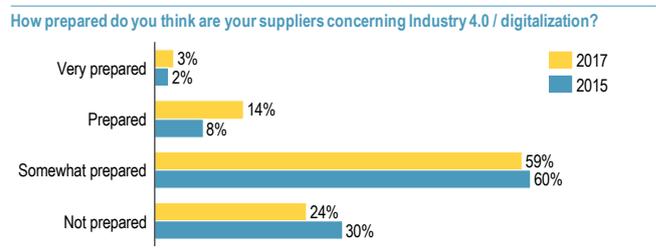


Figure 11 – Readiness of suppliers in the PPP industry

Customer readiness seems similar but is increasing. Only 15% of participants believe their customers are "Prepared" or "Very prepared" (Figure 12). Only 19% of respondents state that their customers are not prepared at all, almost 10pp less than in 2015.

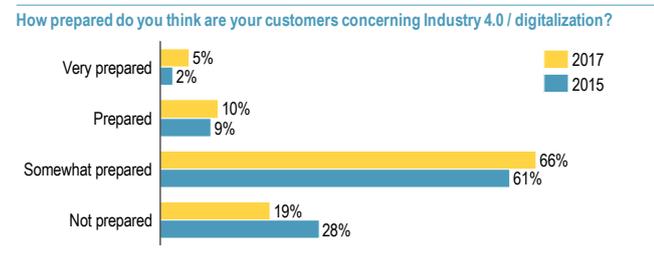


Figure 12 – Readiness of customers in the PPP industry

Expectations remain high with respect to the impact of Industry 4.0 on supply chain transformation. 89% (+4pp) expect a high impact of digitalization on their supply chain (Figure 13).

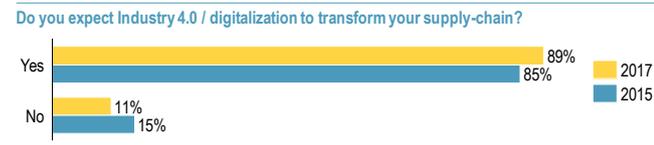


Figure 13 – Expected impact on Supply Chain

With respect to the benefits expected from Industry 4.0, priorities have not changed but the degree of responses have increased. The highest expected business benefits from Industry 4.0 are cost reduction (79%), followed by new business models (49%), energy efficiency (up by 12pp) and sales growth (up by 12pp) - see Figure 14.

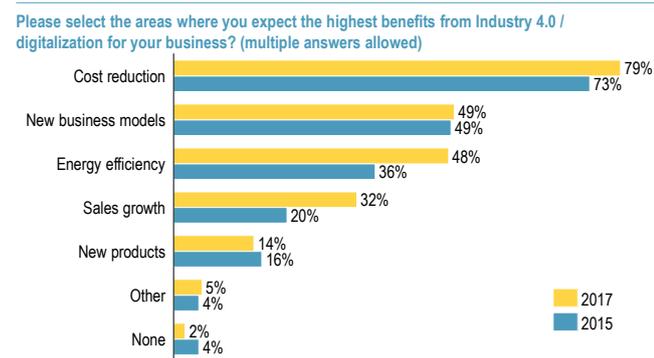


Figure 14 – Areas of highest benefits on business by the PPP industry

Regarding expected societal benefits, Industry 4.0 is expected to lead to improved sustainability, increased availability of

skilled labor and improved working conditions (Figure 15). However, regarding the expectation that Industry 4.0 will lead to the (re)-industrialization of Europe, respondents are more skeptical than in 2015 (down by 10pp to 34%).

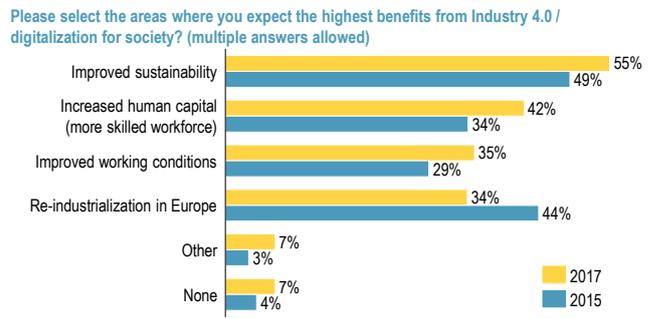


Figure 15 – Areas of highest benefits on society by the PPP industry

Asking about process and functional benefits in more detail² the greatest commercial benefit from Industry 4.0 are seen in dynamic production & logistics planning and in data-based decision-making support. Overall, all the listed benefits are considered at least by two-thirds of respondents as "High" or "Very high" (Figure 16).

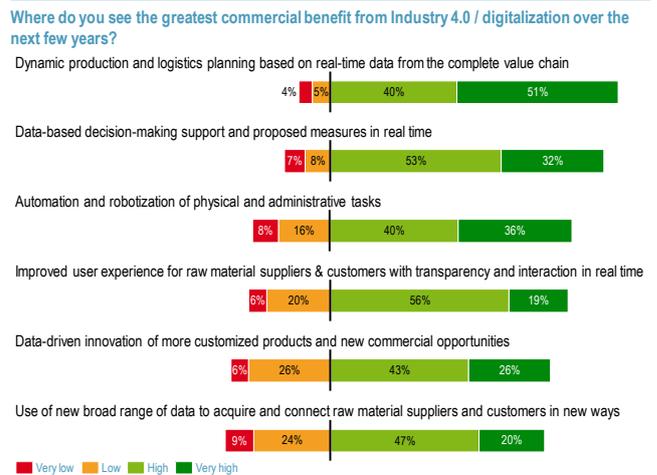


Figure 16 – Greatest I4.0 future commercial benefits by the PPP industry

² Similar question to question #5.1 from: The Forestry Industry's: IT Barometer 2017; Tieto Sweden

Benchmarking with other industries – self-delusion or reality?

The Pulp, Paper and Packaging industry shows more self-confidence when comparing itself to other industries in terms of Industry 4.0. 22% even believe the PPP industry to be performing better than other industries. On the other hand, 35% of respondents believe Pulp, Paper and Packaging is lagging (Figure 17).

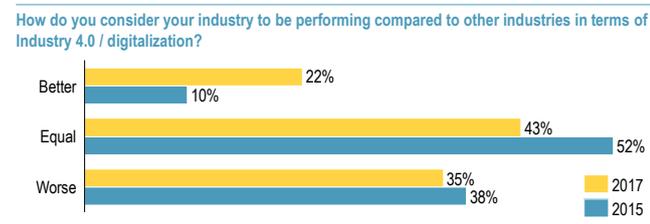


Figure 17 – Pulp, Paper and Packaging industry's self-assessment

When comparing to other industries, Automotive is considered to be the industry which is most advanced in terms of Industry 4.0 by the participants, followed by Automation & IT and eCommerce. Within the PPP industry, Packaging, Paper & Board and Forestry are leading, although all sectors of PPP are trailing far behind the leaders (Figure 18).

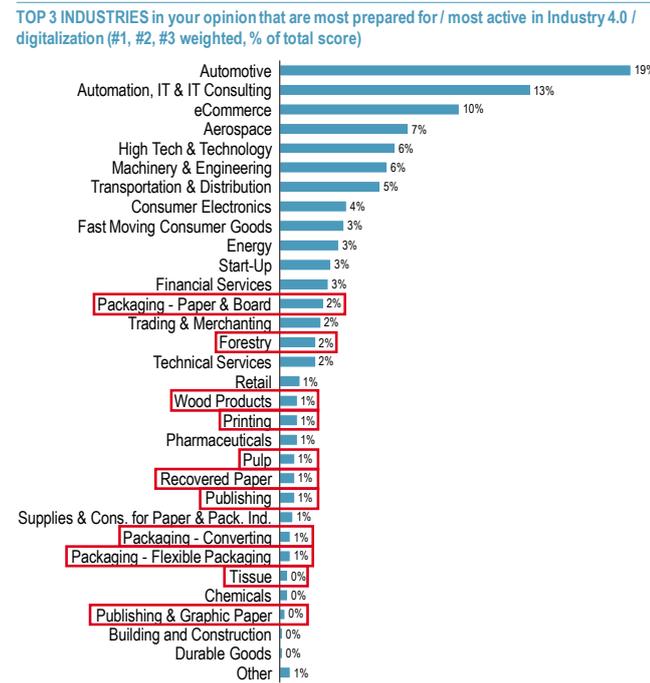


Figure 18 – Industries most prepared for Industry 4.0

In the regional ranking in Figure 19, North America is considered the most prepared region for Industry 4.0 by 24% of respondents. Western Europe (20%) and China (17%), Japan (17%) and Northern Europe (16%) follow.

TOP 3 REGIONS in your opinion are most prepared for / most active in Industry 4.0 / digitalization (#1, #2, #3 weighted, % of total score)

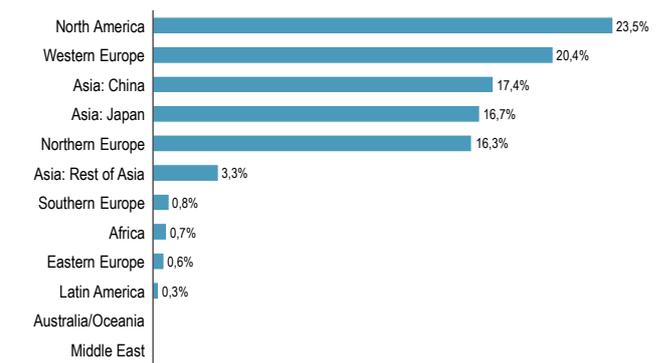


Figure 19 – Regions most prepared for Industry 4.0

Readiness of PPP by Industry 4.0 pillar

The following figures (Figure 20 - Figure 24) show more details of respondents from the Pulp, Paper and Packaging industry regarding their readiness by Industry 4.0 pillar.

Overall, around 50% of respondents consider PPP to be “Somewhat prepared” for Industry 4.0. The picture is very similar for the 5 pillars of Industry 4.0 with some exception of Smart products and Smart equipment. In these categories, the share of “Not prepared” is 35% for Smart products and 21% for Smart equipment compared to around 10% result in the rest of the pillars. On the positive side, Data analytics is considered by 43% as “Prepared” or “Very prepared” in 2017. By comparing the results with the 2015 study, some improvement can be seen, although there are some negative changes visible as well.

How would you rate the pulp, paper and packaging industry's readiness for Industry 4.0 in terms of SMART EQUIPMENT?

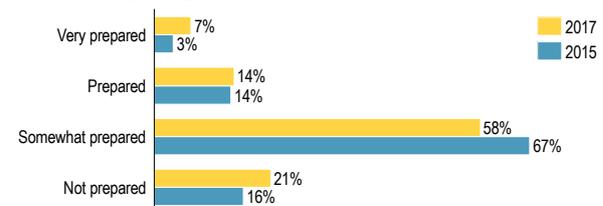


Figure 20 – Readiness for smart equipment

How would you rate the pulp, paper and packaging industry's readiness for Industry 4.0 in terms of NETWORKING AND CONNECTIVITY?

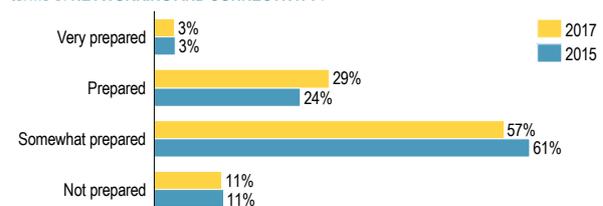


Figure 21 – Readiness for networking and connectivity

How would you rate the pulp, paper and packaging industry's readiness for Industry 4.0 in terms of VALUE CHAIN INTEGRATION?

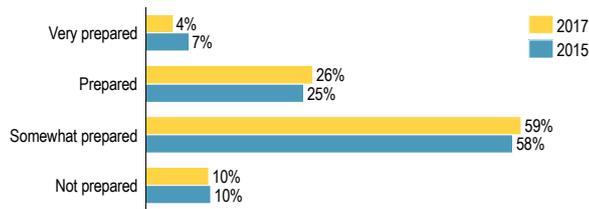


Figure 22 – Readiness for value chain integration

How would you rate the pulp, paper and packaging industry's readiness for Industry 4.0 in terms of SMART PRODUCTS?

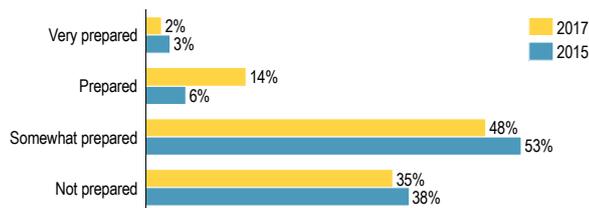


Figure 23 – Readiness for smart products

How would you rate the pulp, paper and packaging industry's readiness for Industry 4.0 in terms of DATA ANALYTICS?

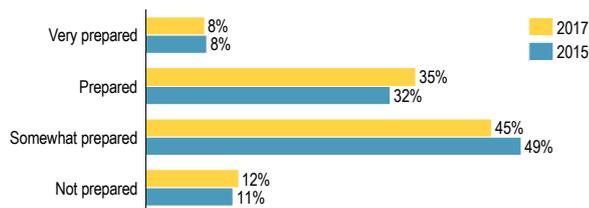


Figure 24 – Readiness for data analytics readiness

Further opportunities in the value chain integration are seen within the PPP industry by 86% of respondents, which is slightly higher than in 2015 (Figure 25).

Do you see opportunities in further value chain integration within the paper and packaging industry?

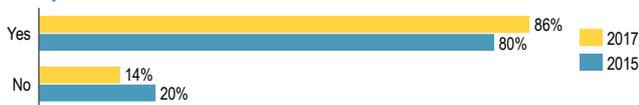


Figure 25 – Opportunities in further value chain integration by the PPP industry

Barriers to implementation

The two greatest challenges in 2017 to implement Industry 4.0 have remained the same compared to 2015. Identifying opportunities & calculating ROI (50%) and changing the existing process/work organization (47%, drop by 6pp) are the

leading obstacles. The overall picture is similar to 2015 with some changes. The biggest differences compared to 2015 are the perception about implementing common technical standards (-15pp) and existing policies (-10pp), which are considered as less challenging in 2017 (Figure 26). Some improvements seem to have been achieved in the areas of ensuring data security and protection (-5pp). At the same time, IT systems and infrastructure (+10pp) as well as education and training of resources (+4pp) are considered among the top 2 greatest challenges by an increased number of participants in 2017. The specificity of these barriers signals that companies are more deeply involved in the topic compared to 2015.

In your opinion, from a company perspective, what are the 3 GREATEST CHALLENGES / BARRIERS to implementing Industry 4.0 / digitalization? (multiple answers allowed)

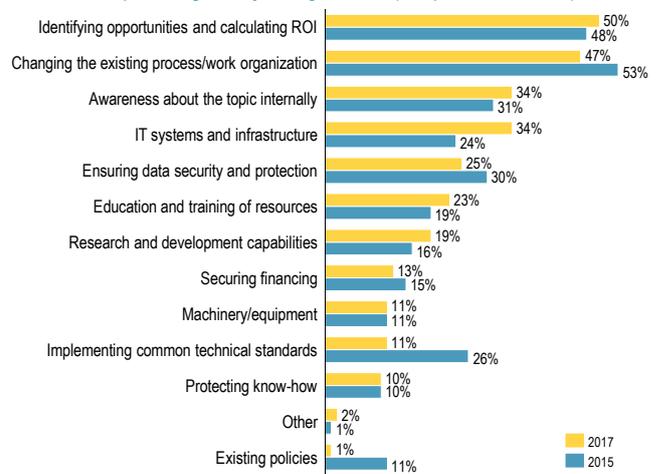


Figure 26 – Greatest challenges to implementing I4.0 by the PPP industry

With regards to the most important steps necessary to implement Industry 4.0 (Figure 27), both in 2017 and 2015 the identification of Industry 4.0 related opportunities (65% and 70% respectively), a roadmap creation (56% with an increase of 20pp in comparison to 2015) and clear communication of opportunities (42%) are seen as the key items.

In your opinion, from an industry perspective, what are the 3 MOST IMPORTANT STEPS that need to be taken to move forward towards Industry 4.0 / digitalization? (multiple answers)

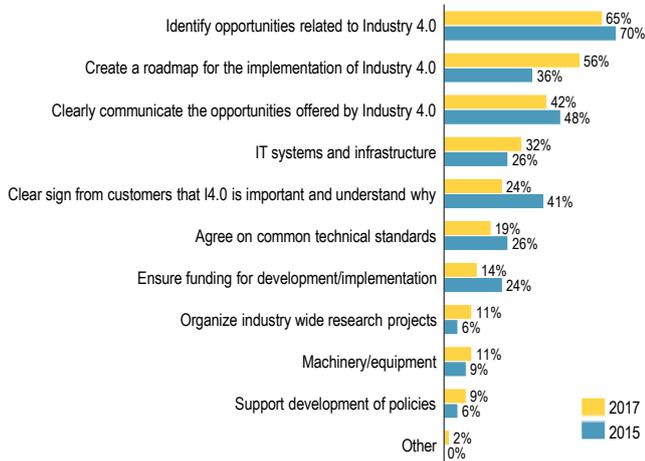


Figure 27 – Most important steps towards I4.0 by the PPP industry

In terms of government support the majority of respondents, both within and outside of the PPP industry, see a lack of government support in terms for Industry 4.0 (Figure 28).

Do you think that the governments are doing enough to support the transition to Industry 4.0?



Figure 28 – Government support

When asked about the areas where respondents would see government support as beneficial, research and development is the area where all respondents would appreciate governmental support (42% PPP / 46% outside of PPP). Data security & protection, common technical standards and protecting know-how are considered more important by non-PPP respondents. In the PPP industry education & training and awareness about the topic are considered further areas where government support would be beneficial (Figure 29).

In what areas do you think it would be beneficial to have more support from the governments? (multiple answers allowed)

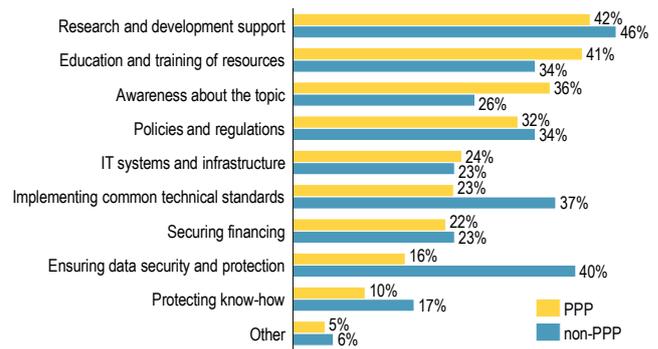


Figure 29 – Areas where government support is perceived as beneficial

Summary

The digital revolution is already taking place and will most likely be a game changer for many industries. At the same time, it will also become a new paradigm that will redefine the competitiveness of industries and nations. Overall, the Pulp, Paper and Packaging industry is not considered the driver for Industry 4.0 despite the improvements and positive trend compared to 2015. Industry stakeholders have high expectations and see many potential benefits to be captured from Industry 4.0 although the topic is not a top priority of most companies. Overall the study shows that the awareness has increased since 2015. While specific projects might still be scarce, the maturity has moved a step further. Self-perception of the industry about its readiness seems to be higher than the ranking of the forest products sector shows in comparison to other industries. North America, Europe and China are considered the most advanced regions in terms of digital readiness. Developing proof of concept and pilot projects with limited investment can help to overcome the key barriers and justify ROI.

By definition, collaboration is required along the value chain to include suppliers and customers to create interconnectivity. The majority of companies are striving for cost reduction but do not prioritize Industry 4.0. Industry 4.0 has the potential to become a driver and even a necessity for next level cost reduction. At the same time, digitalization can support the increasingly relevant sustainability aspects. By driving energy efficiency, both aspects can be addressed. There are still many steps to be taken for Pulp, Paper and Packaging to go digital as an industry. While some support from government can be expected the industry will have to develop leapfrog operating models itself to demonstrate the feasibility. While the direction is clear, exact paths are yet to be discovered and some risk may have to be taken to navigate in uncharted territories.



About StepChange Consulting

StepChange is an industry focused and independent management consulting company with a proven track record in supporting clients to achieve sustainable value. StepChange provides support to top tier organizations in the industry from strategy development to implementation of operational improvements.

With an international team of industry experts StepChange hits the ground running. StepChange provides innovative and yet pragmatic solutions, placing an emphasis on delivering measurable business results.

For further inquiries and comments regarding this Point of View please contact us at leapfrog@stepchange.com.

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