First Stakeholder´s Forum for the Digitising European Industry Initiative

31st January 2017 and 1st February 2017

Grand Hall – Kokereiallee, Zeche Zollverein, Essen, Germany

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Disclaimer: this document intends to report the opinions expressed by participants during the Stakeholder´s Forum, which do not necessarily represent the view of the European Commission on the subject.

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Executive Summary

The **Stakeholder Forum** was the first large public event dedicated to the "**Digitising European Industry**" initiative, and was hosted by the German Federal Ministry for Economic Affairs and Energy (BMWi).

The overall objective of the initiative was clearly expressed from the European Commission: make sure that **every business in Europe** of whatever size and in whichever sector and wherever situated can take **full benefit of digital innovations** in its products, processes and business models. The event aimed at discussing how to make this vision a reality.

Societal impact of digitisation, namely on the **job market**, was a key subject of discussion. Participants are fully aware of the danger that digitisation of our economies **might results in loss of jobs**, high unemployment and emergence of excessive inequalities. The problem is clearly understood at all levels. Solutions will be linked to development of **digital skills** and know-how, e.g. through partnerships in education between industry, academia, and vocational education partners, but in the long term more jobs will be available **only if Europe increases its global competitiveness**.

EU-level collaboration is clearly seen as a "must do": there are countries more advanced in digitisation of industry while others are just starting, but even the strongest cannot be successful alone. In this context, the **European Platform of National Initiatives** will be very important for exchanging best practices between national and EU-level digitalisation initiatives and helping the pooling of resources and co-investments.

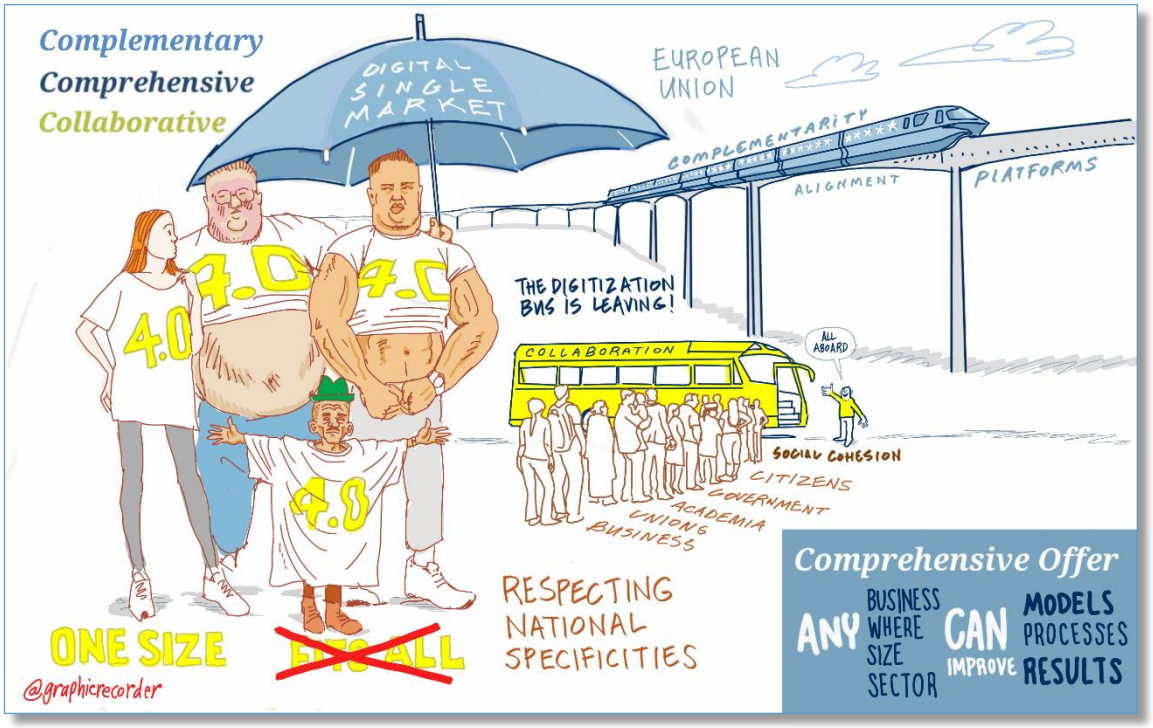
There is **no "one size fits all" solution** possible. Every Member State and Region in Europe has to design and implement their own solution based on local specificities. EU-level intervention is, however, necessary to **coordinate activities**, and namely to create a **European network of Digital Innovation Hubs** which can share competencies and avoid duplication of efforts, according to smart specialization principles.

There was a clear **willingness and commitment** of Member States, industry and social partners to work together with the Commission on building leadership in next generation core **technologies and platforms**. The various Public-Private Partnerships (**PPP**) launched by the European Commission can **ensure leadership** in their respective domains.

Standards are competitive weapons for industry. A framework for common understanding already exists with RAMI 4.0; it is now important to align standardisation strategy with priorities in Cloud Computing, Internet of Things, 5G, Cybersecurity and Big Data. **Security** is such an important aspect that it **cannot be treated separately**; it hits RAMI 4.0 at all levels and is a condition for multi-homed industrial data platforms operation.

Good regulation and legal certainty are prerequisites for investments, especially in areas like data use and ownership, free flow of data, liability and security. **Legislative proposals** aiming at creating a true Digital Single Market and a thriving European data economy are now under discussion. Stakeholders expressed broad consensus on the need to **avoid very restrictive regulation** at this stage, leaving to businesses the "freedom of contract" especially in the B2B area.

Executive Summary – a graphical representation of some key concepts



Key concepts: European DEI strategy ***complementary*** to Members States and Regions with a ***comprehensive*** package of policies respecting differences across Member States and fostering ***collaboration*** and dialogue for all stakeholders

1 – Introduction

The First Stakeholder´s Forum for the Digitising European Industry initiative took place on 31st January 2017 and 1st February 2017. This public yearly event was co-organised by EC and German Federal Ministry for Economic Affairs and Energy (BMWi), and it is the pivotal European conference to address, interlink and consult stakeholders from the entire digital value chain. The stakeholder meeting is a key element in the DEI ("digitising European industry" initiative) governance. 500 people met in Zeche Zollverein, the ancient coal mine area of Essen (Germany), to discuss how to make European industry digital and fit for future. The event stressed the need for EU-level cooperation and the importance of digital know-how and skills for the jobs of the future.

The DEI governance framework facilitates the coordination of EU, national and regional initiatives on digitisation. It mobilises stakeholders and resources across the value chain on actions towards the achievement of a Digital Single Market, building upon existing multi-stakeholders dialogues. The governance model considers various mechanisms:

- The organisation, twice a year, of high-level **Roundtables** of representatives of Member States' initiatives, industry leaders, and social partners ensuring a continuous EU-wide dialogue.
- Preparatory activities are developed, in specific **Working Groups** on Digital Innovation Hubs (DIH) and Leadership in Digital Technologies and Digital Industrial Platforms. addressing both sector-specific and cross-sector issues.
- A yearly **European stakeholder forum** for wider consultation and outreach involving stakeholders from the full digital value chains.

The Stakeholder´s Forum was the first in a series of yearly events; it was organised as a two-day event, with plenary sessions taking place on the 31st January 2017 and parallel workshops being organised on 1st February 2017. High-level policy debates on DEI focused activities in the first day, while national initiatives on digitisation of industry and Industry 4.0 and series of workshops on digital innovation hubs, digital industrial platforms, standardisation, skills for the digital age, IT security and regulatory challenges focused the debate among stakeholder´s the second day. All along the discussions the focus on Small and Medium Enterprises (SME) was very clear, as well as the inclusiveness of the initiative at the citizen level.

The overall objective was clearly expressed from the European Commission: we want to make sure that every business in Europe of whatever size and in whichever sector and wherever situated can take full benefit of digital innovations in its products, processes and business models.

This report summarises the findings of the Forum as well as providing the right pointers to the activities of the two active Working Groups on DIH and leadership in digital technologies and digital industrial platforms.

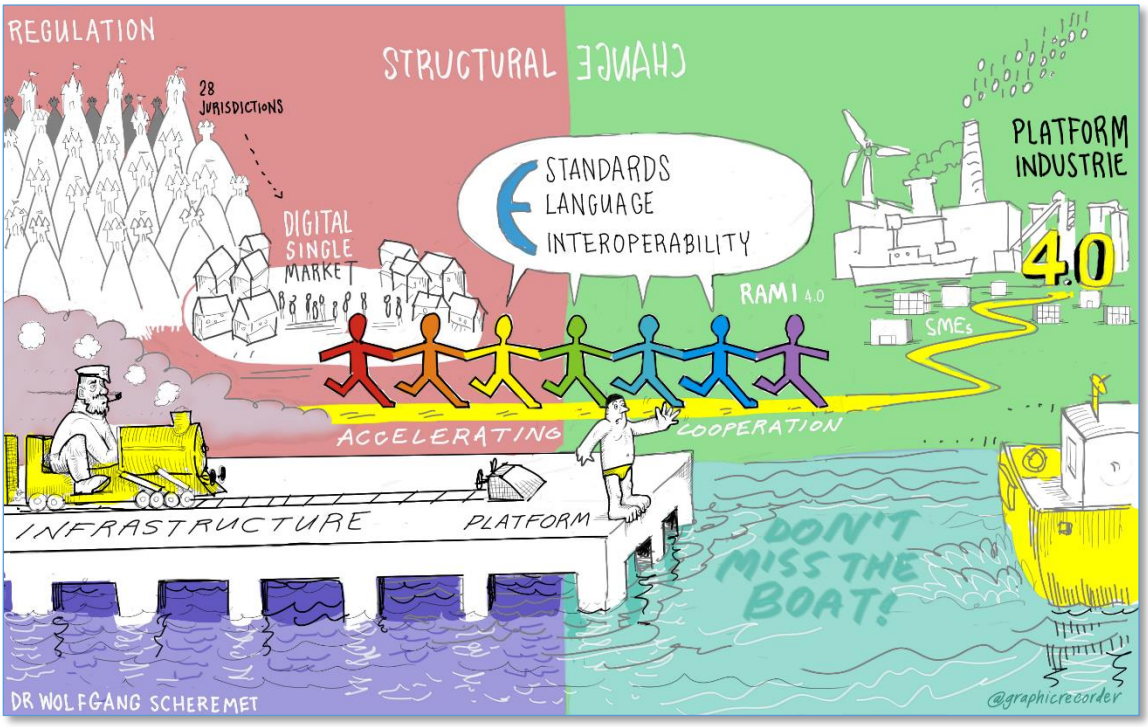
The report is organised in 5 Sections, including this introduction as Section 1.

- Section 2 focuses on the **high-level political debate** on DEI and the national initiatives on digitising industry.
- Section 3 is about **National initiatives** and their activities.
- Section 4 focuses on the main **outcomes of the workshops** on the various strategic dimensions of DEI.
- Section 5 draws the **main conclusions** from the event.

2 – High-level Policies on DEI

2.1 – Keynotes

The First Stakeholder´s Forum for the Digitising European Industry was opened by a session of keynote presentations made by **Dr. Wolfgang Scheremet**, Director General Industrial Policy at the German Federal Ministry for Economic Affairs and Energy on *"European cooperation to accelerate the digitisation of industry*" followed by a speech by **Dr. Christian Cardona**, Minister for the Economy, Investment and Small Business from Malta on *"Digitising European Industry: the view of the Maltese Presidency"* finally wrapped up by a keynote speech by **Khalil Rouhana**, Deputy Director-General, European Commission from DG Connect on "*Digitising European Industry: State of the Initiative"*. This view was complemented on the second day opening by a keynote speech from **Stefan Schaible**, Deputy CEO at Roland Berger on "*State of Digitization in Europe"*.



Digital Structural Change: Coherent set of action lines towards a ***Digital Single Market*** (DSM) leveraging on ***global standards***, interoperability, European digital regulation and ***digital infrastructures and platforms*** to drive Industrial Digital Transformation from large industry to ***SMEs***

Highlights: The Stakeholder´s Forum clearly highlighted that views from industry, flagship national initiatives and European strategies in digitising European Industries are aligned and **a common vision is shared**.

All stakeholders agree on the importance of intensifying collaboration and focusing on the need for action and development of the shared strategy along actions lines that include:

- the development of **smart regulation**,
- an active participation in setting up **digital standards** rooted on large-scale cross-border experimentation of autonomous systems,
- leadership in the development of global **digital industrial (data) platforms**,
- **world-class pan European infrastructures** supporting the above platforms.

In this process, Europe should collectively shape future **digital skills** of its workforce and the digital jobs in **an inclusive way**, ensuring that **any enterprise, irrespective of size or location** has access to the required competences and skills to develop smart products, advanced intelligent manufacturing processes and digital business models.

The development of a **strong infrastructure of Digital Innovation Hubs** across Europe in **coordination with Member States investment** plays a key role in this vision.

European policies should move away from protectionism and support **open approaches and platforms** to master a servitised industrial economy with a clear customer focus that builds on the **market and competence strengths** of a European industry which is leader in several industrial sectors.

Dr. Wolfgang Scheremet

The initial keynote by **Dr Wolfgang Scheremet** set very clearly that nothing is as constant as structural change. A living example is the region of Ruhr where the very same event had taken place. The region of Ruhr has gone through 50 years of structural change and continues. The process of industrial digitization plays a vital role in a new step of digital transformation

The digital transformation is already on-going with profound changes in the way we work, travel and spend our daily life. It strengthens wealth in Europe and actively shapes the structural change. Many Members states have strategies and initiatives or are rapidly setting them up.

In Germany, the Industry 4.0 initiative is the flagship platform for industrial digitisation. The joint objective is to establish links between these national initiatives across the EU. Fostering European and international cooperation is essential. Digitisation is not limited to decision-making at national level. Therefore, agreed and aligned measures need to be taken with no delay.

Such measures should be structured along 5 main pillars:

- A single digital market,
- Solid digital infrastructures,
- European framework for digital industrial (data) platforms,
- Intense standardization and regulatory activities,
- Active support of SMEs.

A digital single market. China and US do not perform better because of the particular suppliers or customers that are placed in such parts of the world. Now industry is a global movement. They experience **one single (digital) market**, this is their competitive advantage. On the contrary, an EU of many different languages and 28 digital markets is the current reality.

A true digital market in EU is a prerequisite for new strategies and business models. EU Digital market is estimated as GDP surplus of 415 B€ and 100.000 million jobs per year. However, until our market will remain fragmented, investments will be less attractive. The DEI communication and the digital data package are undoubtedly a good impulse. However, this needs to be pushed across the Member States.

The **digital infrastructure** is the backbone of the digital economy. High speed broadband is needed to foster innovation and growth. The challenge is to create an attractive framework for private investments in digital infrastructures. Moreover, digital infrastructures should not represent a digital divide for rural economic growth. The European approach should ensure that all SMEs, irrespective of their location, get full access to broadband.

Europe should take a leading position in the next **digital manufacturing (data) platform** landscape. Facebook holds 1.7 billion monthly active users, 300.000 more than the population of China. In 2015, Apple generated revenue totalling 233 billion US dollars. This figure is equivalent to the gross domestic product of a medium-sized country such as Finland. Platform operators in and around the Silicon Valley alone account for more than 50%of the cumulative market capitalisation of all platforms worldwide. By contrast, European companies currently account for less than 5% of the global market value of digital platforms. In parallel, Asian providers are growing fast.

Digital platforms fundamentally change the operations of markets. Germany has started a broad discussion on digital platforms through the elaboration of a Green paper. This should be complemented by a white paper on regulatory framework that shall follow and contribute to EU dialogue.

Internet of Things (IoT) is at the core of Industry 4.0, along with machine to machine (M2M), plant to plant and machine to human communication. It is of great importance that all speak the same language. **Internationally agreed standards** are needed for interoperability and for an interconnected industry 4.0. EU companies should heavily contribute to international standards. If we do not actively look and step in into these international forums, European industries will be in disadvantage. Industrie 4.0 has developed **RAMI 4.0** which gained a lot of international attention and could serve as a **model for a global reference architecture**.

Finally, **SMEs should and could not be set aside in this transformation process**. They are fundamental elements in the European industrial ecosystem and they hold critical know-how on how to improve and optimize technology and manufacturing processes. But they lack the new digital business model perspective. To that end, the German Federal Ministry for Economic Affairs and Energy established eleven **Mittelstand 4.0 Competence Centres** last year. They aim at gathering and pooling practical knowledge for the application and economic use of digital knowledge and technologies and of Industrie 4.0 applications in SMEs and the crafts sector.

It is clear that digital revolution is here and it is global. **Digital transformation cannot be avoided**. The digital transformation of industry demands **concerted action within Europe**. Digital technologies have to be adopted across the economy and industry in all sectors as quickly as possible. Cooperation on a European and international level is essential to accelerate this process.

Dr. Christian Cardona

The initial keynote was followed by the insights from **Dr. Christian Cardona** and the Maltese presidency on digital transformation and the impact on national strategies and growth.

The digital transformation is not a national strategy, it is a global one built on relationships such as the special one built across countries such as Malta and Germany. Malta has succeeded into a transformation towards a multi-sectorial vibrant economy. Industry is at the core of the policy making process of EU. The prominent place that industrial policy now plays in the EU level along with the strategic importance of a full digital transformation of European industry, calls for concrete actions to strengthen and modernize the Single Market. It is important to notice that **EU will take both a sectorial and horizontal approach towards industry digitisation bringing forward richer digital ecosystems**. The need for pragmatic approaches is key to safeguard the competitive advantage and the environment for business certainty and long term investments. Such pre-condition is of capital importance to ensure that all member states

benefit from the digital transformation. Innovation and digitisation are now bounded together, as a duo for economic growth and quality of jobs. The smart combination of start-up, scale-up, access to finance and DEI is paramount to the medium to long term digital transformation. In fact, the Maltese government welcomes national initiatives such as German "Industrie 4.0" and European ones such as DEI adopted last year. They will play a key role to ensure the evolution of Maltese economy from a labour-intensive manufacturing into a *servitised* industry.

Finally, it is very important to highlight the importance of possessing the right skills to ensure the right investments in the Member States and therefore the creation of good quality jobs. The e-skills Maltese foundation is an example of how cultivating ICT skills could be fundamental to sustain a digital economy. The Foundation supports incentives, standards and investments to be competitive, since regions all over the globe are aggressively moving into a digital economy. The priority is to rejuvenate the digital economy with new products and processes, thereby raising awareness at all levels of society to come up with new initiatives and public private partnerships (PPP) and support future-proof legislation and investments in human capital.

Khalil Rouhana

The set of keynotes was closed with an intervention from **Khalil Rouhana**, Deputy Director-General of DG Connect, who again emphasised the role of structural change, the fact that we are now digital and the need for new European perspectives driven by technology and innovation. Europe willingness to move ahead cannot be disputed. The community of stakeholders along the value chain gathered around the Stakeholder´s Forum is instrumental in this respect with representatives from industry and national initiatives are present. March 23rd will also be an important milestone with the official launch of the platform of national initiatives for digital transformation, coinciding with the 60th anniversary celebration of the treaty of Rome.

For DEI to deliver the anticipated impact on the economy and wellbeing of European citizens, it is important to synchronise and leverage on what can be done locally, by EU, by industry and by governments in a concerted effort and strategy. The DEI governance framework is now in place as a dynamic framework for cooperation across and among Member States and EU to work together. In 19th April 2016, the EC announced the objective of the DEI strategy, namely that any company anywhere in Europe, even far from traditional business centres, is empowered to develop innovative and valuable products and services. **In this strategic objective, every word counts**. This is the EU approach, comprehensive and addressing all sectors. DEI is a big opportunity. The comprehensiveness up-raises value creation across Europe and guarantees the best for citizens and business. However, digital transformation can also be perceived as a big threat to large parts of business and citizenship. **So, the EU strategy should address both sides of the digital transformation**. Both opportunities and threats are behind all actions towards digital transformation.

DEI strategy pays particular attention to a successful and inclusive digital transformation of European jobs and skills. DEI is therefore supporting the development of a strategy for the modernization of jobs and skills. This pillar of the overall DEI strategy is a very important one. DEI is proposing an area where Member States have to take the lead. EU can be the forum to share best practices and for this purpose the Digital Skills and Job Coalition has been launched; specifically, to contribute in adapting the European workforce and their associated digital skills.

The DEI strategy also actively develops the regulatory framework activity line. EU digital regulation is needed to unlock the barriers to development e.g. in the areas of data ownership, free flow of data, liability and security, autonomous systems. The data package is key for data access, portability, liability, in particular taking into consideration machine-generated data in future digital products and services. Europe is analysing the current regulatory framework. The analysis is paying particular attention to the needs for liability and security. This is being done through setting the foundations for cross-border experimentation and testing in areas where Europe needs to roll out future autonomous systems. On the security side, legislation needs to take into account the certification of digitally enabled products and services.

The DEI strategy has already defined 16 measures regarding the DSM, which are strategic to achieve it. Once identified, in the next two years we need to focus on delivering such strategic measures. Indeed, Member States and the European Parliament should get swift decisions on the realization of the DSM.

Finally, the DEI strategy is also taking a bottom up approach. DEI acknowledges the importance for any industry to get access to technology, to be able to experiment with it, to assess the associated burdens and evaluate the transformation impacts and Return on Investment (RoI). Industry needs to go through these steps before they make the decision of fully engaging and adopting digital products and services. It is absolutely important that any region in Europe has access to skills and competences for test and experimentation of digital products and services. This is the concept behind Digital Innovation Hubs (DIH). It is not possible that all competences required for a digital transformation are covered by a single competence center or stakeholder. Therefore, for EU wide adoption it is important to deliver a rich network of competencies as a one stop shop for modernization of product, process or business model. The objective is now to collaborate in setting a world-class infrastructure of DIHs. The EU will invest 500M€ to build and experiment on this pillar of the industrial digital transformation, but EU level investment is not sufficient. Member States and regions need to invest in the development of such competences and DIH infrastructures. 150 Competence Centers are already in place and additional 100 more will be set to ensure that DIH reach out all of Europe. New member states need to be reinforced. Moreover, 50 Competence Centers will be established in the year to come, primarily in peripheral Member States.

Europe is present in all the key elements in the digital technology chain. Europe should now integrate the technology blocks to create the platforms that industry needs. Connecting Europe Facilities will also play a key role in realizing this objective, rolling out the components to the operation of integrated systems, processes and platforms. The need for Factories of the Future standardization is now an urgent issue. The size of investments planned for High Performance Computing (HPC), connected car, factories of the future are at the size of investments needed to lead (50B€ over the next 5 years). For a successful outcome, it is imperative that Member States join forces in the form that they are doing and continue to scale-up their investments. European DEI strategy will be a success through the materialization of such collective and cooperative effort; seizing the opportunities that Digital transformation can offer.

Stefan Schaible

On the second day **Stefan Schaible** provided a thorough view on the industrial perspective of digital industry policies.

Silicon Valley industry has a strong strength in marketing digital products and technology. Tesla is one of the latest examples with Europe driving the technology development but Tesla being able to capture media and mass attention. Therefore, Europe can compete in many dimensions on the digital transformation arena and European industry should no undervalue their inherent achievements and strengths.

Digitisation is already embedded within our daily lives. However, bigger transformation waits in the business world. A recent study performed by BDI on the economic potential of digital transformation in 8 key industries reveals that digital transformation could add as much as 1250 billion € in a 5-year period.

European industrial footprint and competence is undeniable. Automated production is led by EU companies not only for large companies but also for medium and small businesses and for a wide range of sectors. To keep such leading position in industry and digitisation, Europe needs to invest. ICT talent is also strong in EU, with 5 key EU institutions in the top worldwide ranking. Moreover, EU holds a unique and differential characteristic, since EU developers are not concentrated in few hubs but distributed across EU. Western education must prepare better our kids for a digital future and society to cultivate our differential assets. Skills demanded for a

digital world will change and new demands will emerge. The ability to transfer knowledge and creativity will become more valuable skills in the context of digital society and industry. Therefore, digitisation has social implications for transformation and economic development. Digital technologies, products and services transform the way we work and live. Digital transformation will make some jobs redundant but on the contrary, it will make new jobs be created. Europe should drive a social all-inclusive strategy to steer the way our society adapts to the digital future without letting people behind.

China and USA acknowledge EU leadership in robotics and production automation; following EU activities in this particular domain. However, industrial digitisation goes beyond the factory and Industry 4.0. **It is not just efficiency and optimisation. It is a customer focus, new digital business models.** The B2B segment will converge into big yet diverse digital manufacturing platforms. Moreover, industrial digital platforms will differentiate from B2C platforms in that they should not just be driven by business to consumer intermediation but be driven by data value generation.

Europe has already lost the customer digital platform battle. Europe should not repeat this on industry, where it is leading deep technology development and procurement. **Industrial digital leadership will be driven by the ability to complement digital platforms with data driven business models.** Digital leadership is also about engaging the complete digital and manufacturing ecosystem. Digitisation should not be restricted to address the needs of digitally native start-ups. On the contrary, the objective should also address successfully challenging the existing and stablished business practices in our traditional business fabric. At the same time, digital transformation is not just an employer's endeavour. Employees also take a significant and active role, and open innovation enterprise ecosystems for digital transformation should be designed to foster the emergence of digital initiatives as part of the corporate strategies.

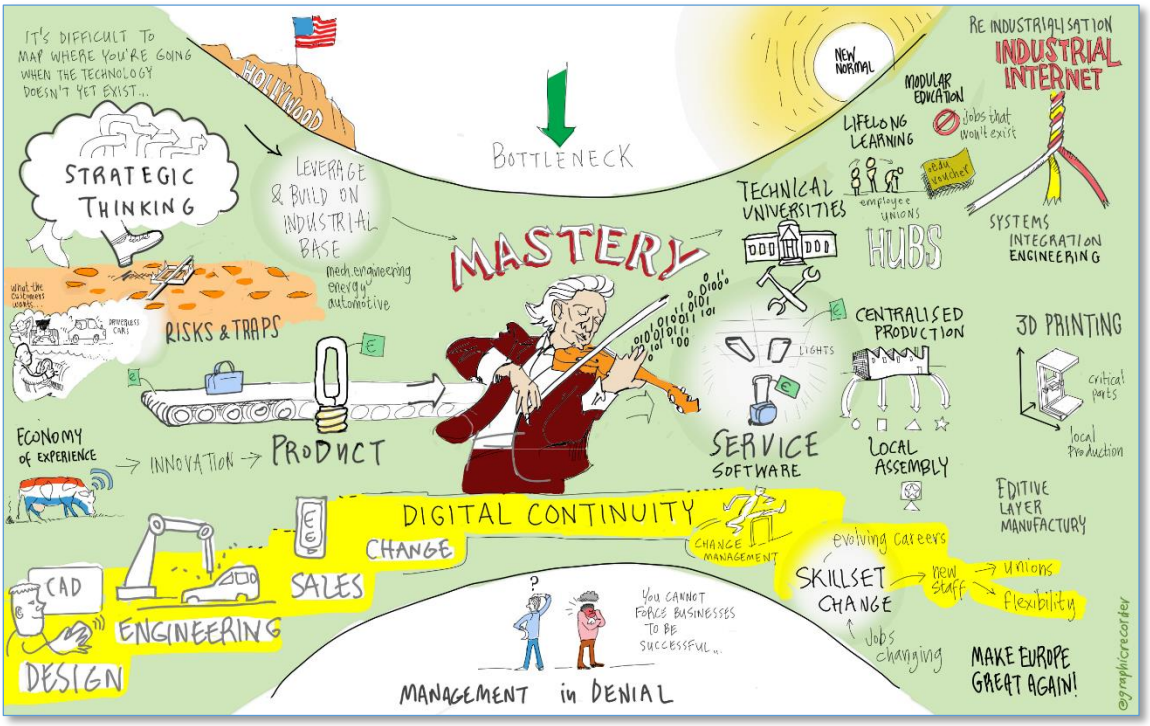
In the process of mastering the digital transformation, Europe should make the right steps at the political level. DSM is a priority at the EU level, as a key strategy to remain competitive in a global market. Europe should make a clear commitment to become more competitive by merging digital talent with industrial strength and ensure a fair play in the digital arena moving away from protectionism. Therefore, Europe should adjust and advance the digital regulatory framework advocating for self-management. Current status quo is such that industrial goods produced in Europe are traded against US B2C digital platforms. However, in the digital transformation, every business should be granted access to digital platforms under non-discriminatory conditions. Setting up international alliances that break monopolies is of great importance.

Venture capital is important to drive and capitalise on the digital transformation. Europe faces a challenge in making sure that the financial framework makes attractive for private funding a significant and timely investment on European digital technologies and industry.

2.1 – Mastering Digital Transformation of European Industry

The set of initial keynotes was followed by a first panel on Mastering the Digitisation of Industry in Europe – How to Allow SMEs and Large Enterprises to Compete on a Global Scale.

The panel hosted *Laurent Blanchard*, Executive Vice President of Dassault Systèmes, *Ineke Dezentjé Hamming-Bluemink*, President of Employers Association FME, *Tomas Hedenborg*, President, Orgalime and *Peter Olson*, VP & Head of European Affairs, Ericsson



Mastering Digital Continuity in Europe: European industrial leadership through ***lifelong learning*** and ***trusted free flow of data*** across product and process lifecycle. Targets: digital business innovation, manufacturing servitization, new production capabilities in Europe and ***multisided digital platforms*** ecosystems.

Highlights: Transformation of European industry will be linked to the ability to master digital continuity and experience economy at all levels; i.e. at organisational, workforce, technology, business and policy levels.

Digital transformation will bring new opportunities to rethink value chains and business models along with production and manufacturing strategies and capabilities. Production will still remain a highly significant activity. However, customisation and servitisation of products and processes, which are eminently a digital asset, will gain a more prominent role in traditional industry business operations.

The digital transformation and the continuous evolution of the product capacities through smart services will demand the adoption of life-long learning as the norm for workforce mastering of digital operations.

Outcome-based business models and value-driven hyper-connected products bring forward a "do or die" scenario towards digital transformation. There is a need for swift and dedicated action for European SMEs, including transformation support for Industry

4.0 culture adoption, change management, informed and strategic decision making on the use of new digital tools, technologies and business models.

Industry 4.0 started as an initiative focusing on production and manufacturing with an objective of time efficiency, reductions of time to market and the agility to produce in the right manner. Now the initiative has grown to address the digitisation needs across all the product and process life-cycle dealing with the digitisation of production: engineering, planning, sales, distribution, servicing and re-cycle/re-use. Europe needs therefore to master **digital continuity as a key digital ecosystem differential factor for SME and large enterprise operation.** Moreover, Western European countries reindustrialization will come with the adoption of disruptive technologies such as 3D printing or additive manufacturing, 3D scanning technologies. These technologies were not even considered for manufacturing a few years ago but today critical parts inside areospace engines are being 3D-printed. Digital transformation will not respond to the mass production challenge. But on the contrary, it will serve the needs of highly customized production needs down to even lot-size-1 production schemes. This implies that European industry through digital transformation has the opportunity to **rethink the complete production value chain** and transform existing manufacturing facilities into cyber-physical production systems, where software and smart digital services play a key role. Manufacturing will most likely remain local. However, what aspects of the product are actually manufactured will change based on the opportunities and capabilities that digital platforms bring to large, medium and small enterprises to share, exchange and exploit digital data across humans and machines.

European excellence in assembly and integration, electronics and automotive sectors, coupled with the increased need for production of smarter devices, requires new collaboration across the value chain. Products will be smarter and more connected. Future manufacturing is not just about assembly and delivery of a product: it is about being able to transform both the behaviour and capabilities of the product across the full life-cycle. This implies both more modular designs and production strategies that take advantage of the capabilities of future digital manufacturing and logistics platforms. The key is that the **product will evolve with new and better uses across its complete life-cycle**. Smart products consist of standard components that are integrated in smart ways and then **specialised tailored solutions are made available to the final customer in the form of smart services**.

Adoption of industry 4.0 technologies, products and services will be finally made by people, both managers and workforce. Hence, Europe needs to make sure that industry 4.0 **culture and change management reach SMEs and large companies** and that management and middle management embrace this digital transformation culture. However, management currently fails to identify the risks of not adopting a strong and focused digital transformation strategy as part of the overall business strategy. European industry needs to realise that **digitalisation represents the access to new tools and adoption of new business models. However, it also represents new ways of making mistakes and therefore a risk of going in the wrong direction**.

Industry 4.0 is accelerating quickly. However, SMEs are not yet sufficiently aware of the change and are therefore lagging behind. In the last 2 years, industry 4.0 awareness across SMEs has grown but not enough. Now that "**do or die" is the digital rule of the game, it is of strategic importance for mastering the digital transformation that SMEs quickly and actively engage.** Those companies who decide not to move along will fall behind.

Digital transformation extends current business models and strategies with a strong service dimension. This is what we call "servitisation", i.e. the ability to establish business models on the basis of the outcome provided by a product rather than on the actual ownership of a particular product. This is a game changer, with the potential to disrupt the role of companies in the value chain. Servitisation, product service systems and ultimately digital transformation imply that software skills and services become new strategic assets in traditional manufacturing businesses. Ultimately, **the outcome of the product is valued and the outcome is connected**

with the ability of the manufacturing companies to build software-based smart services on top of the physical product produced. As a matter of fact, nowadays in an automation company 60% of the workforce is based on software engineers, which is already a profound sign of the change derived from the early stages of the digital transformation. European Telecom industry is a good example on the impact of servitisation on business models and revenues. Telecom industry started earlier in the servitisation of their business models towards the consumer market and nowadays more than half of the business revenues is related to services and more than half of the research expenditure is on software technologies.

Continuous training is not enough. New competences and skills are needed in large industries but particularly in SMEs, to be able to compete on the digital transformation with the right skill sets. Europe has shortage of technical people, and even more a shortage of digital skills.

Lifelong learning needs to be the new normal. Europe has an urgency to redesign and enhance their education and training schemes and stop educating people for jobs that will not exist in the future. Educational systems need to be more agile and keep the pace of technological transformation. Social innovation should help and support this transition. **Digital transformation implies that jobs will not change, will not evolve, they will be transformed since the technical change is fast.** However, transformation will be a gradual process that will build on evolution of legacy production facilities and will incorporate new business models and activities within the industry. Hence, transformation of education and training programmes should follow the technological transformation of the factories, smart products and associated digital business models. It is worth noting that automation has created more jobs than those that the technology destroyed. As the value chains become more agile and the forms of work should also become more agile too.

Traditional industries are lagging behind in the experience economy. US are putting as a top priority of their industry the user experience in the design of the products they manufacture. **Industry needs to get connected with the customer** to be able to deliver better experiences.

Experience economy for the products can be virtualized and modelized with digital industrial platforms that put all this information together. Therefore, **anything that can benefit from being connected will get connected.** Today, shopping, social media and entertainment are the focus of GAFA (Google, Amazon, Facebook and Apple). Industrial Internet development demands that EU gathers market power and focuses were our strengths lay. Europe is **strong in automotive, energy, mechanical engineering markets and we should avoid being *intermediated* by digital platforms in these markets.** The ecosystem of small and large companies is critical to ensure a leadership position from EU companies in future markets. **Europe should focus on facilitating a fully functional industrial digital-data ecosystem working as means for growth and quality jobs**.

2.2 – Societal Challenges in the Digitisation of Industry

Societal challenges: SME readiness for new ***digital business practices***, societal adoption of autonomous systems and data and knowledge governance in ***data-intensive*** digital industrial ecosystems for new ***mass-customisation*** production.

Highlights: Industrial digital transformation should not be decoupled from societal mega-trends such as European demographic change, increased urbanisation and individualization of consumer habits.

Leverage of Industry 4.0 benefits is linked to the acceptance by society in general and workforce in particular of new autonomous systems that will initially disrupt the current job and skill scenario; but in the long term, through increased competitiveness of European Industry, growth and quality digital jobs will be generated.

SME awareness about digital transformation implications and strategic decisions that need to be made are not yet sufficiently high. The role of Digital Innovation Hubs will be decisive to raise awareness and to support SMEs technically, financially and with the right digital talent in their digital transformation.

Clear guidance on how to create value from digital technologies will be critical. New dimensions such as cybersecurity and digital skills that have not been the focus of industrial activities should now be address both from a cultural and an managerial perspective in the organisations.

The first panel was complemented by a second panel on Societal challenges in the digitisation of industry – opportunities and challenges, which hosted *Christian Decker*, CEO of DESMA Schuhmaschinen GmbH, *Prof. Dr.-Ing. Reiner Anderl* from TU Darmstadt, *Luigi Perissich*, Director General of Confindustria Innovative and Technological Services and *Piet Mosterd*

from Field Lab and with a set of inspirational speeches about future visions on digital Industries provided by *Kerstin Eichmann*, Head of Machine Economy Innovation Lighthouse Innogy – Machine Learning for sustainable energy, *Thomas Zeller*, CDO UnternehmerTUM GbmH and *Dirk Mühlenweg*, Head of Sales Global Watson IoT Center – Munich digital eco systems - best practices and outlook and *Sebastian Raßmann*, Senior Innovation Advisor, TrendOne – The World in 2025 – Digital Transformation of Industry

There are general trends in society such as demographic change, urbanization and sustainability that influence the evolution of European industry. Digital transformation is a key enabler to sustain and increase our manufacturing capabilities while addressing such societal challenges. Industry is increasingly driven by the need for customization and shorter lead times. Waste management and energy efficiency of manufacturing are also critical aspects that directly affect European industrial competitiveness. Time to market in the automotive industry is very important. When this is coupled with increasing demands for mass customization, industry demands support from digitisation technologies and digital platforms to help the reorganisation of production strategies and capabilities.

Such reorganization of production capabilities is particularly relevant to SME that demand specific measures to change the business model and become competitive through digitization. This transformation is a process that will take time since manufacturing SMEs hold an industrial background with expertise in the control the production processes but they now need to master the "digital twin" and "digital product" concepts.

Digital transformation has now become a key aspect in the industrial policy development. POLIMI (Politecnico di Milano) observatory reveals that only 10% Italian companies understand they need to rethink the business. They still think about machine procurement, software acquisition. However, digital transformation goes well beyond the specific digital tools and it demands for a business re-organisation.

Digital Innovation Hubs are an instrumental measure to address the need to help traditional companies to digitize, as traditional industries and particularly SMEs represent the root for economic growth of the European territories. de:hub (www.de-hub.digital) is one such early example of how DIH under a *"unique brand"* can support talent, start-ups, entrepreneurship and business scale-up.

A key feature of a DIH is the ability to leverage on neutral and trustful environments to develop the digital industrial ecosystem. Connected to the DIH is the role of competence centres that are able to support with specific competences the development of specific businesses. IBM Watson IoT, based on a 200M€ investment, is the IBM approach to develop their global hub for cognitive manufacturing at the core of Industry 4.0. IBM provides an open campus environment to work with partners in sustainable digital product development with 4 dedicated Labs on automotive, manufacturing, electronics & insurance. BMW is co-located with IBM Watson for the development of the IoT for cognitive car. The value of hubs is their ability to connect key technical and business development competences with policies, regulation, real projects and education.

From a societal perspective, robots will make humans redundant in some tasks but the increased autonomy and automation of Industry 4.0 will also bring new demands for "factories of the future" operation. Jobs are lost when industry loses competitiveness. If European industry remains competitive through Industry 4.0, jobs will remain. Customized design and production beyond the automated and autonomous production infrastructures should not be neglected and undervalued in the context of DEI and Industry 4.0. Industrial digital society faces 3 main challenges:

- **Challenge 1 - Societal acceptance,** which should be connected to new form of robot human collaboration, safety and IT security dimensions and data and privacy protection.

- **Challenge 2 - Change of organizations and work-life**, conditioned by the new workplace environments that will be facilitated by automated manufacturing and digital technologies.
- **Challenge 3 - Competence, skills and qualification**, which are essential to deliver the digital transformation. The workforce will be an integral part of the digital transformation and innovative technologies, work life and organizational changes are enabled by people.

Daily life already hosts a lot of digitized products. This has taken already a long process in terms of societal acceptance. In a similar way, society should carefully consider how industrial digital technologies are brought forward. This process should not be taken for granted even if digital technologies are already part of our daily lives. Moreover, digital transformation is not simply about bringing the technology to the shop floor or the factory. SMEs in many cases already have the technology in the shop floor, but there is not sufficient awareness of their potential. **Digital transformation should be about activating and bringing value to SMEs through the technology made available to their shop floors and factories.**

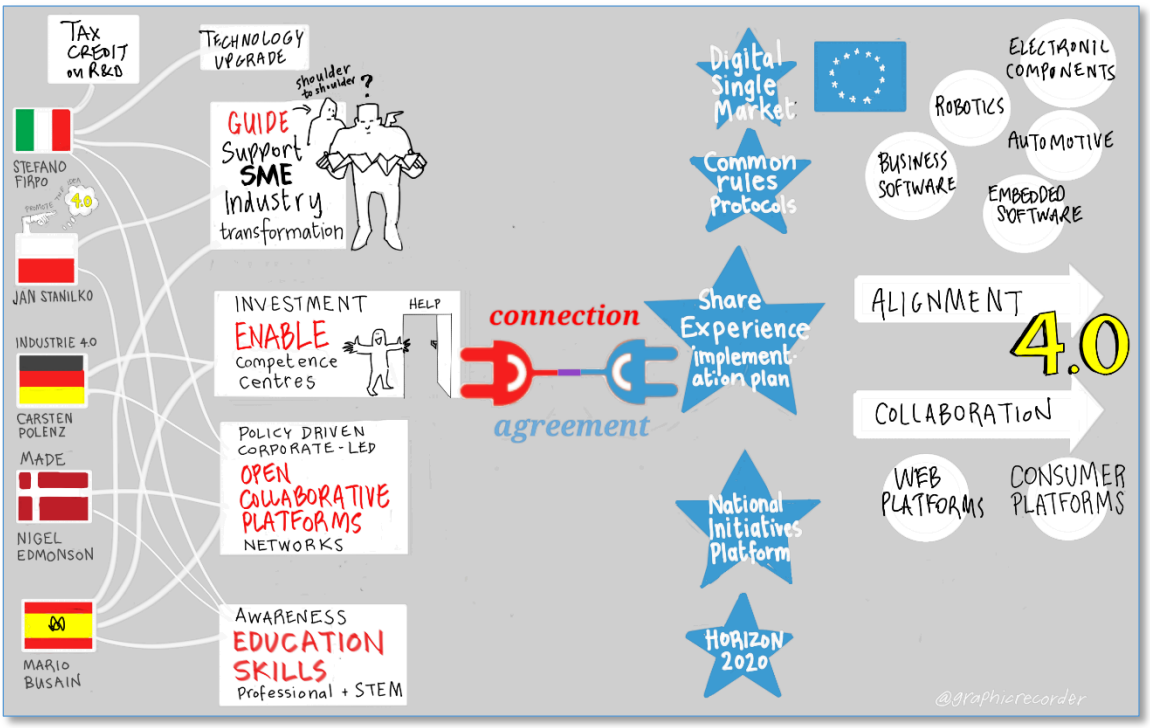
SMEs are already in a good starting position in terms of technology being available at their machines and manufacturing systems. However, sensor data is not exploited, machines interfaced already within equipped machines are not used. What is needed is a **clear guidance for exploiting fully the potential and the capabilities of digital technologies.**

In terms of acceptance of digital technologies and products by SMEs, it is important that sufficient effort is made to ensure that digital technologies are not only connected with the ability to code or programme devices, sensors, machines and robots. Sufficient effort should be put on making sure that adequate human interfaces are developed so **SME workforce can operate industrial digital technologies**. Additionally, industry 4.0 should put a particular emphasis on security and trust that is an instrumental element for the development of SME-inclusive value chains. Security culture in the workforce is not just about technology. It is about establishing a strategy and being able to operate it on the shop floor. Moreover, digital security should not just be cantered on the product but on the complete supply and value chain in itself.

When addressing digital transformation of the value chain and the impact of servitisation on industry one should not neglect the impact of sharing economy model that go hand in hand with the business models associated with servitisation of the physical products.

Sharing economy calls for truly peer to peer platforms that avoid the needs for intermediation. B2C digital platforms are currently dominated by such intermediation business models in many different business sectors; e.g. transport, energy… Digital transformation is bringing forward new technologies such as distributed ledger and blockchain technologies that have the capabilities of truly decentralising operations disrupting current value chains and leveraging a true P2P economy.

3 – National Initiatives in Digitising Industries



National initiatives: National priorities in industrial digitization ***complement and enrich*** EU-level cooperation actions for ***industrial leadership.*** Digital Single Market and common rules enable ***investments from Member States.***

Highlights: National initiatives are committed to the development of industrial digitisation policies with defined budgets that will complement the 50B€ investment from the European Commission over the next 5 years.

The DEI strategy is now permeating to national initiatives in Spain, Italy, Poland, Denmark and Germany, among the 13 National Initiatives already in place. The number of national initiatives could easily grow to 20 by the end 2017 across Member States.

Each national initiative is developing such policies with a national DNA and supporting such policies with significant investments. The need for continue collaboration, EU level coordination and best-practice sharing across national initiatives is now even more necessary to ensure that such investments are properly aligned and synergies across Member States multiply the impact of such smart investments.

A Digital Single Market (DSM) and the Data Package are fundamental elements to ensure that European strategy does not create a digital divide and that the data economy is accessible and can be capitalised across all Member States in an effective manner.

The Platform of National Initiatives to be set 23rd March in Rome will be the forum to address such needs as an open environment for all decision makers to shape the European industrial digital transformation. All stakeholders agreed that it is a time for action with the ambition to achieve a critical mass and making sure that R&D&I efforts become viable EU commercial products and services.

The panel on Highlights from national initiatives: success stories, best practices and EU-level cooperation hosted *Mario Buisán,* Director General of Industry and SMEs from the Spanish Ministry of Economy, Industry and Competitiveness, *Nigel Edmonson,* Managing Director, from MADE Denmark, *Carsten Polenz,*, Vice President Product & Innovations from SAP, representing Plattform Industrie 4.0 in Germany, *Jan Stanilko,* Deputy Director from Innovation Department, Ministry of Economic Development in Poland, *Stefano Firpo,* Director General of Industrial Policy from the Italian Ministry of Economic development, *Laurent Probst* from PwC Luxembourg and *Khalil Rouhana,* Deputy Director General, European Commission from DG Connect.

Over the last few years a number of European initiatives in Digitising European Industries have been set up. Each national imitative shares the common goals of the EU DEI strategy. Nonetheless they develop the national specificities that ensure the operational development of such strategy in the local context of the national industry. Spain launched in October 2015 their national programme. **Industria conectada 4.0**.; digitisation of manufacturing industry is at the core of the policy, which is structured in 4 main pillars:

- Awareness and education
- Collaborative environments and platforms
- Enhanced digital enablers
- Support the digital transformation of the Industry and SMEs.

The strategy has so far put in place the framework to support and enhance the adoption of Industry 4.0 by the industry / SME, integrating digital enablers. Digital self-diagnosis of Spanish industry in terms of Industry 4.0 maturity level is the first step with the introduction of the HADA tool.

The Danish government has set up the MADE programme. The programme evolves around 3 main axes: Industry, Education, Innovation, with 110 industrial partners, 5 universities and 3 RTOs. MADE SPIR (Strategic Platform for Innovation and Research) has grown from 26 projects to 44. The digital dimension has been reinforced with the MADE Digital initiative started on 1st January 2017. MADE programme has been instrumental to foster cross-regional collaboration for knowledge and risk/cost sharing with other European regions in accelerating and connecting Industry 4.0 related innovation and business development activities.

Germany, the founder of the Industry 4.0 concept has already evolved the initial programme into a highly inclusive platform taking all relevant stakeholders on-board and already developed 260 examples of industry 4.0. The programme is now focusing on transfer of industry 4.0 technologies and solutions towards SME, with the support of competence centres and the development of digital regional manufacturing innovation hubs. The Industry platform success has been built on the basis of decisions made in consensus and an open innovation platform with a focus on pre-competitive topics. Corporate leaders drive the platform activities and results are eminently tangible with priority on the development of common standards and large-scale experimentation testbeds.

Poland, as a Central European region is now engaged in the Industry 4.0 digital transformation. The transformation goal is ambitious. However, such transformation has been already successfully achieved by the banking sector. Industry is more difficult because it is dispersed and conditions for access to finance are different. Industry 4.0 programme in Poland brings forward plenty of business opportunities for small specialised integrators, which provide high value to industry 4.0 equipment and smart component leaders; e.g. Bosch, Trumpf. Local SMEs already grew over the last 20 years. However, they need now to learn how to deal with digital technology. Top down (platform) strategy should complement agile bottom up approaches (SME experimentation). The Polish administration ambition is to design an strategy, legal and business framework that will hold for the next 15 years, which is already a challenge in itself

since it will be the first time that Poland engage in the design of an strategy with such long-term vision.

Italy introduced the Piano Industria 4.0 programme, which was announced in November 2016 by the Italian government. This is a fully fledged policy intervention beyond the platform itself. The programme translates an industrial vision into a real economic policy intervention. The programme takes a technology neutral approach, establishing collaboration and open innovation models across firms. Additionally, finance stakeholders and investors contribute resources into the Italian sector. However, bank financing is not enough to leverage the Industry 4.0 vision. Capital markets need also to be incorporated. Finally, SMEs as backbone of industrial Italian production are also an integral part of the strategy and programme. The Piano Industria 4.0 will make available 11bn€ between 2017 and 2020, and 37B€ of joint public-private effort, with 2,6B€ devoted to investments in start-ups and mature companies. To address the need to build an Industry 4.0 culture 3000 managers and PhDs will be educated in industry 4.0 business organisation and associated technologies. High depreciation and super depreciation costs for industry 4.0 investments are critical incentives for the adoption of advanced manufacturing equipment and digital platforms. The strategy also foresees the development of a selected yet strong number of competence Centres as part of the Digital Innovation Hub strategy.

PwC presented the Digital Transformation Monitor Report released in the Stakeholder´s Forum. This is a policy report for industry digitisation, performed in collaboration with CARSA, ESN and iDATE. The DTM provides policy-makers with hints and priorities for potential future gaps. DTM provides insights in 7 dimensions of the national policies; i.e. Governance, Strategic focus, Technology focus, Skills focus, Funding, Standards, Internationalization. The report highlights the main challenges for Industry 4.0 policy implementation, namely moving from strategic design to concrete implementation of projects, achieving critical mass, monetising R&D outcomes in viable EU commercial applications, slow speed of implementation, upskilling and reskilling the EU workforce and internationalisation beyond the EU.

The session on highlights from national initiatives was closed with a presentation on EU-Level cooperation by Khalil Rouhana. Today there are 13 national initiatives in DEI and we should aim at 20 national initiatives by the end of 2017. Growth was incredible in the last year. Value chains are quickly developing across Europe. The EU approach is complementary to what member states do. EU should avoid templates and standardisation, because every country may need different measures. However, Europe needs to make sure that industry and national initiatives have the right rules for the DSM. It is now time to extract lessons and from experience collectively decide where to focus. EU plays a critical role in facilitating the right connections and networking across the value chain. Round tables, Working Groups and Stakeholder Forum are instruments for working together. Europe has to provide not only DEI vision but now has to work on the implementation plan. National economies have specificities that need to be respected. Dialogue will be crucial for adaptation and avoidance of misalignments. We need to ensure complementarity in our DEI approach, which is what makes the European approach different from the strategies being implemented by other regions in the world. Funding from H2020 will be critical to the implementation of the DEI strategy with 3 to 4 B€. Industry will contribute with additional 10 B€. However, 50 B€ from national initiatives are needed to ensure European leadership in DEI. To leverage such level of investment, cross-border large scale testing and experimentation is needed to generate the required evidence. Industry 4.0, connected car are clear examples of cross country and cross-border collaboration. 5G is other area where this is needed. In all this process, a two-speed digital Europe is to be avoided and everyone is welcomed to Rome in March for the launch of the Platform of National Initiatives; all decision makers are invited to establish framework to move ahead. Best practices and success stories need to be distilled in the context of national DNA and specificities so Europe nurtures the future digital industry champions.

4 – Workshop Sessions

The Stakeholder Forum hosted a series of Workshops divided in 2 Sessions of 3 parallel Workshops. These Workshops addressed the key dimensions of the DEI strategy. In particular, Workshop B1 and Workshop B2 are part of the standard DEI governance model and contributed to their regular discussions.

4.1 - Workshop A1 - Skills for the digital age – Challenges, Best Practices and Initiatives

February 1, 2017 (11:20 -12:50)
Co-chairs: Heidi Cigan (EC) and Karen Coleman

Why?

- Digital change and digitized industries need new **digital skills** and life-long learning
- **Inclusive industry 4.0**: Education of "new digital natives" and re/up-skilling the employed workers

Key results from the workshop

- Impact of digital tech on **jobs** will be strong (low-medium skilled disappear, high-skilled obsolete)
- EU cannot afford the **social cost** and the **economic impact** that goes with it
- Education system today was **designed for a different world**. It has to become more agile with involvement from all actors (academia, companies, unions).
- **Partnerships** in education are important. Digital Skills and Job Coalition is the EU initiative to help member states design coherent strategies and build partnerships.

The European Commission launched in December 2016 the **"Digital Skills and Job Coalition"** (DSJC) as the EU instrument to support Member States in the development of a coherent strategy for digital skills. The initiative builds upon the previous "Grand Coalition for Digital Skills" and already engaged 13 National Coalitions. The main objective is to drive **digital skills beyond technical and computer education** as this will be required by the digital transformation impacting on all industrial sectors.

European education system is top quality. Nonetheless, it is obsolete with respect to the needs of industrial digitalization because it was designed for different industrial needs and a different society in which jobs were much more stable. In fact, the **most demanded jobs today did not exist 20 years ago,** workforce changes jobs more regularly than ever, and the scope of the jobs also changes quite fast.

Training must become a **life-long process for everybody**. This cannot be avoided, because many jobs will be replaced or complemented by digital technologies such as autonomous systems. Moreover, artificial intelligence will challenge even high-skilled jobs and **intellect may become a commodity** in the future, in the same way in which physical strength became a commodity a long time ago. People should be encouraged to **learn how to learn**, and to take responsibility for their own reskilling. However, it will be difficult or impossible for most workers to retrain themselves without external help. The society needs to step in, with help from the State but also from employers, because we cannot bear the social cost of high unemployment. If we don't act the state will have to take care of unemployed people. This is an economic problem but primarily a problem for **dignity of human being**. Destroying jobs and replacing them with unemployment welfare is not an option.

Digital transformation will demand better training on **human-machine collaboration and interaction.** Workplace of the future will see more and more abilities and capabilities of humans and machines combined.

We need to acknowledge that **Europe has a demographic problem**: we do not have a good supply of new talents because the population is aging. We need to take special attention to the lack of young digital talents. We risk creating a **new digital divide** between the few young skilled workers and older people or low-skilled workers that will need reskilling and upskilling. We also need to be able to **reach SMEs with new technologies**; e.g. drones or augmented reality that will enable new business processes in the industrial environment. Moreover, **there is an urgent need to train the trainers** if we want to reach all SMEs all over Europe in time to capitalize on the potential economic growth of digital transformation.

Digital transformation is **not simply about technical skills**, it is also about new forms and ways of thinking related with the need for increased creativity. Not everybody should become an IT expert or a programmer, but everybody should understand what IT can do and how to use it.

Apprenticeship systems could be a key element in helping European workforce to acquire the required skills. **Partnerships are needed** between educational system (including the vocational training) and industry in order to develop the skills which are actually needed. This is already recognised by some companies which invest heavily in training, also trying to attract talents from other countries. To face the challenge of job destruction we need to look at the future and bring actors together to **design new curricula**, centred on the skills that will be needed in the future.

Autonomous systems are not yet here, but this does not mean that we should not start acting now. It will take some time until the **impact of digital education and training will be transferred to industry** through the new generation of workers and entrepreneurs. It is also necessary to incorporate a digital operation dimension into the digital transformation. Digital transformation has a dimension related to the coding and development of the new services and technologies, but this is just the tip of the iceberg. The **user-friendliness of digital technology** will be a key element for its adoption in the industrial context .

4.2 - Workshop A2 - Standards, reference architectures and testbeds for manufacturing industry

February 1, 2017 (11:20 -12:50)
Co-chairs: Reinhold Pichler (VDE) and Arian Zwegers (EC)

Why?

- Global standards are **enablers for investments**
- SMEs need **easier access to standards**
- **Testbeds** can be used to define standards

Key results from the workshop

- A **framework for common understanding** has been created (RAMI 4.0).
- A **Standardization Council** to assess proposals and push for new standards exists in Germany.
- **A network of test labs** was established in Germany to enable experimentation and validation of new technologies and inspire new standards.
- Don't re-invent the wheel; **involve market players**.
- Aligned with **priorities of EU for standards** in Cloud, IoT, 5G , Security, Data.

To achieve a truly **integrated Digitized European Industry**, the implementation and development of **standards** that are based on the broad, international consensus of companies, users, governments and other stakeholders, such as unions, are vital. Standardization contributes to compatibility, interoperability, quality and safety of products and processes. It also leverages **commoditization of processes** that were formerly custom and proprietary. During this workshop, five experts presented their perspective on the role of standards for the Digital European Industry initiative:

- Thomas Hahn, Siemens and Chair of the Labs Network Industrie 4.0 (LNI4.0)
- Reinhold Pichler, VDE and Chair Standardization Council Industrie 4.0
- Karsten Schweichart, Deutsche Telekom and Chair AG1 "Standardization & Reference Architecture", Platform Industrie 4.0
- Franco Cavadini, Synesis
- Antonio Conte, DG Internal Market, Industry, Entrepreneurship and SMEs, EC

Their presentations were followed by questions and feedback from the audience, of approximately 90 people.

Effective standards require an environment of **experimentation and consensus building**. Especially SMEs do not automatically have access to such an environment, e.g. because they lack the equipment or because they lack the network of contacts. However, **SMEs are a very important source of innovation** and it is critical that they become **actively involved** in a comprehensive standardization process.

The first presentation provided an example of how this could be addressed, by introducing the **Labs Network Industrie 4.0.** This network, which was founded in the context of the broader Industrie 4.0 initiative in Germany, particularly has in mind to **unleash the technological potential** that resides with the **"hidden champions"** among the SMEs. LNI 4.0 consists of a network of 26 test facilities around the country. In LNI 4.0 large companies such as Siemens, T-Mobile, Hewlett Packard and SAP work **together with sector organizations** such as the German Mechanical Engineering Industry Association (VDMA), the Federal Association for Information Technology, Telecommunications and New Media (Bitkom), the German Electrical and Electronic Manufacturers' Association (ZVEI), **government and universities** to provide

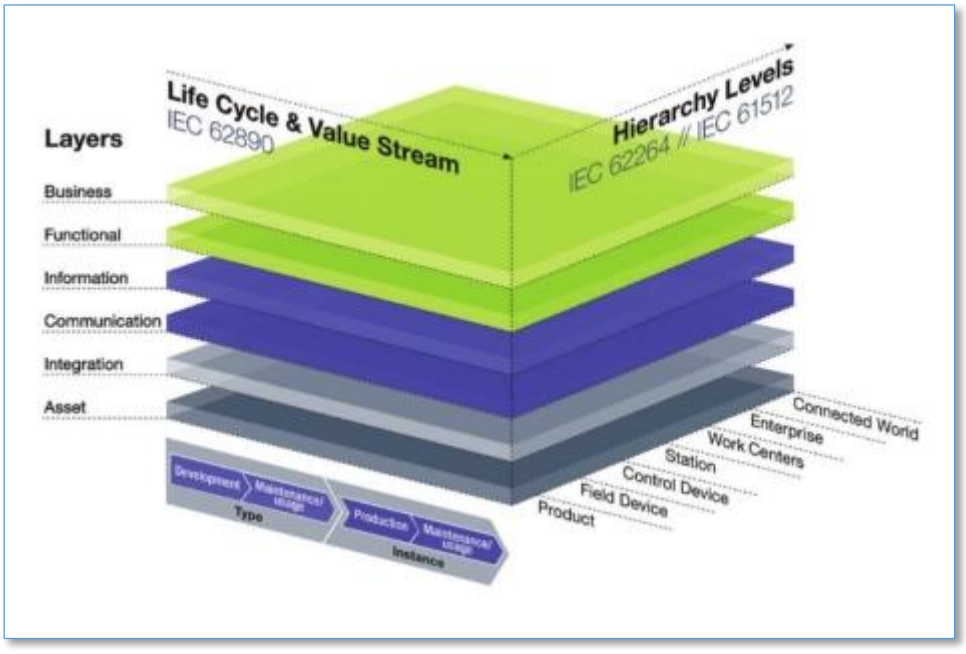
SMEs with easy access to equipment and partners. This allows them to develop comprehensive test scenarios for new technology that can inspire new standards.

The potential for new standards that is created by an environment such as LNI 4.0 **needs to be complemented** by an authoritative entity that decides which proposals will actually be established as standards.
The second presentation dealt with this aspect of the standardization process by providing details of the **Standardization Council Industrie 4.0.** This was launched during the Hannover Messe in April 2016 as **a joint cross-sectoral initiative** of VDMA, Bitkom, ZVEI, the German Institute for Standardization (DIN) and the German Commission for Electrical, Electronic & Information Technologies of DIN and VDE (DKE). It works closely together with the LNI 4.0 and supports practical tries in test centres. This comprehensive approach is currently **quite unique in the world.** The Standardization Council will accept proposals for standards resulting from these tests and will guide them towards further standardization at national and international level.

The decisions and activities of entities such as the Standardization Council Industrie 4.0 need to be **based on a shared understanding** of the standards landscape. This common understanding is necessary to see how newly proposed standards relate to existing ones and where further work remains necessary.
The third presentation focused on this aspect of standardization, by presenting the **Reference Architectural Model for Industry 4.0 (RAMI).** This model is described in detail in DIN specification 91345 and is attracting significant attention internationally. The specification contains a conceptual part (for the classification of underlying ideas) and a data technological part (specifying the integration of components into "Industrie 4.0"). DIN 91345 is under discussion by international standardisation organisations such as ISO and IEC. RAMI 4.0 is a three dimensional map that can be used to classify standards according to three dimensions:

1. The position in the **factory hierarchy** (from individual products, to the enterprise as a whole)
2. The position in the **business life cycle** (from development to usage)
3. The position in the **architectural layer** (from physical things to business processes)

Each object needs an administration shell to integrate it into Industrie 4.0. See the Figure below for an illustration of the structure of RAMI 4.0.



While new technology can inspire new standards, as described above, the fourth presentation emphasized that **existing** standards can also inspire new technologies. Stated differently, standardization can help prevent that one ends up **re-inventing the wheel**.
The presentation focused on the **EU-funded Daedalus initiative**, which started in October 2016. It will build on the IEC 16499 standard (from 2005) to develop a completely distributed automation platform, that allows complex and optimized behaviour on the shop floor while still allowing individual and direct accessibility of a Cyber-Physical System (CPS). Examples such as these further illustrate how standardization can make a dynamic contribution to the development of manufacturing in Europe.

The importance of standardization was emphasized in the EC's **Communication on ICT standardization priorities for the Digital Single Market** (COM (2016) 176), that was presented as part of the package on the DSM on April 19, 2016. The content of this Communication was described in the final presentation.
Key principles for the EC are that **standardization will remain industry-led and voluntary**, is based on **cross-sector partnerships** and is based on **validation through R&D experiments**. Obviously, the previous presentations provided excellent examples of this. Furthermore, priority areas for standardization identified by the EC are: **Cloud Computing, Internet of Things, 5G communication networks, Cybersecurity and Data**. Priority domains to benefit from standards include **Manufacturing, besides eHealth, Smart Cities, Autonomous Vehicles** and others.

In the subsequent round of questions from the audience, presenters were able to provide more details about European and international aspects of their initiatives, in particular concerning the international dimension of efforts related to Industry 4.0. They also provided more details about the **social aspects of standardization**, in particular about what is required to make sure that the distribution of benefits deriving from standards remains fair.

4.3 - Workshop A3 - Security and data security for industry

February 1, 2017 (11:20 -12:50)
Co-chairs: Bjoern Juretzki (EC) and Klaus-Dieter Wolfenstetter

Why?

- **No digitisation without security**.
- **Data is an asset** and has to be protected and trusted data exchange ensured.
- Cybersecurity in **industry 4.0 context.**

Key results from the workshop

- **Cybersecurity hits RAMI 4.0 at all levels** and key to multi-homed industrial data platforms operation.
- Cybersecurity in industry 4.0 for SMEs should start from **solid (digital) asset inventory** development.
- The factories need to be protected as **part of business strategy** (KPIs & new Chief Industrial Security Officer (CISO) role at factory Operational Technologies (OT) level).
- **Secure identity management** the basis for secure value chains.
- **Product certification** could help to comply with Network & Information Security (NIS) directive & raise confidence in the development.

Digitisation of European Industry **demands new levels of security**. Machine and systems are new targets. The security technology changes fast, as fast as the attacker's patters do. This situation is new to shop floor operations, which traditionally has been "disconnected" from the Internet world and the associated security threats. Cybersecurity should therefore involve **not only manufactures but users, industry and governments**; it is a collective effort.

Cybersecurity and trust are prerequisites for reliable intercompany communications. Cybersecurity is a **mainstream policy**, not a black box anymore. ICT cybersecurity is not just a technology but should be a focus for digital skill development. DSM success is intimately linked to **addressing comprehensively the challenges of cybersecurity**.

Digital transformation does not mean simply businesses moving on-line. Europe should make sure that that digital (r)evolution is not being disrupted by the cyber security since the number of incidents and their impact are rising at an alarming pace. Critical sectors without appropriate measures in place could **undermine the impact of digital transformation** in quality job creation and economic growth generation.

It is important to improve over the EU **cybersecurity strategy**, dating 2013, from the point of view of values, international cooperation, protection of internal market and fight of cybercrime. In 2016, Europe has witnessed first comprehensive EU legislation on **Networks and Information systems Security** (NIS), the **cPPP on cybersecurity** being launched and the need for certification becoming a real need. A public consultation on the **ENISA mandate** has started on January 2017. It has been structured putting forward the questions about the main threats and cybersecurity actions an EU level strategy should have.

A European **ICT cybersecurity certification framework**, covering product and service certification, is needed for the development of a single DSM. Different product certification and lack of transparency could hamper business opportunities across the borders. In this context, industry demands for **simpler procedures in the product and service conformance** and an approach that would allow a *"**certify once, market everywhere**"*. Certification will raise the confidence and reliability in the digital product and service but we need to acknowledge that **security certification is just a static picture of the system**.

Security of networked systems in the context of industry 4.0 should **focus on SMEs** and pay special attention to their needs. Key topics should deal with **secure communications** in digital transactions, which are essential in dynamic value creation across companies. **Trustworthiness** is also a key challenge from the perspective of making available a method and a model for an automated security level assessment of a value network. Moreover, **secure identities** for protection and for ensuring transactions or data being added to the value network are key elements in verification of data integrity. Additionally, **legally binding contract resolution** and conclusions with machine involved in the dynamic/ad-hoc value network is also a key challenge in digital transformation of connected factories and digital ecosystem evolution.

Secure identities are the building blocks and the starting point in an industrial secure network. Secure identities are the foundation of the security chain. Digitised industries will generate more data traffic within and across companies, so we need to pay **special attention to multi-domain operations,** which need to be done in the right way. Security should be an **integral part of industry 4.0** and as such should consider **all dimensions of RAMI 4.0** reference architecture from the value stream to hierarchical levels and layers.

IT security is only one part of the story. How to handle this in the **process and organization** is as equal if not more important dimension of the digital transformation. Human skilling and security culture are therefore also crucial. The development and deployment of a security management system is essential for industry 4.0 operation. The IT security officer should evolve into an Industrial security officer dealing with Operational Technologies (OT) security on the shop floor.

The identification of assets is central to understand the right cybersecurity strategy. The **assets and the associated value** are key elements to define how to handle security in the organisation. A differentiating aspect of industry 4.0 is that **blue collar workers**, which are usually not involved in the security activities, will have **competences in areas impacting on the cybersecurity** strategy. Technically the elements are there but a global framework is yet needed to manage digital identifies. So, a common demonstrator on how to show global security collaboration is very much needed.

In the context of the digital industry, industry should acknowledge that **security is now a moving target** and that the organisation and the workforce need to adapt to this moving target. Hence, dynamic and adaptive strategies for asset management should be considered and implemented. In fact, 85% of the attacks experienced by industry are organised by groups (hacktivists, competitors, cybercriminals, government) with specific agendas. This landscape dictates the mitigation actions to be put in place in the context of the digital industry. Security should therefore **address the needs of products**, ICT, SCADA/ICS and physical premises

Cybersecurity objectives should **coexist with productivity KPIs**, which is not a trivial task. Production is not necessarily interested in machines being stopped, connected or not used. However, a large company such as Airbus producing 60-70 aircrafts a month with an average price of 100 to 150 M€ has an average 100 billion euro throughput in cash flow going out of the factories. The margin on sales is below 1%. An attack on the **connected factory** or connected supply chain would have a **much more profound business impact** than hacking a product itself.

Consequently, the **factories need to be protected** as part of business strategy. However, cyber insurance is yet an **emerging niche market** that needs to mature, grow and consolidate to support the operation of digital factories. Well documented events can generate an estimation of the risk, but the current coverage of digital operations is not yet sufficiently documented.

4.4 - Workshop B1 - Digital Innovation Hubs: Mainstreaming digital innovation across all sectors

February 1, 2017 (13:50 -15:30)
Co-chairs: Werner Kohnert (DLR & Digitale Anwendungen - Mittelstand-Digital) and Anne-Marie Sassen (EC)

Why?

- **Innovation Hubs** to make digital technology **available for any SMEs** within "working distance"
- **Best practices exchange** for a strong and complementary European network of DIH.
- **Stocktaking of results** after the first meetings of WG

Key results from the workshop

- A DIH is a **one-stop shop** providing **services to companies in the region** through a **multi-partner cooperation**
- Variable approaches foreseen: sector-focused; technology-focused; application-focused, etc…
- A successful DIH should offer **single point of entry** and provide **support** rather than funding
- Examples show importance of **staged services**, offering companies a clear path towards digitisation
- DIHs grow organically **based on regional strengths**: should be Hubs are SME facing & address industry needs
- **Regions** will be key to implementation – need **regional strategies** and joined up funding regional/national/EU
- Key outputs so far: **Catalogue of DIHs being compiled**; H2020 to reinforce networking and cross-border activities

The full report of the discussion of Working Group 1 is available in Futurium web site – please consult https://ec.europa.eu/futurium/en/dei-implementation

4.5 - Workshop B2 - Strengthening leadership in digital technologies and in digital industrial platforms across value chains in all sectors of the economy

February 1, 2017 (13:50 -15:30)
Co-chairs: Max Lemke (EC) and Thomas Hahn (Siemens)

Why?

- **Stocktaking of results** after the first meetings of WG
- Articulation and **coordination of digital platforms** across EU member states and industry
- Transition towards **large-scale federating initiatives** to reach the critical mass needed for digital industrial platforms

Key results from the workshop

- **Many initiatives in verticals**, e.g. Agri-food, Health and Manufacturing
- Extra **leverage by horizontal technologies**, e.g. Data platforms and IoT
- Much **fragmentation**; need for orchestration
- DEI to stimulate bottom-up **experimentation, federation and standardization**
- **Joint effort** of EU, national and regional initiatives necessary
- Provide **feedback to draft report** of WG 2 (see Futurium)

The full report of the discussion of Working Group 2 is available in Futurium web site – please consult https://ec.europa.eu/futurium/en/dei-implementation

4.6 - Workshop B3 - Regulatory challenges for digitizing industry

February 1, 2017 (13:50 -15:30)
*Co-chairs: **Bjorn Jureski (EC)** and Alexander Duisberg (Bird&Bird)*

Why?

- **Free flow of data** and **data economy** at the core of digitization
- **Regulation a key issue** of industry 4.0 and autonomous systems in general
- **Legal framework needed** for product liability e.g. autonomous systems.

Key results from the workshop

- EU and national **regulations should not conflict.** Public Consultation on "Building European Data Economy" package is open to collect feedback on the subject.
- Technical control of **EU Trade Secrets directive** is difficult and may conflict with free flow of data.
- "**Freedom of contract**" is a key element for innovative business models and could be used to resolve data ownership assignment for machine data.
- **Liability Defective Product (LDP) directive** is being evaluated to assess, among others, allocation of liability for digital *servitised* products based on IoT systems, embedded products & autonomous systems

Data economy is one of the DSM pillars. Digital (r)evolution and transformation is actually built on data. Data economy provides a sizeable gain of 3.17% GDP. The **Data Package** is a key policy instrument articulating the measures for that to happen.

Data protection rules are the foundation of the EU data economy. The objective is that, as of May 2018, **one single pan-European set of rules** for the protection of personal data is in place. The Data Package deals also with anonymized and non-personal data going beyond personal data. Data should be able to **flow freely across borders** and within a single data space. We need a coordinated and pan-European approach to make the most of data opportunities, building on **strong EU rules to protect personal data and privacy**.

This implies the implementation of 4 chapters:

1. **Free flow of data.** Often data is stacked in a member state due to legal or administrative measures. 50 restrictions are currently known in this respect. Need for **data localization** and digital "border controls" inhibit business, in particular for SMEs.
2. **Data access and transfer.** Machines now generate huge amounts of non-personal data. Access to large and diverse datasets is an **untapped source to build business**. The limited access is creating **data silos**. Manufacturers currently are the de facto "owners" of machine generated data.
3. **Data portability, interoperability and standards**. Portability of non-personal data could foster **innovation and new services**, and stimulate competition but should be made easier and less costly.
4. **Liability in the context of IoT and autonomous systems**. Internet of Things (IoT) and autonomous systems combine hardware, software & data from many market players, making it difficult to identify who is responsible for a specific dataset.

A wide dialogue with **Member States and stakeholders, including public consultation** is open until April 2107.

Digital transformation entails **increased connectivity** of systems and objects. Data do have an economic value in our society. However, to leverage such value ***"freedom of contract"*** is perceived as key to innovation at business model level; such freedom of contract should be aligned with EU legislation.

Protection of know how in Industry 4.0 is increasingly important. EU Trade Secrets (TS) directive is good but the technical control of TS is difficult. Moreover, beyond IPR, new legislation should **protect machine-generated data** and assignment of data should abide to the freedom of contract principles.

Liability for Defective Product (LDP) directive is being evaluated to assess, among others, allocation of liability for digital servitised products based on IoT systems, embedded products & autonomous systems.

Autonomous systems pose clear challenges in terms of **liability**. **Risk management** is a useful instrument and approach to substitute traditional liability assessment. Increasing automation & autonomy will shift liability **from user to producer** gradually, creating uncertainty and litigation. Risk management implies that **liability holds on the stakeholder in best position to insure against the risk** allowing ex-ante analysis. Contracts agreements **distribute liability across the value chain**, and therefore leverage more efficient management of risks.

5 – Conclusions

The First Stakeholder Forum was a successful event, which raised significant interest and hosted concrete and factual discussions. A notable result is the broad agreement on the need for **continuous cooperation at EU level.**

In this context, a **European Platform of National Initiatives** will be launched in Rome on March 23rd. The platform will provide an efficient tool to exchange best practices between national and EU-level digitalisation strategies and facilitate the pooling of resources and co-investments. The launch event will also be the opportunity for Ministers to reinforce the support for a timely, ambitious and efficient implementation of the digital transformation of industry.

The **Stakeholder Forum** and **the European Platform of National Initiatives** are two components of the governance of the "Digitising European Industry" initiative. Other components are the periodic **round-tables** with high-level representatives from national initiatives, Ministries and European associations, and the two **Working Groups**, which meet regularly to work out the roll-out of Digital Innovation Hubs across the EU (WG1) and to outline the common actions towards Digital Industrial Platforms initiatives (WG2).

The next Stakeholder Forum is planned for 2018. By that time, we expect that the **number of active National initiatives** for the digitisation of industry will grow **from the current number of 13 to 20**, with fifty new digital innovation hubs active across Europe. This will mean about **two hundred digital innovation hubs in total**, a significant step towards the objective of granting access to digital technology **for every business** within working distance anywhere in Europe.

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Annex I: Agenda

Programme Day 1 – January 31st

10.00	**Site visits** Visits to examples of digital innovation/companies
11.00	**Accreditation opens**
13:00	**Sandwich Lunch, exhibition will be open**
14:00	**Welcome and Keynote (K1)** ▸ **European cooperation to accelerate the digitisation of industry** Speaker: Dr. **Wolfgang Sheremet**, Director General Industrial Policy, German Federal Ministry for Economic Affairs and Energy ▸ **Digitising European Industry: the view of the Maltese Presidency** Speaker: Dr. **Christian Cardona**, Minister for the Economy, Investment and Small Business, Malta ▸ **Digitising European Industry: State of the Initiative** Speaker: **Khalil Rouhana**, Deputy Director-General, European Commission, DG Connect
14:45	**Panel (P1)** **Mastering the Digitisation of Industry in Europe – How to Allow SMEs and Large Enterprises to Compete on a Global Scale** ▸ **Laurent Blanchard**, Executive Vice President, Dassault Systèmes ▸ **Ineke Dezentjé Hamming-Bluemink**, President, Employers association FME ▸ **Tomas Hedenborg**, President, Orgalime ▸ **Peter Olson**, VP & Head of European Affairs, Ericsson
15:45	Coffee break
16:15	**Panel (P2)Societal challenges in the digitisation of industry – opportunities and challenges** ▸ **Christian Decker**, CEO, DESMA Schuhmaschinen GmbH ▸ **Prof. Dr.-Ing. Reiner Anderl**, TU Darmstadt ▸ **Luigi Perissich**, Director General, Confindustria Innovative and Technological Services ▸ **Piet Mosterd**, Field Lab
17:45	**Presentations** **Future visions on digital Industries** ▸ **Kerstin Eichmann**, Head of Machine Economy Innovation Lighthouse Innogy – Machine Learning for sustainable energy ▸ **Thomas Zeller,** CDO UnternehmerTUM GbmH and **Dirk Mühlenweg**, Head of Sales Global Watson IoT Center – Munich digital eco systems - best practices and outlook ▸ **Sebastian Raßmann**, Senior Innovation Advisor, TrendOne – The World in 2025 – Digital Transformation of Industry
18:45	**End of the conference**
19:00	**Networking Dinner**

Programme Day 2 – February 1st

07.30 **Accreditation opens**

08.15 **Walking breakfast within the exhibition space**

08:45 **Keynote (K2)**

- **State of Digitization in Europe**
  Stefan Schaible, Deputy CEO, Roland Berger

09:05 **Panel (P3)**
Highlights from national initiatives: success stories, best practices and EU-level cooperation

- **Mario Buisán,** Director General of Industry and SMEs, Spanish Ministry of Economy, Industry and Competitiveness
- **Nigel Edmonson**, Managing Director, MADE Denmark
- **Carsten Polenz**, Vice President Product & Innovations, SAP, representing Plattform Industrie 4.0 (Germany)
- **Jan Stanilko,** Deputy Director, Innovation Department, Ministry of Economic Development,
- **Stefano Firpo**, Director general of industrial policy, Italian Ministry of Economic development
- **Laurent Probst**, PwC Luxembourg
- **Khalil Rouhana**, Deputy Director General, DG Connect

10:20 **Coffee break**

Meet a national initiative:

"speed dating" service to allow any interested participant to discuss with representatives of the national initiatives.

EC initiatives presentation:

The EC booth will showcase the DTM (Digital Transformation Monitor) Scoreboard and the WATIFY campaign

11:20 **Parallel Workshops Session 1**

Workshop A1 //
Skills for the digital age – Challenges, Best Practices and Initiatives

How to share actions at national and European level? Which new education and life-long learning schemes can cope with the digital change?

How to enhance cooperation in the research sector and training programmes within companies?

What role for the Digital Skills and Jobs Coalition?

Workshop A2 //
Standards, reference architectures and testbeds for manufacturing industry

What are the possibilities and opportunities of using testbeds and other bottom-up approaches to define standards?

How to enable and foster dialogue and collaboration between testbed-Institutions in the different member states?

How to make access to standards easier for SMEs?

Workshop A3 //
Security and data Security for industry

What are the prerequisites for a secure and trustworthy treatment of data and a reliable protection of inter-company communication?

What can companies do today to ensure security?

How to share actions at national and European level?

What are the priorities for European cooperation?

12:50 **Walking lunch within the exhibition space**

13:50 **Parallel Workshops Session 2**

Workshop B1 //
EU Working Group 1 session: Digital Innovation Hubs - Mainstreaming digital innovation across all sectors

The workshop will present the results achieved in the different sub-working groups of the Working Group 1 of the DEI initiative; it will also discuss issues and actions needed, with a focus on:
- An exchange of best practices between already existing digital innovation hubs/competence centers;
- Examples of what regions/member states can do to strengthen local presence of digital innovation hubs;
- Measures that the EU will be taking to support a network of digital innovation hubs.

Workshop B2 //
EU Working Group 2 session: Strengthening leadership in digital technologies and in digital industrial platforms

The workshop will present the results achieved in the different sub-working groups of the Working Group 2 of DEI initiative; it will also discuss issues and actions needed, with a focus on:
- Stocktaking of results after the first two meetings of WG2;
- Alignment and better articulation of national programs, coordination between different PPPs and focused investment by the EU, Member States and industry;
- Transition towards large-scale federating initiatives to reach the critical mass that is needed to realise value of digital industrial platforms.

Workshop B3 //
Regulatory challenges for digitizing industry

The workshop will deal with the key regulatory issues for digitisation of industry, namely
- creating a data economy,
- securing the free flow of data and
- safeguarding product liability.

It will address the general question: how can intelligent and autonomous systems be regulated in the future?

15:30 **Coffee break**

16:15 **Final Keynote**

- **Günther H. Oettinger**, EU Commissioner in charge of Budget and Human Resources

16.45 **Plenary Session**

- **Reports from the working groups**

17:15 **Conclusion**

- **Karen Coleman,** Journalist, author and founder of EuroParlRadio

17:30 **End of the conference**

* Interpretation will be provided in German / English / French for the plenary sessions
* Events in **RED** in the text will take place in the exhibition space on the ground floor. All other events will take place in the big conference room on the first floor.

Twitter:
#DEIforum #DigitiseEU #industrie40
https://twitter.com/hashtag/DEIforum
https://twitter.com/hashtag/DigitiseEU

Workshop A1

Skills for the digital age – Challenges, Best Practices and Initiatives

1 February 11:20 – 12:50

The workshop will focus on:

- Which new education and life-long learning schemes can cope with the digital change?
- How to enhance initiatives and cooperation in the research sector and training programmes within companies?
- How can we share actions at national and European level? What role for national governments and the European Digital Skills and Jobs Coalition?

Agenda

11:20 Welcome and introduction: Karen Coleman, Journalist, author and founder of EuroParlRadio

11:05 **Part 1: Setting the scene**

Presentation of the Digital Skills and Jobs Coalition, Heidi Cigan, Head of Sector, Digital Economy and Skills, DG CONNECT, European Commission

Keynote speech on "Continuous learning for continuous change", Jorge Schnura, COO & Co-Founder, source{d}

11:30 **Part 2: Panel discussion on "Reskilling the workforce: overcoming the digital talent challenge"**

Participants will discuss challenges and best practices for “Reskilling” the workforce in companies. They will touch on challenges and best practices concerning educational training as well as new scientific initiatives on training the workforce, and last but not least discuss possible recommendations for policy-making at national and European level:

- Jorge Schnura, COO & Co-Founder, source{d}

- Martin Sauer, Senior Expert Working Conditions / Labour Relations 4.0, Robert Bosch GmbH.

- Oliver Röthig, Regional Secretary, Uni Europa

- Mirko Wesling, Head of Unit, Department of Vocational Education and Training, German Confederation of Skilled Crafts (ZDH)

- Davide Meinero, Member of the Coordination Group for ERA 4.0 Pilot (E.R.-AMIAT-Torino Wireless), Managing Director at I&D Consulting, Lecturer of Sociology of Economic and Labor Processes at the School of Management of Turin

- Thilo Zimmermann, Project Manager Future Work Lab, Fraunhofer Institute for Manufacturing Engineering and Automation

12:20 Question and Answer

12:50 End of the session

Workshop A2

Standards, reference architectures and testbeds for manufacturing industry

1 February 11:20 – 12:50

The workshop will focus on:

- What are the possibilities and opportunities of using testbeds and other bottom-up approaches to define standards?
- How to enable and foster dialogue and collaboration between testbed-Institutions in the different member states?
- How to make access to standards easier for SMEs?

Agenda

11:20 Welcome and introduction (Reinhold Pichler - VDE and Arian Zwegers - EC)

Speakers:

- Thomas Hahn, Siemens: Labs Network Industrie 4.0

- Reinhold Pichler, SC I40: The work on Standardisation Council Industrie 4.0

- Karsten Schweichhart, Deutsche Telekom: Reference Architecture Model RAMI 4.0

- Franco Cavadini, Synesis: Interoperability, modularity and scalability: IEC-61499, a standardized platform to unify European digital automation

- Antonio Conte, European Commission DG Grow: ICT Standardisation Priorities for the Digital Single Market

12:10 Panel discussion

12:30 Questions from the audience

12:50 End of the session

Workshop A3

Security and data security for industry

1 February 11:20 – 12:50

The workshop will focus on:

- Understanding of cybersecurity in Industry 4.0 context
- Prerequisites for a secure and trustworthy treatment of data and a reliable protection of inter-company communication (secure identities, secure communications)
- How to share actions at national and European level
- Priorities for European cooperation

Agenda

11:20 Welcome and introduction (Klaus-Dieter Wolfenstetter)

Speakers:

- Jakub Boratynski, European Commission, Head of unit Cybersecurity and Digital Privacy, DG CONNECT

- Michael Jochem – Director Projekt Industrie 4.0@Bosch

- Axel Krein – Senior VP at Airbus, Cybersecurity PPP

- Hubert Tardieu - advisor of CEO, Atos SE

- Guillaume Adam – head of services at FIEEC, responsible for regulatory affairs

- Panel discussion

- Questions from the audience

12:50 End of the session

Workshop B1

Digital Innovation Hubs: Mainstreaming digital innovation across all sectors

1 February

The workshop will present the results achieved in Working Group 1 of the DEI initiative; it will also discuss issues and actions needed, with a focus on:

- An exchange of best practices between already existing digital innovation hubs/competence centers;
- Examples of what regions/member states can do to strengthen local presence of digital innovation hubs;
- Measures that the EU will be taking to support a network of digital innovation hubs.

The session will be moderated by Werner Kohnert, Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)
Digitale Anwendungen - Mittelstand-Digital

Agenda

13:50 Introduction to Digital Innovation Hubs: Anne-Marie Sassen, Deputy Head of unit "Technologies and systems for digitising industry", DG CNECT

14:00 Part 1: Exchange of best practices on digital innovation hubs

Mittelstand 4.0-Kompetenzzentrum Dortmund: an SME Enabling Center for Digital Transformation – Services, Experiences and Actual Needs of German Mittelstand", Maria Beck, Managing Director, Mittelstand 4.0-Kompetenzzentrum Dortmund, Part of BMWI-Initiative Mittelstand-Digital

Digital Hub Dortmund as Cluster Upgrade – New Formats for Innovative Collaboration of Industry and Science to foster Faster Digital Transformation and Market Success", Thorsten Hülsmann, CEO, EffizienzCluster Management GmbH

Experience from ACTPHAST with supporting photonics innovation in European companies: lessons learned and impact achieved, Hugo Thienpont, Vrije Universiteit Brussels

14:20 Discussion

14:40 Part 2: What can be done at Member State/Regional level and what at EU level

JIC Innovation Park: A catalyst for innovation and growth in South Moravia: Adéla Hradilová, JIC, Czech Republic

Setting up a Digital Innovation Hub in Poland: Experience with the mentoring programme of I4MS: Sanyu Karani, CEO FundingBox, Poland

The foreseen Catalogue on Digital Innovation Hubs: Maurits Butter, TNO, NL

Initial ideas on EU level actions in the next Horizon 2020 workprogramme to reinforce networking of Digital Innovation Hubs: Ronan Burgess, DG CONNECT

15:10 Discussion

15:30 End of the session

Workshop B2

Strengthening leadership in digital technologies and in digital industrial platforms across value chains in all sectors of the economy

1 February

The workshop will present the results achieved in the different sub-working groups of the Working Group 2 of DEI initiative; it will also discuss issues and actions needed, with a focus on:

- Stocktaking of results after the first two meetings of WG2;
- Alignment and better articulation of national programs, coordination between different PPPs and focused investment by the EU, Member States and industry;
- Transition towards large-scale federating initiatives to reach the critical mass that is needed to realise value of digital industrial platforms.

The session will be moderated by Max Lemke, European Commission and Thomas Hahn, Siemens, Labs Network Industrie 4.0

Agenda

13:50 Welcome and introduction by Max Lemke, Head of Unit Technologies and Systems for Digitising Industry, DG CNECT

Part 1: Key markets / industrial domains – vertical perspective

14:00 "Connected Smart Factories: Industry-driven platforms to master the value chains in manufacturing", Maurizio Gattiglio, Executive Vice President Prima Electro S.p.A., Chairman of European Factories of the Future Research Association (EFFRA)

14:10 "Smart Agriculture: Sustainability and efficiency to be gained through integrated solutions supported by appropriate digital platforms", Luis PEREZ-FREIRE, Executive Director GRADIANT & Chair of the Smart Agri working group of the IoT Alliance.

14:20 "Digital Transformation of Health and Care: new opportunities to address demographic and economic challenges", Dr. Jan Van den Biesen, Vice President Public R&D Programmes of Philips Research

Part 2: Cross-cutting horizontal technologies - Industrial Data Platforms and Internet of Things

14:30 "IDPs: Crucial for the digitisation of industrial production and for further use of data", Boris Otto, Fraunhofer ISST, Big Data Value PPP

14:40 "Internet of Things: cross-cutting integration platforms across sectors", Dr. Ovidiu Vermesan, Chief Scientist, SINTEF ICT

14:50 Discussion

15:30 End of the session

Workshop B3

Regulatory challenges for digitizing industry

1 February

The workshop will deal with the key regulatory issues for digitisation of industry, namely creating a data economy, securing the free flow of data and safeguarding product liability. It will address the general question: how can intelligent and autonomous systems be regulated in the future?

Agenda

14:00 Welcome and introduction: Dr. Alexander Duisberg (law firm Bird&Bird)

Speakers:

- Andrea Bertolini – Scuola Superiore Sant'Anna
- Maria Spiliopoulou – European Commission, Deputy Head of Unit B4 DG GROW
- Bernhard Fischer – Chief IP Attorney and Vice-President at SAP
- Celina Ramjoué – European Commission, Deputy Head of Unit G1 DG CONNECT

- Panel discussion
- Questions from the audience

15:30 End of the session

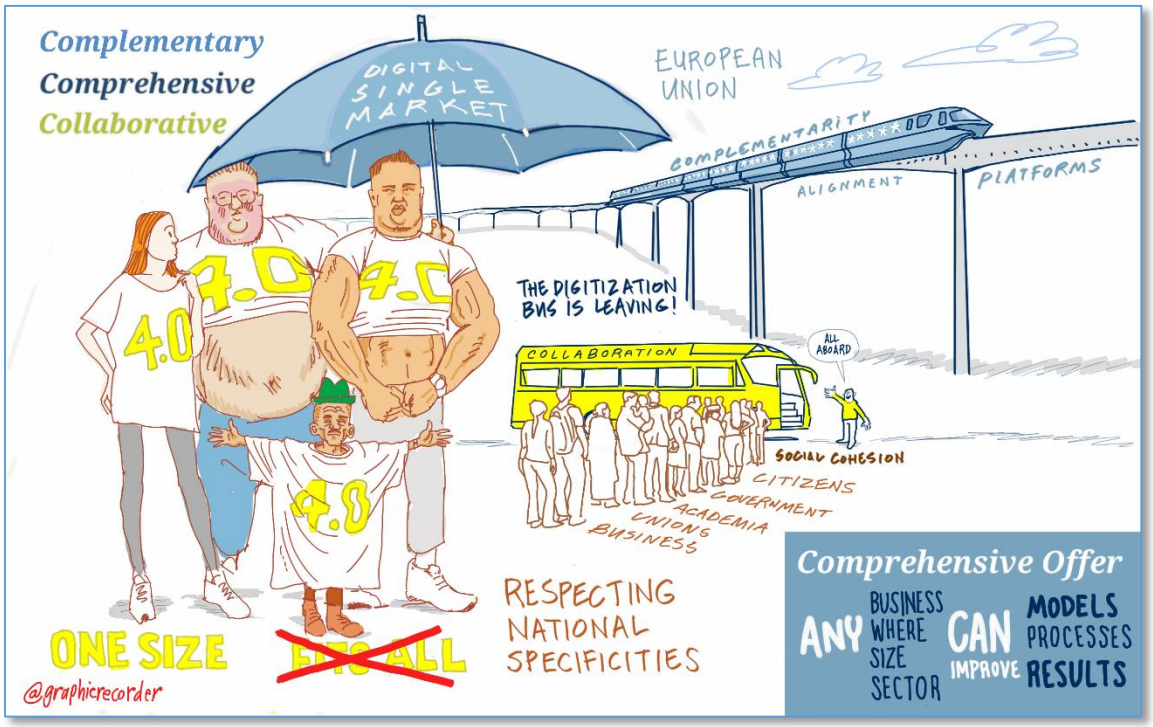
Meet a national initiative

The speed dating session “meet a national initiative” shall provide the opportunity to the participants of the conference to get to know other European countries’ efforts and products in the context of digitising industries.
During the coffee break, national initiatives will present their work either at one of the booths in the exhibition area or at “country tables” which will be set up in the event location. These tables will be marked by the respective national flag and provide the opportunity to showcase publications and personally engage with other participating countries to foster an exchange of ideas and results during the speed dating session.

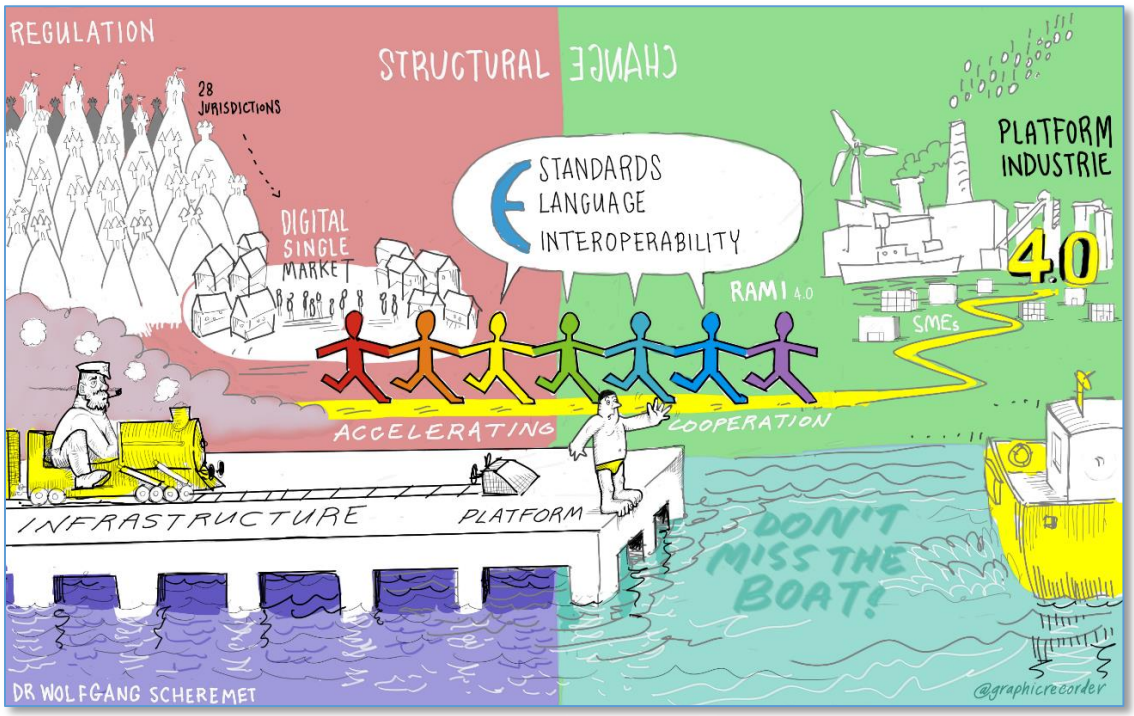
Having one hour to engage with each other the national initiatives can hold short presentations, distribute leaflets and publications or just talk to interested persons. The use of additional country tables ensures that every nation that wants to present their status on digitising industries is also given the chance to represent themselves without making the effort of staffing a complete booth.

Every 10 minutes a sound signal will remind to participants to move on to the next national initiative to ensure a broad exchange.

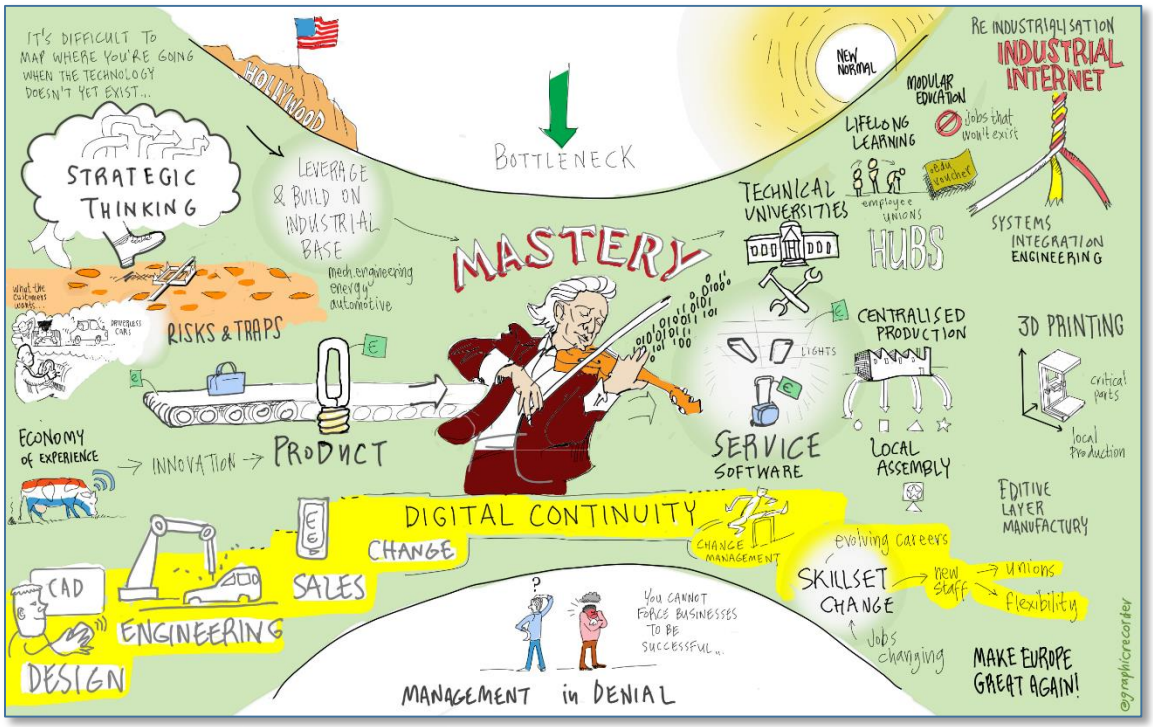
Annex II: Visuals



Key results: European DEI strategy ***complementary*** to Members States and Regions with a ***comprehensive*** package of policies respecting differences across Member States and fostering ***collaboration*** and dialogue for all stakeholders

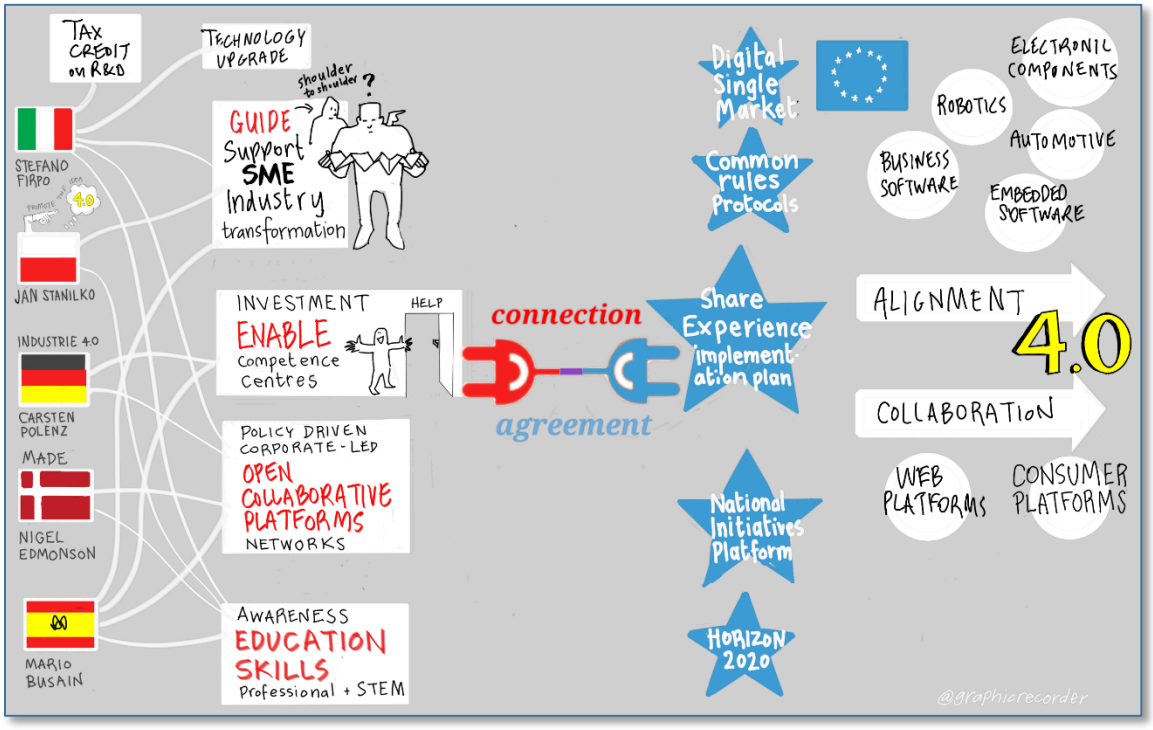


Digital Structural Change: Coherent set of action lines towards a ***Digital Single Market*** (DSM) leveraging on ***global standards***, interoperability, European digital regulation and ***digital infrastructures and platforms*** to drive Industrial Digital Transformation from large industry to ***SMEs***



Mastering Digital Continuity in Europe: European industrial leadership through ***lifelong learning*** and ***trusted free flow of data*** across product and process lifecycle. Targets: digital business innovation, manufacturing servitization, new production capabilities in Europe and ***multisided digital platforms*** ecosystems.

Societal challenges: SME readiness for new ***digital business practices***, societal adoption of autonomous systems and data and knowledge governance in ***data-intensive*** digital industrial ecosystems for new ***mass-customisation*** production.



National initiatives: National priorities in industrial digitisation ***complement and enrich*** EU-level cooperation actions for ***industrial leadership.*** Digital Single Market and common rules enable ***investments from Member States.***

Graphics: https://visuologyblog.wordpress.com/