



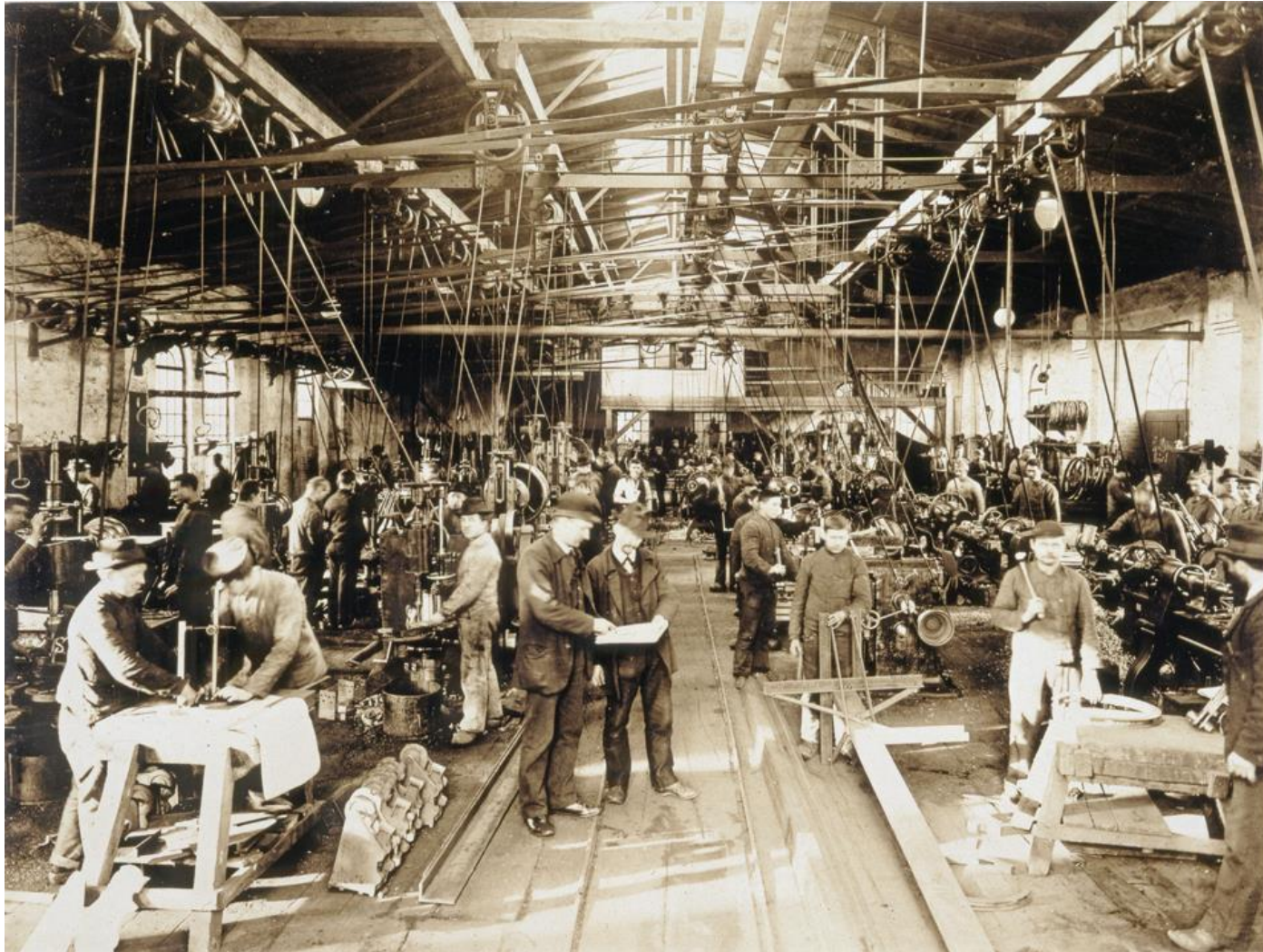
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Oslo

Shaping Digitalisation: From Industry 4.0 to Work 4.0

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Work in the factory, in the 1860s



Work in the factory, present



American-Asian challenges

Google

amazon



SUNTECH



BAOSTEEL

TESLA



PetroChina



UBER

I. Main questions

1. What are the central challenges of digitalisation?
2. Which perspectives do the main actors see in digitalisation?
3. How do governments, employers' associations and trade unions, as central actors of the German model, respond to the challenges of digitalisation?

II. Global perspectives on digitalisation

- Industry 4.0 as key to German economy
- “Industrial core” could be preserved in Germany
- Germany is one of the countries with the strongest industrial core
- Positive influence of the industrial sector on the service sector
- Business services are increasing, social services stagnating

Employment and gross value added in manufacturing industry and the service sector in Germany (%)

	1970	1980	1990	2000	2010	2016
Employment: manufacturing sector	35.8	31.2	28.3	19.6	17.4	17.3
Employment: service sector	45.1	53.8	59.9	69.6	73.9	74.4
Gross value added: manufacturing sector	36.5	31.0	29.2	23.0	22.2	22.9
Gross value added: service sector	48.3	56.6	61.0	68.0	69.1	68.9

Source: Statistisches Bundesamt 2017; own research.

III. Challenges of digitalisation

1. Technological change

- Robotics and AI open new automation and rationalisation potentials
 - **Result:** Human-machine interaction (“Smart factories”)
 - **Problem:** Control and monitoring possibilities

Challenges

- Insufficient broadband infrastructure
- Lack of adaptation to new business processes
- Lack of investment and a digitalisation strategy of companies
- Lack of standards and interface solutions

2. Employment

- Significant potential for rationalisation
- Substitutability across the entire qualification spectrum
 - 47% of all employees in the USA (Frey & Osborne 2013)
 - 48% of all employees in Germany (McKinsey 2017)
 - 42% of all employees in Germany (Bonin et al. 2013)
- Polarization on the labour market
 - Qualified vs. Non-qualified
 - Devaluation of qualifications
- Shifts between sectors and companies



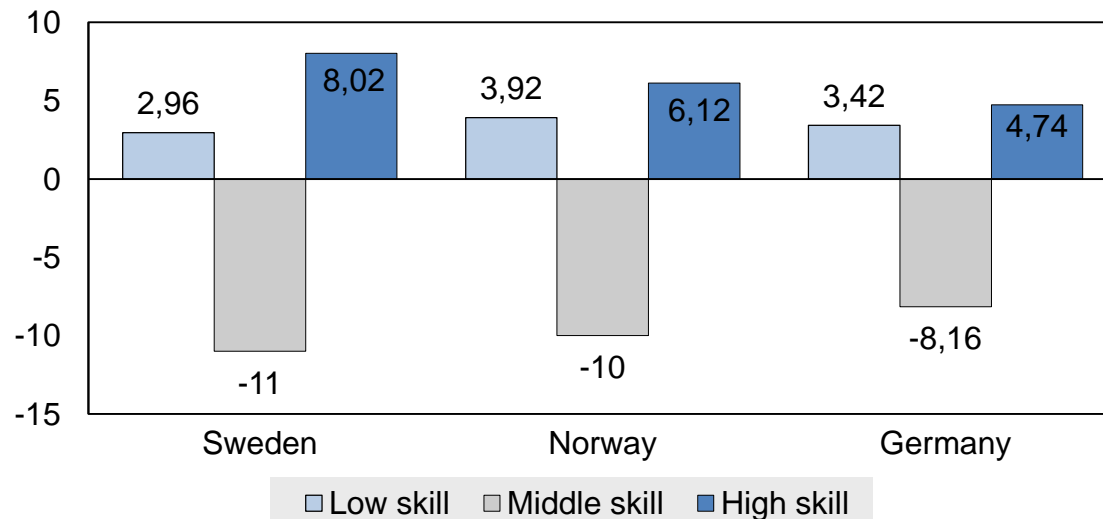
Spiegel 38/2016

III. Challenges of digitalisation

3. Qualification

- Polarization of qualifications
 - Erosion of the middle qualification segment
 - Rationalization potential of well-structured and rule-oriented job profiles
 - **Question:** Up or down in the middle qualification segment?

Percentage change in the share of total employment by qualification, 1995 to 2015



III. Challenges of digitalisation

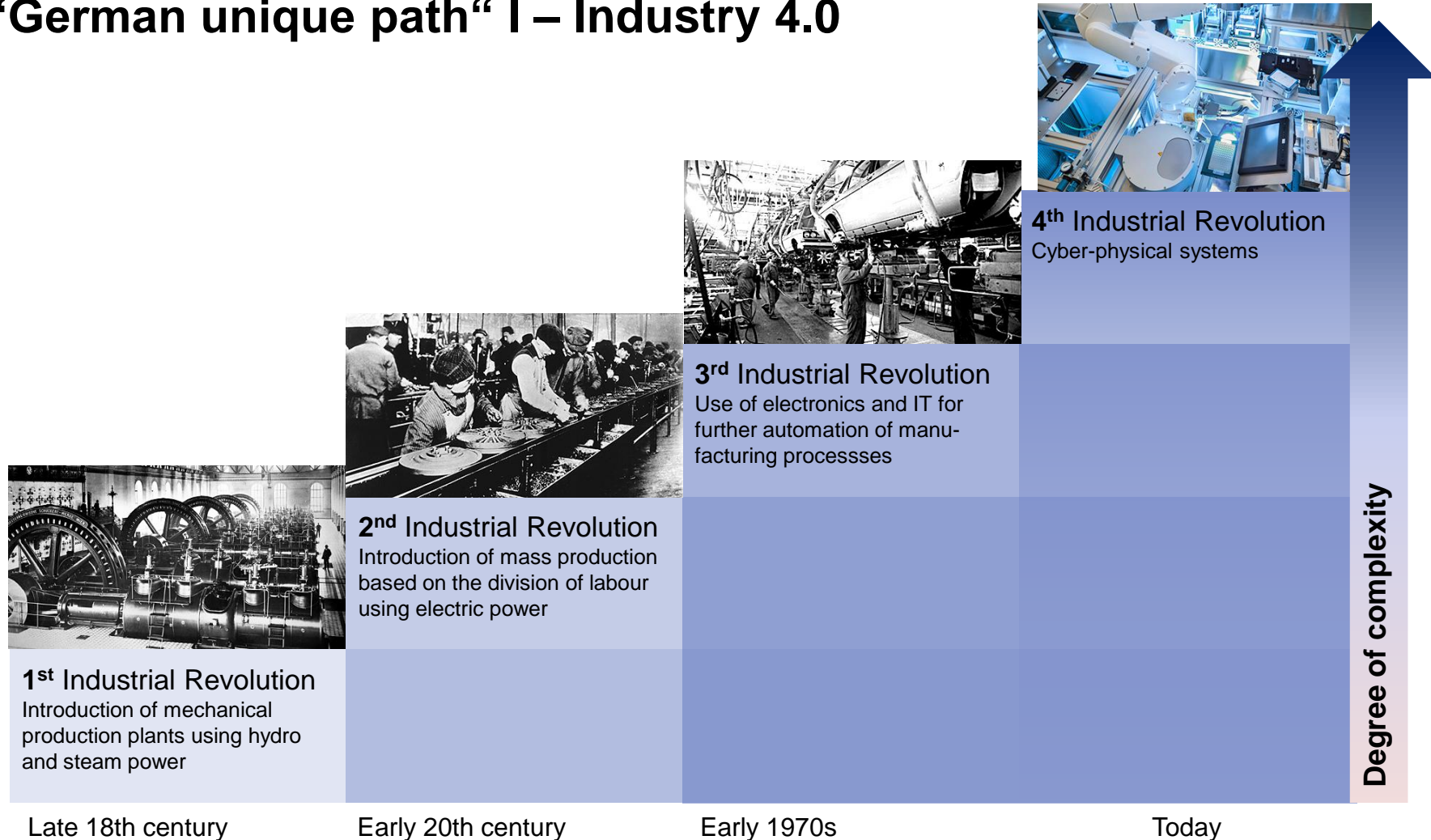
4. Transformation of work

- More time- and location-independent work
 - reconciliation of work and private life
 - removal of boundaries between work and leisure through one-sided flexibility
 - work intensification
- New control possibilities due to emerging data
- New forms of employment – Crowdfunding
 - Working relationship beyond the traditional employer-employee relationship through platforms
 - Global competitive situation for crowdworkers
 - No protection and participation rights

Core elements of the German Model

- Diversified quality products
- Sectoral specialization
- Path-dependent, research-intensive, export-oriented industry
- Strong medium-sized businesses
- Skilled workers regime (promoting productivity and innovation)

“German unique path“ I – Industry 4.0



Fotos: 1. Fotograf unbekannt/ Wienstrom/ Wikimedia 2. akg-images/ dpa/ Picture-Alliance 3. Klaus Rose/ dpa/ Picture-Alliance, Fraunhofer IGD

Cooperative stakeholder participation

- **German "middle way" between:**
 - **Market-based American perspective:** disruptive character of the companies in Silicon Valley
 - **State-centered Chinese perspective:** top-down control

- **Germany:**
 - government resources and systematic involvement of relevant actors
 - Cooperative political-economic system consisting of state, business, science and associations
 - **Coordinated approach:** relevant to break up technical-economic fixation and integrate social and societal opportunities (acceptance and legitimacy)

a) Plattform Industry 4.0



- **Start:** 2015
- **Actors**
 - Ministry of Economics and Ministry of Research
 - Business associations and Trade Unions
- **target setting:** Acceleration of the introduction of Industry 4.0 technologies & provide appropriate framework conditions
- **Main topics**
 - Model solutions, standardization
 - Research and innovation
 - Security of networked systems
 - Legal framework
 - Work, education and training

b. Alliance “Future of Industry“

- **Initial situation:** Creation of a politically mobilising framework that promotes acceptance of industrial modernization processes
- **Foundation:** 03.03.2015 in Berlin with 17 cooperation partners (lead IG Metall, BDI and Minister of Economic Affairs Gabriel)
- **Objective:** Binding of industrial policy competences and optimization of coordination and coordination processes



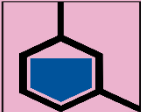









b. Alliance “Future of Industry“

- Improving the political framework
- Increasing industry acceptance
- Safeguarding competitiveness through investment and innovation
- Free trade and fair competition
- Strengthening industrial policy in the EU
- Securing the skilled workers

IV. Technological innovations: Modernisation of industry

b. Alliance “Future of Industry“

Working Groups & Composition

working group	Head of the working group	
WG 1: Acceptance - Attractive industry	 VCI	
WG 2: Industry with high investment potential		
WG 3: Future of work in industry and industry-related services		
WG 4: Value added structures of the future		
WG 5: International competitiveness of German industry		

Green and White Paper “Working 4.0” dialogue process

- **Initiator: Ministry of Labour**
- **Period: 2015 to 2016**
- **target setting:**
 - Overcome the technology-centered discourse
 - Technical innovations should accompany social innovations
 - options for policy-making and action to exploit opportunities and minimize risks of the digitalisation
 - Consideration of all relevant actors from society, politics, science and business



Special feature: Double dialogue process

- Normal "expert dialogue (expert workshops) and "public dialogue" (social media, citizen survey, film festival)

V. Social innovations: work in digitalisation

Dialogue process: Risk I - Massive job cuts

- Considerable rationalisation potential
- Devaluation of existing qualifications
- professional skills requirements are increasing
- Polarisation in the labour market
- Shifts between sectors and companies
- At the same time: Demographic change exacerbates the shortage of skilled workers

Dialogue process: Answer I – Qualification

- Qualification and further education
 - Need for lifelong learning
- Federal Employment Agency:
 - Enlargement of tasks: advising employees on qualification issues
- Goals and ideas:
 - from unemployment insurance → to employment insurance
 - Legal entitlement to further training
 - unemployment benefit Q
 - Personal employment account

V. Social innovations: work in digitalisation

Dialogue process: Answer II - Fair flexibility compromise

- Right of non-availability
 - Company example: BMW and VW
 - Specified in works agreements
- Life-phase oriented labor and social policy
 - Compromise from double flexibility requirements
 - “Wahlarbeitszeitgesetz” [“Elective Working Hours Act”] (flexible working through opening clauses)
 - Collective bargaining agreements, testing of new working time models
- Combination of laws and collective agreements
 - Ensures operational accuracy of fit

VI. Regulatory Perspectives on Crowdfunding

- Crowdfunding as a synonym for the transformation of labor markets
- Internet platforms mediate between client (crowdfunder) and contractor (crowdfunder)
- New form of contract award changes working conditions and organization
 - Activity no longer takes place on the shop floor
 - Changes in the contractual relationship
 - Crowdfunders are regarded as solo self-employed
 - **Consequence:** Existing forms of social security lose their validity
 - **Consequence:** Crowdfunders lack all rights that affect dependent employee status
- Crowdfunding as a field in which the positions of trade unions and employers conflict with each other
- Extensive trade union activities are opposed to passive attitude and demands for deregulation of the employers(associations)

VI. Regulatory Perspectives on Crowdfunding

How to deal with crowdfunding?

- **Employment status:** Classification between self-employed, dependent employees third case.
- **Social protection:** Existing legal regulations and rights are linked to employee status.
- **Earnings:** Existing statutory regulations on minimum wages do not apply to self-employed persons when they freely form their contracts.
- **Co-determination and representation of interests:** Company co-determination rights are linked to the concept of a company. Antitrust and competition law limits the self-organization of self-employed persons.

VII. Conclusion: Shaping digital change

Starting point

- Digitalisation and Industry 4.0 as the basis for a new economic cycle.
- Requires broad operational and social approval
- Early stage opens up far-reaching possibilities for design
- **Recognition:** Discourse restricted to technological issues is inadequate to the economic and social requirements and challenges of digitalisation
 - Thinking technological and social innovations together
 - Possibilities of digitalisation must contribute to social innovation
- Requires interlocking of relevant social actors from the state, associations, civil society and academia to reduce risks and enhance opportunities
- The policy initiatives Work 4.0 and Industry 4.0 use cooperative platforms to sound out common standpoints between the participating actors.

Thank you for your attention!