Smart Unions for New Industry

National Report

GERMANY

Case Study on IG Metall

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Introduction

At this point, any forecast concerning the development of employment or qualification as a result of Industry 4.0 is inevitably speculative. Nevertheless, research shows that the development itself is not deterministic, there are plenty scopes of action for the configuration of innovations. The German model of co-determination provides many possibilities to shape and create the digital transformation in line with the demands of the workforce. For the union selected as a case study, IG Metall, the topic of Industry 4.0 is of high relevance for two reasons: First of all, the manufacturing industry in Germany is still considered to be the backbone of the economy, especially when it comes to export products. Secondly, Industry 4.0 addresses innovation in manufacturing processes directly with the so called 'cyber-physical production systems'. At the beginning, the debate was merely technology-driven and focused on the possibilities of improving efficiency and optimizing workflows and supply chains using digitization. But early on, the understanding arose that technological innovations are embedded in socio-technical systems and therefore subject to integral transformation processes. This understanding was established and promoted also by the unions, with IG Metall leading the way as a promoter in the process. In case of the IG Metall, the union pursues a pro-active strategy characterized by agenda setting in different spheres, a high level of networking activities and a cooperative approach. Nevertheless, lines of conflict between the employers and the unions respectively the workers representatives emerge and emphasize the need for negotiation and co-creation. In addition to that, external influences affect the action frame of reference. This report highlights the national features of the German model in connection with the distinctiveness of the union selected as the case study, the IG Metall. In the first section, the report illustrates the governmental plans for Industry 4.0 and chronologically illustrates the development stages of the German debate (section 1). Afterwards, the main features of industrial relations in the metalworking sector are explained (section 2), which provides an important framework for negotiation processes and collaborative traditions in the industry. The third section combines the topic of Industry 4.0 with the industrial relations and provides an overview of the perspectives of trade unions and employers' associations in the metalworking sector on Industry 4.0. Here, specific lines of conflict between the social partners

emerge and light is shed on the different perspectives on digitalization. In the last section, the focus is sharpened on the IG Metall as a case study. In this section, the trade union discourse on the topic is analyzed (4.2), as well as the trade union actions (4.3). The report ends with a short conclusion of the findings.

Section 1.
Governmental plans for Industry 4.0

In 2000, representatives of the European Union´s national governments met in Lisbon and developed the 'Lisbon Strategy' which set the ambitious goal to make the EU the most competitive and dynamic knowledge-based economy in the world by 2010. As the agreed targets were too optimistic and therefore could not be achieved, the program was adjusted. One of the main objectives of the modified Lisbon Strategy was to promote research, education and innovation with three per cent of GDP[1]. As part of this reorientation, the High-Tech Strategy 2020 of the Federal Republic of Germany was drawn up at national level in 2006 and further developed in 2010. With the aim of promoting Germany's innovative strength, R&D expenditure increased from EUR 8.5 billion to EUR 14 billion between 2000 and 2013 (Deutscher Bundestag, 2013). The Federal Government's High-Tech Strategy was supported by the Research Union Economy – Science of the BMBF, which set up the promoter group 'Kommunikation' for this purpose. At the end of 2011, the working group 'Industrie 4.0' was founded under the chairmanship of Henning Kagermann (spokesman of the promoter group Kommunikation) and Wolfgang Wahlster, who created the term 'Industrie 4.0' together with Wolf-Dieter Lukas and promoted it to the public for the first time at the Hanover Fair 2011 (Kagermann, Wahlster, Helbig, 2013). The concept industry 4.0 stands for the fourth industrial age[2] which can be accessed through the use of Cyber physical Systems (CPS)[3] on the basis of which entire value-added processes can be controlled autonomously and with minimum response times, thus enabling completely new business models to be created. Industry 4.0

[1] https://www.bundesregierung.de/Content/DE/Lexikon/EUGlossar/L/2005-11-21-lissabon-strategie.html.

[2] After mechanization by water and steam power at the end of the 18th century (first industrial revolution), the electrification and use of mass production at the beginning of the 20th century (second industrial revolution) and the computerization and automation of production processes since the 1970s (third industrial revolution), the German economy is now facing the fourth industrial revolution.

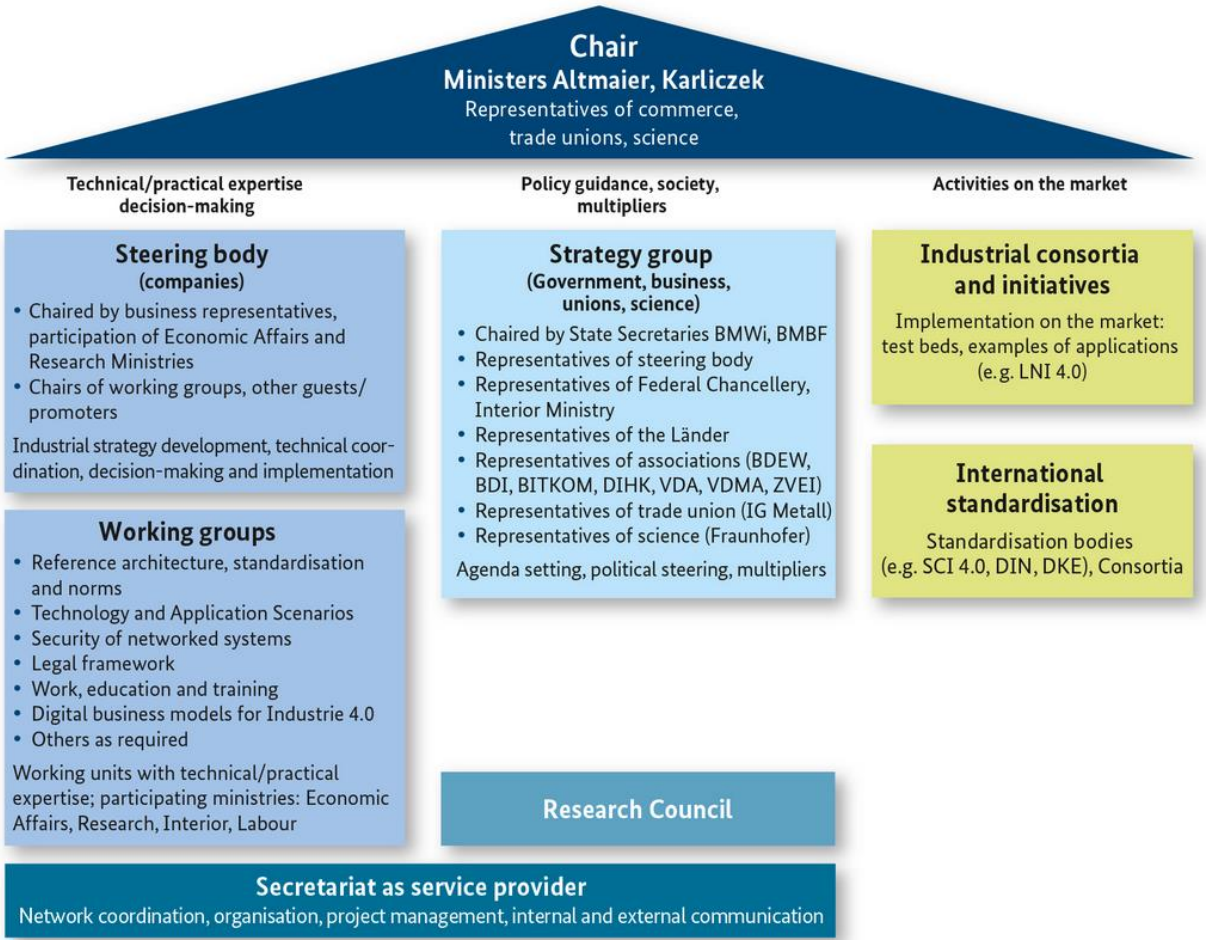
[3] Objects up to everyday objects are controlled intelligently by programmability, memory, sensors and communication skills. They can be used over the Internet and through so-called machine-to-machine communication constantly exchange information, initiate actions and control each other. The physical world (physics) merges with the virtual world, 'cyberspace'.

should integrate real and virtual production worlds and products, production facilities and objects with embedded software to intelligent and distributed systems. This represents a new level of automation and the use of information and communication technologies in the field of industrial production. “The paradigm shift, especially with respect to the implications in the manufacturing sector, also provides competitive potential for Germany’s strongest industrial sector” (Ittermann et al., 2015, 11; Kagermann, 2012, 21f.).

In October 2012, the working group ‘Industrie 4.0’ handed over its report with recommendations for the future project Industry 4.0. In 2013, the ‘Plattform Industrie 4.0’ was founded as a result of a cooperation agreement between the associations BITKOM, VDMA and ZVEI with the aim of continuing and further developing the project Industry 4.0. In April 2015, the ‘Plattform Industrie 4.0’ was expanded by more actors from companies, associations, science, politics and unions. At present, the platform is led by the federal minister for economic affairs and energy (BMWi), Peter Altmaier and the federal minister of education and research (BMBF), Anja Karliczek, as well as high-ranking representatives from industry, science and the trade unions. The platform comprises steering body and working groups, in which business representatives and experts work on technical implementations of Industry 4.0 strategies. These are accompanied by a strategic group consisting of representatives from politics, industry associations, science, trade unions, federal government departments and the federal states. Their task is to provide policy leadership and multiplication effects in the sociopolitical debate on the effects of Industry 4.0. The social partners are represented by Prof. Dieter Kempf from the Federation of German Industries (BDI) and Jörg Hofmann from IG Metall (IGM)[4].

[4] http://www.plattform-i40.de/I40/Navigation/EN/ThePlatform/PlattformIndustrie40/plattform-industrie-40.html.

Figure 1. Industrie 4.0 Platform (Source: www.plattform-i40.de)



In addition, the Federal Government and the federal ministries have initiated various research programs to explore change in Industry 4.0. As part of the research program on 'Autonomik für Industrie 4.0', which has been funded by the BMWi since 2013, 14 research projects deal with the progressive digitalization of the manufacturing industry in Germany. The total funding volume amounts to around EUR 40 million. The BMBF is also pursuing several research programs on the subject of industry 4.0 and under the program title *Industry 4.0 – Innovations for the production of tomorrow* since 2012 various research programs with a funding volume of around EUR 120 million (Ittermann et al., 2015, 21f.).

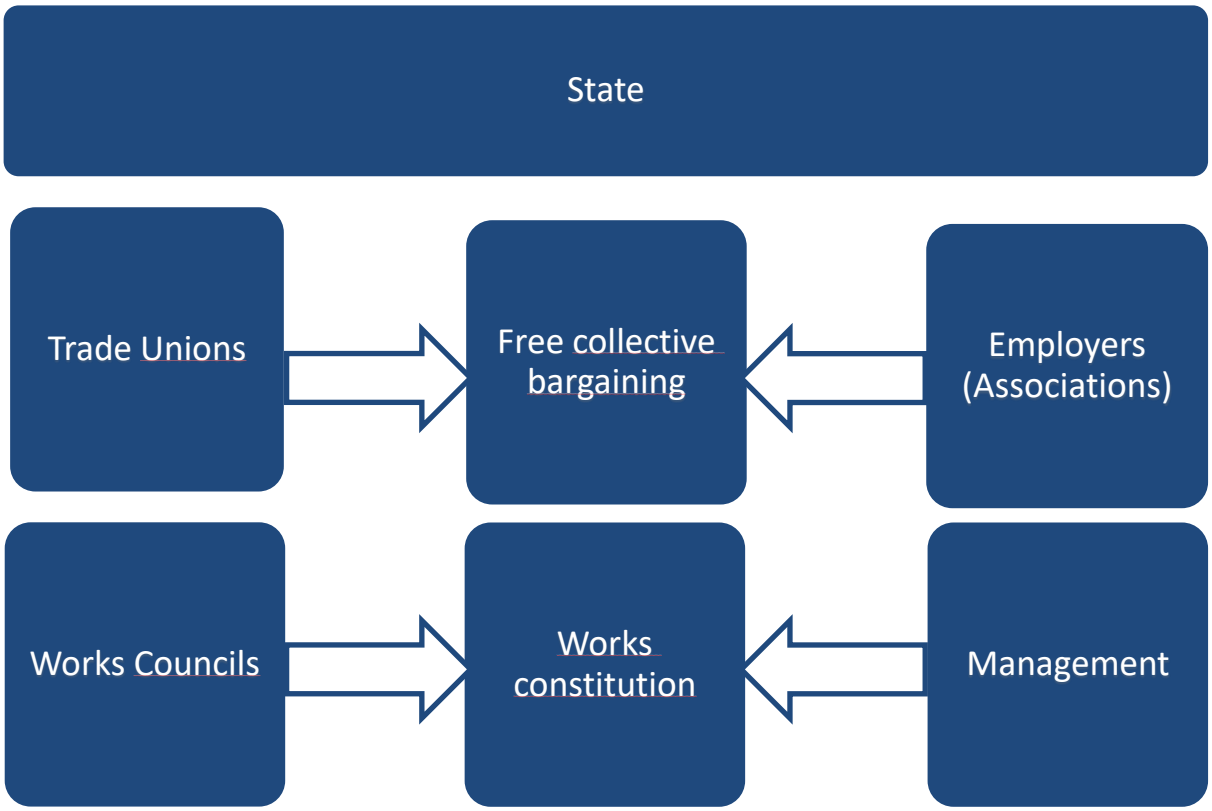
Furthermore, the Federal Ministry of Labour and Social Affairs (BMAS) has addressed the topic of Industry 4.0 and launched a dialogue process with the Green Paper on Work 4.0 2015. With the Green Paper, the BMAS has asked associations, trade unions and companies for their opinion, conducted numerous specialist workshops and thematic events, commissioned scientific studies and obtained opinion leaders. The first results of the dialogue process were published

in the White Paper Work 4.0 in 2016. In particular, the topics of qualification, work time, health protections and data protection are regarded as important future fields of action. There is a consensus between the Federal Government and the social partners that the appropriate qualification of employees is indispensable for the design of Industry 4.0. The topic of working time is more controversial. Here the employers demand changes of the working time law in order to be able to act more flexibly. The employee representatives, on the other hand, fear a reduction in the protection by law of employees. With regard to health protection, the dialogue partners identify both opportunities and risks. Digitization holds the chance to make physical workloads more humane, but at the same time the risk of psychological stress due to changes in work content is growing. The interests of employers and employee representatives must also be weighed up when it comes to data protection. Digital devices and applications collect, use and a growing amount of data. Nevertheless, sensitive data of employees should be protected and its misuse should be prevented. Ultimately, these issues will also have an impact on the future shaping of co-determination. This is where the government and the social partners need to come to new agreements (BMAS, 2016).

Section 2.
Main features of industrial relations in the metalworking sector

Unlike liberal market economies, which have a high degree of deregulation of their labour-relations, the German model embodies a centrally coordinated neo-corporatist model. This model includes a high degree of regulation through a comprehensive institutional infrastructure (Tüselmann, Heise, 2000, 163). The German system of industrial relations is characterized by collective bargaining between employers' associations and trade unions at cross-company level and negotiating processes between management and work councils at the company level. These bi-lateral negotiation processes are both determined by law and delimited from each other. At the cross-company level, collective agreements are concluded between trade unions and employers or employers' associations, which are constituted by the collective bargaining autonomy (*Tarifautonomie*). At company level, the regulations between employee representatives and management are legitimized by the Works Constitution Act (*Betriebsverfassung*). In addition, works agreements can be concluded between these parties (Müller, Jentsch, 2017, 4ff). The right for collective bargaining is assigned to employers' associations and single employers on the one side and trade unions on the other side. Works councils are not allowed to negotiate over matters that are already regulated by collective bargaining, such as pay rates, unless there is an explicit opening clause in the collective accord. Once collective agreements have been concluded they have the force of law, which means that their provisions cannot be undercut and there is a strict peace obligation during their currency. Additionally, the agreements can be declared as generally binding to all companies in an industry by the Ministry of Labour, irrespective of whether they are members of employers' associations or not. Furthermore, the state provides a dense legislative framework on the conduct of industrial conflict (Tüselmann, Heise, 2000, 164).

Figure 2. Industrial Relations System (source: Müller, Jentsch, 2017; Tüselmann, Heise, 2000; own figure)



The first trade unions in Germany were founded in the second half of the 19th century and consisted of associations of craftsmen in professional associations. Later industrial unions and public-servants associations were founded. Until the end of the Weimar Republic, the trade union landscape was divided into professional and political associations. After WW 2, unified trade unions[1] modelled on the industrial unions were formed. The unions, which later merged to form unified multisector-trade unions, continued to comprise blue collar workers as well as white-collar workers (Tüselmann, Heise, 2000, 13ff.). Almost 80% of the approximately eight million German trade union members are organized in the eight single trade unions of the Confederation of German Trade Unions (DGB). The largest of the DGB unions with over 2 million members is the Industrial Union (IG Metall), which mainly represents employees from the metal and electrical industry (Schroeder, Greef, 2014, 127f.). The overwhelming majority of

[1] Unified trade unions (*Einheitsgewerkschaften*) organize blue-collar and white-collar workers in one branch of industry, irrespective of their religious and political world views (Müller, Jentsch, 2017, 27).

employees in the metalworking sector are represented by IG Metall. In addition, there is a Christian metalworkers' union (CGM) which belongs to the Christian Federation of Trade Unions in Germany (CGB). This umbrella organization with a total of 14 individual unions and 280,000 organized members and approx. 100,000 blue-collar workers plays only a subordinate role, as it has little weight as a party to collective bargaining (Greef, 2014, 696f.; Müller, Jentsch, 2017, 26).

IG Metalls' most important negotiating partner in collective bargaining issues is the employers' association Gesamtmetall. Gesamtmetall is the largest member of the Federation of German Employers' Associations (BDA) and represents around 3.650 members companies[2] with approximately 372,000 employees. The degree of organization of Gesamtmetall is approx. 15%.

Since the late 1980s, employers' associations and trade unions have seen a decline in membership. In addition to the resignations, the few new members represent a major problem for the associations. The decreasing number of members of the associations also reduces the scope of the collective bargaining agreements concluded, which weakens employers' associations and trade unions alike (Müller, Jentsch, 2017, 35ff.; Greef, 2014, 723). This trend shows very well how much employers' associations and trade unions, despite their contradictory orientation, depend on each other to represent the interests of their members.

Compliance with collective agreements between employers' associations and trade unions is monitored at company level by the works council. In addition, the work council possesses participation rights in social, personnel and economic matters. These range from mere information to enforceable co-determination rights. The works council is encouraged to work with management in a trustful manner and can conclude works agreements with the management. The works council an institution formally independent of the union, but members of the works council are often unionized and elected into the board via election lists. In addition, works councils are often supported by trade unions in form of advice and training. IG Metall was represented in 10,380 companies with a total of 52,530 works councils in the 2014 elections.

Trade unions are also represented in the bigger companies by shop stewards, who are elected there by the trade union members. In 2012, IG Metall was represented by around 50,000 shop stewards in 2120 companies (Müller, Jentsch, 2017, 50f.).

In addition to co-determination at the company level, there is co-determination of corporations. This allows employee representatives to participate in the Supervisory Board, which monitors the work of the board of directors. A special form of corporate codetermination can be found in companies in the coal and steel

[2] Large companies are more often members of employers' associations than small, younger companies from the service sector. Due to the lack of historical tradition, there are fewer memberships in employers' associations in eastern Germany.

industry since the Supervisory Board is equally composed of representatives of the capital side and representatives of the employees. This form of co-determination provides the most extensive rights to employee representatives, but it has lost much of its importance over time because these sectors have been shrunk considerably over the last decades (Müller, Jentsch, 2017, 56f.).

Section 3.
Overview of the perspectives of trade unions and employers' associations in the metalworking sector on Industry 4.0

The IG Metall was involved in the working groups on the subject of Industry 4.0 at an early stage in order to integrate the human factor into the engineering discourse. It pursues the goal of anchoring a human-policy with a socio-technical mission in the change processes of companies.

Section 1 already described the joint project Platform Industry 4.0 in which IG Metall is represented and performs a steering function. This action clearly shows that the trade union's goal is to shape change right from the start and not to impede it under any circumstances. This is also underlined by IG Metalls' foundation of the advisory board 'Zukunft der Arbeit' (ZdA) consisting of executive committees and works councils members from companies in the metal and electrical industry as well as scientists and state secretaries[1]. The aim of the ZdA is to identify changes in the world of work at an early stage and creating possibilities of shaping future work for employees (ZdA, 2015). The demand of ZdA is that future work should center the interests of the employed and be human[2]. The focus is on the possible effects on co-determination and the employment structure of companies as well as questions of data protection and the qualification of employees (ZdA, 2015).

The employers' association Gesamtmetall also sees digitization as a potential opportunity for Germany as an industrial location. Similarly to the IG Metall, the association emphasizes in a position paper on the Green Paper on Work 4.0 the outstanding importance of the qualification of employees. However Gesamtmetall also refers to the need for companies to be competitive. For this purpose, it would be necessary to allow more flexibility in working issues and to strengthen the autonomy of employees. Gesamtmetall therefore criticizes the Green Paper for focusing too much on workers' rights and calls for a reduction in working time legislation. Furthermore, the association warns against extending the rights of co-

[1] Some of the advisory boards members are also represented in the joint project plattform industrie 4.0.

[2] This follows on from the debate about humanisation of work that took place in the 1970s.

determination and advocates an employer-oriented modification of the legal situation (Gesamtmetall, 2015). In the latter two points in particular, Gesamtmetall and IG Metall hold diametrical positions.

In addition, some further associations are also represented on the Industry 4.0 platform mentioned above. Besides the Federal Association of German Industry (BDI), the German Association of the Automotive Industry (VDA), the German Engineering Federation (VDMA) and the German Electrical and Electronic Manufacturers' Association (ZVEI) are organized there.

Section 4.
The role of trade unions in Industry 4.0: The case of IG Metall

4.1. Brief overview: Industriegewerkschaft Metall

This section contains some facts and figures about IG Metall, which has already been briefly presented in Section 2, as it is the largest union in the metalworking industry to be dealt with in this case study. IG Metall emerged from the German Metalworkers' Association founded in Frankfurt am Main in 1891. The integration of the Textile Clothing Union and the Wood and Plastics Union into IG Metall at the end of the 1990s ensured that it developed into a multi-sector union representing the interests of employees in different branches (Müller, Jentsch, 2017, 27). Today, IG Metall still represents companies in the metal, textile and the wood and plastics processing industry as well as their associated industries (IG Metall, 2015a).

Consisting of 2,270,000 members (2015), IG Metall is the largest union in the DGB and the largest representation of employees in the metal working sector. Although the share of female members is with 18 % the lowest rate of all unions in DGB (Greef, 2014, 674ff.; Müller, Jentsch, 2017, 27f.).

The structure of IG Metall is divided into three levels: regional, district and federal. In total, there are 164 regional administrative offices apportioned among 7 districts. These are headed by the Executive Board at the headquarters in Frankfurt am Main. The democratic structure of the IG Metall is ensured through regular delegate assemblies and annual district conferences, as well as a four-yearly trade union conference. In the bodies and committees of IG Metall, women must be at least be represented by their share of the membership (Greef, 2014, 706; IGM Satzung, 2015).

IG Metall can look back on several major walkouts. In the 1950s, there were strikes lasting several weeks in which wage increases and continued pay in the event of illness were the subject of conflict. The strike on sick pay in 1956/57 lasted 16 weeks and is still one the longest industrial action that took place in (West) Germany after the Second World War and could finally be successfully implemented for the employees. Since the end of the 1970s, IG Metall has been struggling to reduce working hours to 35 hours per week. With an area-wide strike

in several German states in 1984, IG Metall was partially successful in reducing working hours to 38.5 hours. In the following years, the goal was gradually approached and the 35-hour-week was then step by step implemented in the companies (Müller, Jentsch, 2017, 34). This year, IG Metall is demanding an option to reduce working hours to 28 hours (for a period of up to 24 months) and a pay increase of 6% in the collective bargaining process[1].

IG Metall sees itself as an independent trade union that refuses to be influenced by governments, politics, companies, denominations and world views. Its mission is to promote the economic, social, professional and cultural interests of its members. In addition to the conclusion of collective agreements, IG Metall is committed to the enforcement of co-determination rights and the occupational health protection in the companies. IG Metall also promotes equality between men and women and equal participation of handicapped persons. Besides providing financial support to members in the event of industrial action and lockouts, the union provides legal protection, support for pensioners and for relatives affected in the event of death. IG Metall membership fees amount to one percent of gross monthly income. As all union membership fees, the dues are tax-deductible under income-related expenses.

Due to the background of globalization, IG Metall is pushing for stronger international trade union cooperation. In addition to its membership in the DGB, IG Metall is therefore also organized at international level in the IndustriALL GLOBAL trade union and the European trade union industriALL (IGM Satzung, 2015).

4.2. Trade union discourse

In order to illustrate the trade unions' discourse on Industry 4.0 and to identify influencing factors in the debate, the approach of the SWOT analysis is used. The central idea behind the SWOT analysis is to combine promoting and inhibiting internal and external factors of a situation in order to analyze possible strategies to pursuit a specific goal. A common pitfall when it comes to SWOT analysis is the missing declaration of a target situation. Therefore, the topic at hand is the description of an objective with regard to the union's position towards industry 4.0. With regard to the situation of IG Metall, the challenges to meet are mainly rooted on two levels – the strategic influence of the union on labor policy topics in politics and research as well as the operative provision of competence for the workers representatives to strengthen co-determination in Industry 4.0 on the company level. The aim of the SWOT analysis is to identify relevant

[1] https://www.igmetall.de/metall-tarifrunde-ig-metall-vorstand-beschliesst-forderung-26090.htm.

constellations to pursue these challenges. The content of the SWOT analysis was obtained by various sources, including interviews and presentations of the union.

4.2.1. Strength

The dimension of strength is located on the promoting internal side within the matrix. With regard to IG Metall, one of its central strength is the involvement of the union at a very early stage of the debate (see also section 1) as it is a key player in the discourse and in the political and the research scene (Kurz, 2014). This involvement can be characterized as a constructive dialogue between the stakeholders with a strong emphasis on placing labor policy issues in a former merely technical-driven development. Furthermore, the union takes over a rather proactive role instead of a reactive role in the debate. Due to this course of action, not only the debate, but also the calls for research proposals by the ministries assign a central role to human factors and the participative change process in firms and organizations. In contrast to former debates, especially in comparison to the CIM (Computer Integrated Manufacturing)- debate in the 1980s, the guiding principle in the current debate is the human as the "director of the creation of value" (Malanowski, Brandt, 2014, 39). The cooperation activities of IG Metall with various stakeholders concerning digitalization can be described as high, even on an international scale. Nevertheless, the unions' role is also admonitory and raises awareness for the pitfalls of automatization and digitalization for the workforce (Kurz, 2014). On the company level, IG Metall developed a variety of qualification programs to strengthen the co-determination at the company level. Workers representatives are faces with a growing complexity of subjects for negotiation and therefore they need extensive and specified training (Oerder 2016). These qualification programs enable workers representatives to become co-creators in the company transformation process on equal terms with the management. Therefore, qualification programs such as 'Arbeit und Innovation' are collaboratively implemented between the social partners. This also reflects the cooperative approach of the union in this matter, which also enables workers representatives to operate as co-creators of the digital transformation at the company level.

4.2.2. Weakness

The dimension 'weakness' is located on the inhibiting internal side within the matrix. Weakness factors as such are internal impacts that can possibly undermine

the target situation. Not only for IG Metall, but also for other unions, a typical weakening factor when it comes to Industry 4.0 is the challenge to attract high-skilled workers, especially in the ICT-sector (Frerichs et al., 2004). However, this is a relevant target group when it comes to the strategy and the shaping of Industry 4.0 projects. Another relevant issue when it comes to the digital transformation is the below-average representation in SMEs (small and medium enterprises) with respect to works councils. Only 10 % of SME between 5 and 500 employees have a works council at command (Greifenstein, Weber, 2008), even though the share is 5 percentage points higher in the metal-working industry (Ellguth, Kohaut, 2017). But because of the relevance of SMEs with respect to the number of employees and the role in the industry[2], this low level of representation is a problem for the union.

4.2.3. Opportunities

The dimension ‘opportunities’ is located on the promoting external side within the matrix. Opportunities arise merely from the relatively high degree of organization, although memberships on both sides are declining (see section 2). Nevertheless, in comparison to other sectors, the degree of organizing in the metal- and electricity sector is still relatively high and enables assertiveness and pervasiveness of results from collective bargaining. Also the political constellation on the federal level can be accounted as an opportunity factor. Historically and ideally linked, the participation of the Social Democratic Party enables the emphasis of labor policy issues in different channels.

4.2.4. Threats

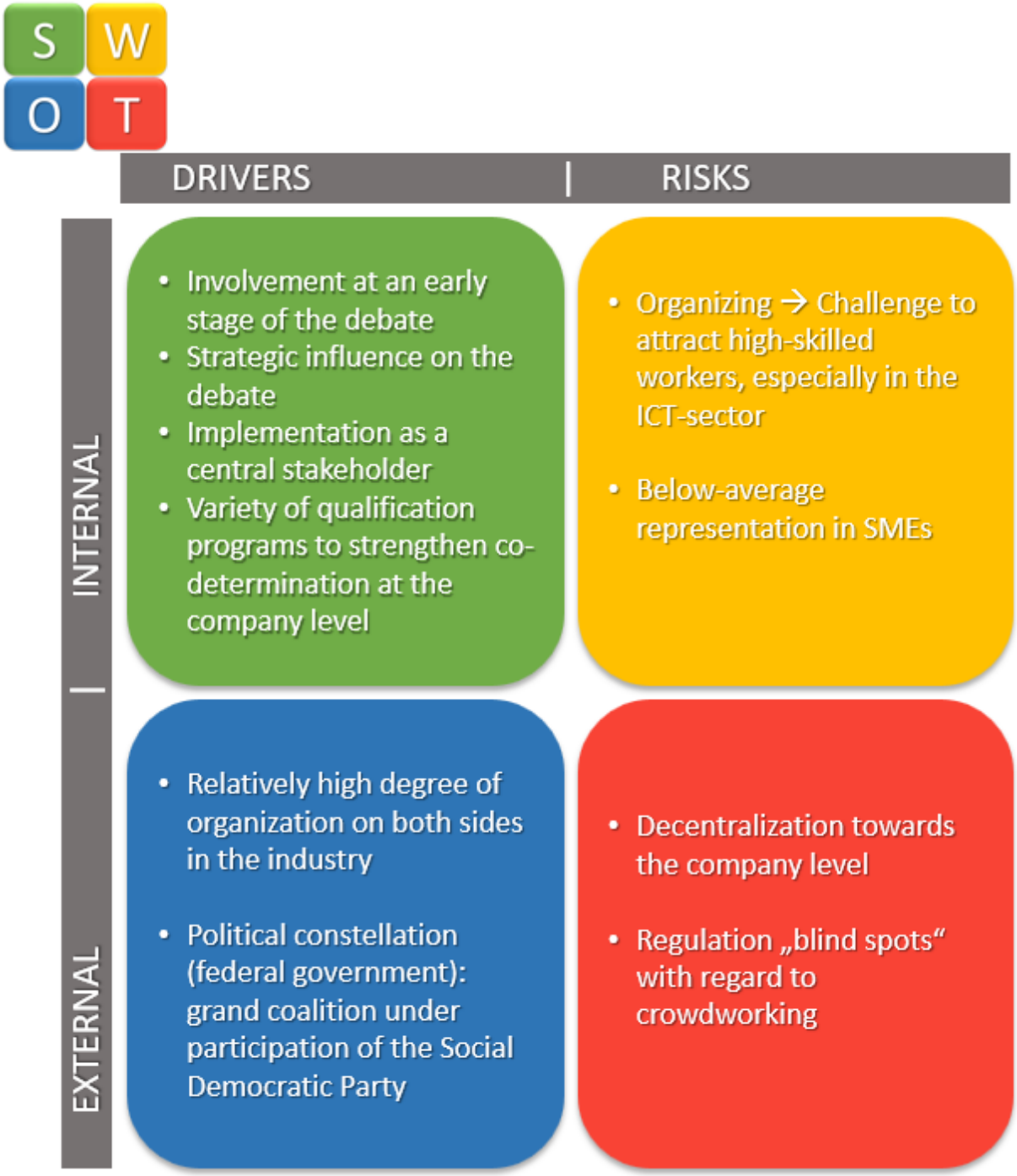
The dimension ‘threats’ is located on the inhibiting external side within the matrix. A potential threat concerning the assertiveness of collective bargaining is the decentralization towards the company level. This development is empirically observed since the 1980s and describes the tendency of regulations being made rather on a company than a cross-company level (Nienhüser, Hoßfeld, 2010, 126). Apart from undermining threats concerning sectoral agreements that come along with this development, decentralization requires proficient worker representation on the company level (Ellguth, Kohaut, 2015, 293). One substantial threat,

[2] According to the Federal Office of Statistics, in 2015 61% of the German workforce were employed at SMEs. In the official statistic, SMEs are defined by their number of employees and their annual turnover. A company is defined as a SME if no more than 249 people are employed and the annual turnover does not exceed EUR 50 Million (Destatis, 2015).

especially when it comes to Industry 4.0, are furthermore the regulation ‘blind sports’ that emerge with the phenomenon of crowdworking. Self-employed persons are able to join IG Metall since 2016, yet the opportunities of regulation in the field of crowdworking are limited. Christiane Brenner about the relevance of this phenomenon: We see that “a rising number of employers contracts certain orders out via so called ‘intermediaries’, that are platforms on the internet, to a seemingly anonymous mass” (IG Metall, 2014). The working conditions are highly dependent on conditions the platform provides, but research shows, that a number of platforms operate under general terms and conditions of business, that disfavor the rights of crowdworkers and sometimes even violate laws in force (IG Metall, 2015b).

The following figure shows the summary of the four dimensions in a matrix to give an overview of the analysis. Subsequently, a combination of factors will be executed in order to identify guidance lines in pursuing the goal.

Figure 1. SWOT matrix for IG Metall concerning Industry 4.0 (own figure)



At first glance, one can see that the S-O combination of factors shows promising internal and external conditions for the union to further pursue their goal. The strategy IG Metall pursued in the debate since the beginning proved effective. Trough forming a coalition with other relevant stakeholders, IG Metall not only

became a key player in the setting, but could also develop resources for their own organization. Their most important qualification program for workers representatives, is co-funded by the ESF and the federal ministry of Labour and Social Affairs. On the other hand, conservative and neoliberal forces are on the rise since many years which traditionally aim to constrain union influences either directly (e. g. limiting the rights to strike) or indirectly through measures of deregulation, privatization or cutbacks in social security benefits (Frerichts et al. 2004). The political climate can be characterized as ambivalent, which can become a challenge for IG Metall with regard to political agenda setting. Keeping this in mind, IG Metall can further develop their strategy to remain a key player in the debate and the creation of labor standards under the changing framework.

Considering the W-T combination of factors, relevant challenges arise for the union on two levels: Regulation and Organizing. With regard to regulation, decentralization is a potential risk to the bargaining framework of the union, the range of influence on a lager scale. When it comes to the regulation of new forms of employment, especially issues that arise from platform-based work such as crowdworking, gain in importance. IG Metall has been – together with ver.di – successful in raising unionistic awareness for the topic and develop certain standards and even a platform for crowdworkers[3]. The platforms aims to improve transparency on providers and working conditions, enables communication and exchange of experiences among the crowdworkers and offers consulting services. Nevertheless, regulation blind spots remain and might become a more prevalent issue in the future.

Furthermore, organizing issues affect the unions strength and assertiveness to a certain extent. The difficulties to attract high-skilled workers, especially in the ICT sector and the representational issues in SMEs might jeopardize the strategic position of the union in the future. Concerning the latter, IG Metall developed in every district strategic development programs under the slogan “no metal business without workers representation”. In order to archive this goal, IG Metall supplied more resources to development activities and fostered this topic as a strategic objective[4]. Susanne Kim, the head of the development department at IG Metall, gives an outline on the future goals of the union: “The IG Metall wants to make further progress from a good support union to a successful development union” (N.N., 2016). This strategy addresses also the recruitment of (underrepresented) target groups, among others the organizing of high-skilled workers. In the next segment, further actions of the unions to address Industry 4.0 related topics are described.

[3] See http://faircrowd.work/de/.

[4] The associated campaign is called „Mehr werden” (english: *Let’s gain members*): https://www.igmetall-mehr-werden.de/.

4.3. Trade union action

The actions taken by IG Metall can be characterized under an agenda setting approach and an active rather than a reactive role when it comes to dealing with issues of Industry 4.0. The agenda setting approach is reflected not only in the research landscape of state-funded projects, but also in the political arena. Another relevant action is the extensive qualification strategy for workers representatives on the company level.

With regard to Industry 4.0 research initiatives funded by state ministries, IG Metall co-created the call for proposals in order to emphasize the role and the scopes of action for the employees. Human factors and the socio-technical approach are central guidelines when it comes to the creation of research initiatives. Furthermore, IG Metall not only set the stage for the direction of research projects, but is also involved as an associated partner in many research projects (for an overview see Ittermann et al., 2015). For example, IG Metall was associated partner of a research project that developed an intelligent, adaptive, mobile and context-sensitive assistance system (APPsist) that is in line with the guiding principle of the employees being the "director of the creation of value" (Malanowski, Brandt, 2014, 39). Also more specific relevant topics were subject of consultation, such as data security and data reduction.

Furthermore, the topic of Industry 4.0 was embedded in many union campaigns and initiatives, to put the topic on the map and to point out relevant regulation and figuration issues. For example, the campaign on working time 'Mein Leben – Meine Zeit' (english: *My Life – My Time*, see https://www.igmetall.de/arbeitszeit.htm) has a direct connection to issues of mobile work. In addition to embedding Industry 4.0 in campaigns, the union provides a lot of detailed information on their website. The information contains of various interviews with experts and unionists, explanatory videos, scientific studies and examples of good practice (https://www.igmetall.de/archiv-themen-wirtschaft-industrie_4-0-12794.htm). Another important initiative that illustrates the approach of IG Metall concerning labor policy topics in Industry 4.0 is the establishment of the 'Frankfurt Paper on platform-based work'[5], which was developed by an international consortium "to avoid 'digital feudalism' […] [and] to bring democracy to these new digital workplaces" (IG Metall, 2016).

5 https://www.igmetall.de/docs_20161214_Frankfurt_Paper_on_Platform_Based_Work_EN_b939ef89f7e5f3a639cd6a1a930feffd8f55cecb.pdf.

For workers representatives, a very helpful but not union-specific offer is the archive on works agreements, which is operated by the Hans-Böckler-Foundation in Düsseldorf. Not only does the archive provide works agreements according to certain topics, it also contains various analysis of works agreements according to their effectiveness and therefore provides workers representatives with competence in the negotiation of certain topics. Most recently, a study on works agreements concerning labor 4.0 was published that highlights the necessity of regulation to prevent further stress, the dissolution between work and life and to reduce the workload. Through works agreements, workers representatives create the conditions for their colleagues under which the digital transformation takes place (Maschke et al., 2018).

Concerning training and qualification, IG Metall has different projects to ensure that the workers representatives are the co-creators of the digital transformation at the company level. For example, the goal of the joint trade union project Work 2020 in North Rhine-Westphalia is the practical support of works councils, employees and companies in shaping future (digital) work. The project is carried out by DBG NRW, as well as the state branches of the member unions: IG Metall NRW, IG BCE North Rhine and NGG BRW. Trade unions are therefore keen to involve works councils and employees in the design processes of digitization at an early stage and to design technology in a humane manner. Currently, 14 companies in collaboration with works councils, company advisors and project teams are analyzing working and organizational forms and developing fields of action. The topics include workloads, downgrading/upgrading of work, possibilities of technology design and qualification measures for employees. Through new forms of employee participation, transfer workshops and a cross-company exchange, digitization change processes are to be shaped jointly and successfully (IG Metall, 2017). Another IG Metall initiative to shape future work is the project series Arbeit+Inno>ation. Here, the participating project companies have the opportunity to have selected employees and works councils trained so that they can proactively support and shape these technological processes in the companies. The aim of the project is to set innovation processes in motion by the trained employee representatives and to promote changes in the company in a sustainable and participatory manner. The project series are funded by the Federal Ministry of Labour and Social Affairs and the European Social Fund (ESF) as part of the *Securing skilled workers: training and promoting equality* program (IG Metall Vorstand, 2017). The subject of qualification is an important factor in the debate on Industry 4.0 and has been strategically implemented on different levels by IG Metall. Not only is the qualification of workers representatives an important topic, but also the qualification and frameworks for the employees. For the first time, the collective agreement in the metal and electricity sector enables more

working time self-determination for 900,000 employees, which can also be used for qualification. In addition to that, the collective agreement on qualification flanks the conditions under which part-time qualification can take place.

Conclusion

As the report shows, the scopes of action in Industry 4.0 are relatively convenient for the union and the workers representatives in Germany, but require qualified stakeholders on both levels. Therefore the topic of qualification plays an important role in the debate in Germany and especially with regard to IG Metall, which established a widespread qualification landscape on all levels. An important factor, especially in the German model, is the enablement of workers representatives as co-creators of the digital transformation on the company level. A successful implementation on the company level might also benefit unions, as it could attract new members for their organization with their approach of innovative participation and co-creation. Another important field of action for the social partners will be the shaping of working time. Employers criticize that the legal regulations leave too little flexibility for the organization of future work. Trade unions, on the other hand, fear infiltration of employee protection. So far, many unions struggle with declining or stagnating memberships and the digital transformation might offer potential to communicate the benefits of union membership. Nevertheless, the union has to deal with a lot of uncertainties, as the consequences of the progressing digitalization are somewhat speculative. Especially with respect to employment development and the possible diversification of forms of employment, the consequences for the union and their assertiveness are unclear. As yet, the union positioned itself as a key player in the debate and shows a high degree of digital readiness.

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