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Possible approaches for European Works Councils to digitalization processes

Making better use of information and consultation rights

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This Working Paper at a Glance
The working paper uses the example of digitalization to showcase how European Works Councils can further develop their participation practices in companies and their various locations. There is both room and need for improvement in organizing decent digital work and in the use of information and consultation rights by European Works Councils. It is possible to resolve the contradiction between what is and what should be when European Works Councils improve their knowledge about digitalization practice with a digitalization checklist and specific questions. Targeted processing and presentation of this knowledge lets them enhance their position in relation to company management.

FORSCHUNGS-
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Content

Executive summary

Two contradictions form the starting point of the project: the discrepancy between the actual practice for organizing digital work in companies, and the possibilities of good organization; and the discrepancy between current use of information and consultation rights by European Works Councils (EWCs) in their relationship with the management and current practice. There is scope and need for improvement in both the organization of digital work and the actual use of information and consultation rights.

1. The project aims to resolve these contradictions in productive tension. EWCs / workers' representatives can generate additional knowledge about digitalization processes in practice by means of a checklist. And they can enhance their position in relation to the management with targeted processing and visualization of this additional knowledge. Knowledge that is inaccessible to the management and the possibility of additional knowledge being generated by the EWC / workers' representatives attract the attention of the management.
2. EWCs / workers' representatives can develop additional knowledge by collecting, evaluating and condensing information, using a structured digitalization checklist for this purpose. The checklist is based on the value of well-organized digital work. To give meaning to this value, the checklist is broken down into the near and far horizon, together with five criteria (C1 to C5):
   - Near horizon (C1 to C3): changes in the area of work and man/machine/organization: C1 technology and work, C2 leadership and cooperation, C3 initial and advanced training.
   - Far horizon (C4 and C5): changes in companies and their contexts: C4 business model, C5 company sites, supply/value/knowledge chains

The real nature of these criteria, in other words the situation prevailing at the sites, is rated using the indicators "good", "less good" and "suboptimal" to describe the organization of digital work.

The practical knowledge of the workforce (which is a so-called observable) is available to the EWC / workers' representatives for gathering information.

The value of decent digital work is based on the VCIO model (value, criteria, indicators, observables).

3. At the same time, the starting point of the project points to incomplete innovation regimes in the companies and their environments. These can be completed by improved cooperation. In terms of digitalization, innovative **products**, processes and practices are generated by integrating the management's top-down strategy and the EWC / workers' representatives' bottom-up strategy. To put it in a formula:

   Innovation =
   Management knowledge + additional knowledge from EWC / workers' representatives and the workforce.

4. Well-**organized** digital work it is an important component in the larger context of improving and completing a company's digital "innovation regime" – in other words, how a company as a whole and its sites deal with digital transformation. In this context, the following are of particular significance:
   - Enhancing the workforce's capabilities as the main source of innovative change to create opportunities for socio-economic progress in the regions by developing and producing new or improved products
   - Recognizing the innovation potential based on the existing capabilities, knowledge and skills – this explicitly includes the production capabilities that make innovative products marketable in the first place
   - Synergy and cooperation of strategically relevant players
   - Fostering an understanding for the mutually complementary heterogeneity of sites

There are empirical studies that describe how information and consultation rights are currently being used. This project attempts to foster more intensive, targeted use of these rights.

It shows possible courses of action for the further development and modernization of EWC participation practice in many companies. Taking digital transformation as an example, it shows how participation potential and practical forms of participation can be developed.

1. The remit and basic concept of the project

The digital transformation is often described as a mega trend alongside globalization or demographic change. It is possible to observe that the digital transformation of society/societies is gaining ground. Companies, state authorities, organizations and citizens are increasingly using digital tools for relationships between people and things. If digitalization options are available, they tend to be used as a rule.

This also applies to the management of a company: communication and work is digitalized in both large companies and small and medium-sized businesses, although to a differing extent and in different ways.

But it is not clear what happens to the work and workforce in the process of digitalization. The characteristics of digital technology do not determine the form which digital work takes. Digital work is not determined by digital technology. It is designed or organized.

Hence, there are good reasons to ask how improvements can be made in cases where digital work is not well designed. There are two things to be said here. If the implementation of digitalization in digital work is suboptimal, there is *scope for improvement.* This is made possible by the "digital substance". But it is also in *need of improvement*. This brings workers' interests into play: the way digital work is organized can be good, less good or suboptimal.

The current situation is contradictory. On the one hand, it is relevant for European Works Councils (EWCs) to ensure or be involved in good organization of digital work; on the other hand, it is common practice for the management not to inform or consult the EWC in good time or to an adequate extent. The EWC's expectations based on its rights are contradicted by what happens in practice. Studies have shown that EWCs are frequently not informed by the management, or not in good time, or not in full (De Spiegelaere / Jagodzinski / Waddington 2022; Melzer 2021).

In a number of European companies, the management fails to abide by the EWC's right to information and consultation that is enshrined in Directive 2009/38/EC of the European Parliament and of the Council of 6 May 2009.

The directive does not provide detailed definitions for information and consultation (cf. Gohde 2004). But they are generally accepted in society. To name but a few examples: the EU Commission, the citizens' portal of the federal state of Baden-Württemberg or VDI Standard 7001 of the Association of German Engineers attribute great significance to good civic participation.

We explored and tested the possibilities of better participation practice for EWCs and workers' representatives in the project "Possible courses of action for the European Works Council at Merck KGaA with regard to digital transformation".

The project group, which included Klaus-W. West, Ulrich Hilpert, Francesco Sandulli, Anja Baumeister and Ernst Gerhards, tried to go beyond merely describing how information and consultation rights are currently being used in a company. Taking digital transformation as an example, the project shows how EWCs / workers' representatives can improve their participation potential and practical forms of participation.

This is a specific form of improvement. It chooses a different path from the approach of imposing fines on a company when the management fails to inform and consult the workers' representatives in an adequate manner.

Basic concept

Two contradictions form the starting point of the project:

- The discrepancy between the actual practice for organizing digital work in companies, and the possibilities of good organization
- The discrepancy between current use of information and consultation rights by EWCs, and the possibilities of good practice.

There is scope and need for improvement in both the organization of digital work, and information and consultation practice, which can be resolved in productive tension.

This objective can be achieved in four steps:

1. The EWC / workers' representatives in a company and its sites can systematically and deliberately improve their knowledge about digitalization processes in practice.
2. The digitalization checklist developed in the project is an important tool for generating productive tension.
3. It can be used to generate additional knowledge. Information can be collected, evaluated and condensed to digitalization know-how.
4. By defining their own position, i.e. with experience-based, well-organized digital work, EWCs / workers' representatives can reinforce their argumentation in communication with the management.

Prerequisite for the strategy

There is an important prerequisite for this strategy: digitalization offers the potential for well-organized digital work. We understand "potential" to mean practical possibilities. Suboptimal implementation of digitalization means that human work is devalued by the "inanimate work" of digital systems and programs.

Well-organized digitalization on the other hand provides scope for further development and improvement of work and employment conditions. Given the potential that digitalization offers for innovation, the innovation regimes in many companies and their environment are currently incomplete. It follows that the innovation regimes can be enhanced by improved cooperation between management and EWC / workers' representatives, generating decent and safe jobs in future.

Whether a company uses the potential of digitalization for well-organized digital work is neither a champagne problem nor a "nice to have". In fact, developing innovative practices and products is a "hard" competition factor.

Accordingly, a company can fail with its digitalization practice if it is unable to meet the challenges of competition, due to lacking knowledge and incompetence in using know-how.

Practical innovation potential

The project has described a way to illustrate the management's incomplete knowledge and to show how additional digitalization knowledge can be generated by the EWC / workers' representatives. The management's top-down strategy and the EWC / workers' representatives' bottom-up strategy can thus be integrated for well-organized digital work. A company and its workforce obtain more complete knowledge about digitalization and increase their practical innovation potential.

To put it in a formula:

Innovation = management knowledge + additional knowledge from the EWC / workers' representatives and the workforce.

2. The near and far horizon of the digitalization checklist

2.1 The risks of digital transformation

This is the starting point: the digital transformation of a company is full of risks and its success cannot be taken for granted. There are basically two reasons why a company can fail (cf. Gawande 2013):

- **A lack of knowledge**, because the company is only provided with fragmentary information about itself and the world and how they both function by science, external consultants ("solution developers") and knowledge generation. The knowledge and interaction of various scientific, technical and organizational players that would be necessary for innovation is lacking.
- **Inability or incompetence** to use knowledge. In this case, the knowledge is available, but scattered and disorganized, and the company cannot use it. This applies above all to things that don't work due to faulty planning and production. Even if a suitable program is available, it is not implemented and used appropriately, or this was not communicated adequately.

Research has produced so much knowledge in recent decades that incompetence is just as worrying today as ignorance. The problem now is that competence is not available in a sufficient degree to ensure correct use of the available knowledge. This leads to the question as to how the digitalization engineers or solution developers were selected and to what extent they offer the right background for complex tasks. Are they prepared for the diverse information and for the integration process?

2.2 Improving the digital knowledge of EWCs and workers' representatives

The risks of a digitalization strategy can be significantly reduced if the EWC / workers' representatives improve their digital knowledge and contribute it in their communication with the management. This also enhances their position as an interlocutor in dialogue with management.

Improving digital knowledge goes beyond developing digital literacy. It is more comprehensive. Developing digital knowledge follows a different method than developing digital literacy. It has less to do with taking part

in a training course, and more with reflecting upon the work experience of the workforce.

In a conversation with the EWC / workers' representatives, the workers reflect on their digitalization experience on the basis of a checklist[1], acting as an additional source of information and making their own contribution to generating additional digitalization knowledge. The workers' experience in certain areas of work and certain workplaces is converted into information and aggregated to build knowledge.

2.3 The checklist as yardstick for well-organized digital work

This method aspires to give meaning to values. Values are translated into practical, effective tools by means of criteria, indicators and observables (VCIO). This method puts problem observation in more precise terms and substantiates it with indicators (cf. Hubig 2016; Hubig/West 2016; AI Ethics Impact Group 2020).

The **value** of competitive justice (cf. Schwengel 1999, p. 186 et seq.) that mediates between the value of competitiveness and the value of justice, contains the potential for reaching a good compromise between management and EWC / workers' representatives. In the work context, we use the term "well-organized digital work" as a more precise expression for competitive justice. Well-organized digital work is a derived second-order value and forms the normative core of the digitalization checklist.

Well-organized digital work is a shared interest between company and EWC / workers' representatives and generates an **intersecting set** of interests. Fostering well-organized digital work is therefore also in the well-understood interest of a company. When EWC / workers' representatives demand that the organization of digital work, production and administration processes gives due consideration to the competence and experience of the workforce, they are striving to achieve a **win-win situation** – this can prove essential when it comes to acceptance by the management.

The potential contained in this intersecting set can be used to translate competitive justice and well-organized digital work into **criteria**. They are applied to different parts of the company. This refers on the one hand to the value-based organization of workplaces, qualifications, new leadership roles, business models and the corporate contexts; on the other

1 A draft version of the checklist can be found in the Annex.

hand, “corporate contexts” include the sites, the knowledge chains, supply chains and value chains.

Indicators make it possible to check whether the organization of digital work is good, less good or suboptimal. They provide information about the reality in parts of the company and at its sites. Their selection and valuation result from the selected values and criteria rather than the actual situation itself.

Observables are sources of information for the additional knowledge of EWC / workers’ representatives. On the one hand, this consisted of a company’s intranet and announcements made by the management; on the other hand, it also featured conversations with the workers about their workplaces – which was the main focus of the project. Examples include those employed in the workshop, transport, warehouse, laboratory, sales force or recruitment of new workers.

2.4 The near and far horizon of the digitalization checklist

Introducing digital technology and tools alongside the organization of digital work in a company is a complex process. We therefore advise the EWC / workers’ representatives to ascertain their context of action in the greatest possible detail. This is made up of many determinants, giving due consideration to the near and the far horizon. Problems occurring on the near horizon can be better conveyed when placed in the context of the far horizon.

One example for practical challenges on the near horizon is handling new software in the laboratory. Including the far horizon in the process allows for an adequate description of the causes and impacts that can result, for instance, from pan-European standardization of the software.

When looking at the EWC / workers’ representatives’ possible courses of action, it is important to reconcile the near and the far horizon. The digitalization checklist has therefore been broken down into two sections that depict the near and the far horizon, as well as five criteria (C1 to C5). This makes it possible to handle the value of well-organized digital work.

The near horizon describes the changes in the field of work and in the relationship between man, machine and organization: C1 “technology/ work”, C2 “leadership and cooperation” and C3 “initial and advanced training”.

The far horizon looks at the changing relationship between company, networks and customers. C4 examines the company’s “business model”, and C5 looks at the “sites with their supply, value and knowledge chains”.

The checklist gives EWC / workers' representatives a tool for gathering practical information about the digitalization processes. In the context of the project, they worked with the project group to conduct interviews with employees about criteria C1 to C3 in terms of their work and workplace. Although these were important aspects, they remained incomplete because they only depicted parts of the company. A more complete picture of digital work emerged when the pilot group worked with them to also analyze the aspects covered by criteria C4 and C5.

2.5 Structured analysis of the near horizon

The near horizon of the digitalization checklist covers the criteria C1 to C3. The EWC / workers' representatives can use these criteria to take a more detailed look at the changes caused by digitalization in the context of "work" at the man/machine/organization interfaces.

- **C1 Technology/work:** How far apart are real possibilities and reality?
- **C2 Executives in middle management:** Can they perform their role as multipliers and integrators?
- **C3 Training:** How much training is offered, and how good is it? How can the training practice be rated?

C1 Technology/work

The checklist lets the EWC / workers' representatives differentiate between cases where the organization of digital work is good, not so good or suboptimal. How far apart are real possibilities and reality?

Work that is well organized is less stressful and more interesting. The workers are able to operate machinery and equipment intuitively, because the focus is on user-friendliness for the operator rather than the technical solution. In economic terms, well-organized digital work can avoid mistakes or damage, thus reducing costs because the company has made investment in technology.

It is all a question of whether the workers have to adapt to machinery and technology, or vice versa. Digital work is well organized when digital technology is adapted to the workforce's working capacity, skills and learning capabilities. It supports them and allows them to be put to better use.

There are scientifically sound analytic criteria for well-organized digital work: "context-sensitivity", "adaptivity" and "complementarity" refer to man/machine interaction, while the criteria "holism" and "dynamic" stand

for an integral work organization. They translate the value of well-organized digital work and put the digitalization processes in more precise terms (cf. Hirsch-Kreisen 2020). This is explained below.

The criteria **context-sensitivity** and **adaptivity** encompass aspects of ergonomically adapting digital systems to specific working conditions and workloads. They are translated in the following questions:

- Are digital systems ergonomically adapted to the workforce's working conditions and workloads?
- Is there targeted, situation-specific and real-time access to digital information in order to safeguard and expand the workers' digitally supported courses of action and decision-making possibilities?
- Is data/information provided for safeguarding smooth workflows, or are system errors a constant cause of stress?
- Is work safe at the man/machine interface?
- Can the machinery be operated intuitively and learnt quickly?
- Are information and assist systems adapted to varying levels of training so that the technology warrants the possibilities for continuous learning and upskilling processes?

Complementarity criterion:

- Which functions are performed by the workers and which by the machine?
- Is there sufficient transparency? Do the workers have control of the system?
- Are the workers afraid that the new production technologies will devalue their skills and that the machines will dictate the work cycles?

The criteria of holism and dynamic point towards a holistic work organization. The **holism** criterion opens up further scope for questions: is the job limited to just carrying out tasks or does it include "dispositive" tasks, in other words, organizing, planning and controlling? Is there an appropriate mixture of more or less demanding tasks that reduces workload?

The **dynamic** criterion asks:

- Is it possible to swap workplaces?
- Does the work organization include possibilities for changing tasks systematically to foster learning processes? This can boost value creation and increase the need for higher skills and further training.
- How are interdisciplinary teams formed?
- Is interdisciplinary communication and cooperation encouraged between various specialized workers?

C2 Middle management

Changes to the interfaces between man/machine/organization also change the tasks between middle management and workers. Middle management can potentially play an important role as multipliers and integrators in digitalization projects.

- Do middle management executives act as digitalization multipliers? Do they have a defensive, hesitant or progressive attitude?
- Progressive: Do they develop cooperative styles? Were they involved in the top management's digitalization plans? Who is responsible for program/organization design?
- Hesitant: Discussions about digital skills in the company or at the sites sometimes seem fashionable, but the objective and direction for staff upskilling remain unclear. A hesitant attitude is rational for middle management who keeps an eye on their area of responsibility.
- Executives with a defensive attitude may possibly face critical questions from their staff ("Why don't we have smartphones like the workers in the other departments?")
- Does the management work with the executives to develop a perspective so that they can take on new tasks and perform new roles?
- Have executives in charge of digitalization projects received training in project/program management? When all is said and done, the expectations made of the new leadership role go beyond the standard skills needed for managerial jobs – dual course of study with a master craftsman's diploma, a bachelor/master's degree, time spent abroad.
- Is there some kind of expectation management so that the executives can clearly formulate what they expect from their workforce?
- In their role as integrators, do the executives manage to create a constructive learning-from-error climate with the workers? Here there is a trend towards increasing skills of the workers in a professional and technical capacity and also in terms of problem-solving skills.
- How do executives deal with this potential of self-organized work? Do they delegate more tasks to the workers? In some cases, interdisciplinary teams are set up, consisting for example of technicians, plant managers, master craftspeople and other competent staff, to elaborate ideas and practical solutions.
- Do executives work based on principles that give staff sufficient discretionary powers in their work, instead of imposing rules?
- Do they foster error tolerance when putting new equipment to the practical test?
- In other cases, a company introduces a matrix organization to "in-source" value creation again. Do workers get more "work on top" from the executives in uncoordinated fashion?

- Some companies try to solve this problem with a project map.
- Would there be any practical sense in introducing an upper limit on the number of projects that have to be handled at the same time?
- Does the matrix organization partly cancel out the content-or function-oriented division of labor?
- Do executives have to take on demanding administrative jobs, such as dealing with travel expenses claims or handling HR issues, that are not part of their remit and for which they are not qualified?
- If the work of executives and staff is extended and upgraded, is this reflected in better pay?

C3 Initial and advanced training

- How is the quality and quantity of training measures rated?
- How is training practice rated?
- We shall begin with recruiting skilled workers. Does a company have enough or not enough skilled workers? This depends on hiring practice and not on regional job markets.
- Which skilled workers are hired? Which qualifications do they have?
- Is there a certain flexibility in handling the hiring of new workers, or do they have to be a precise match for the company's expectations?
- What practical relevance is attributed to the much-discussed process and problem-solving skills that allow workers to identify problems, understand contexts or suggest new or modified workflows? Are there other skills that a company wants to have?
- Has technical English become established as a basic skill?
- The skills question must be discussed in the context of various challenges in the company. What kind of further training is given to the staff when their work is taken over by computers or robots?
- Do workers whose remit has been extended to include customer contact receive adequate training in order to communicate with customers and answer technical questions?
- How do companies meet the new demand for new skills? With new job profiles or with a pragmatic approach?

Some corporations even develop new job profiles such as data scientist for Big Data analytics, sometimes in cooperation with external scientific institutions. Predictive maintenance of production processes facilitated by digital technology demands pattern recognition. Model developers are interdisciplinary specialists who build mathematical models and are responsible for their availability.

Pragmatic advanced training strategies such as task modification and upskilling on demand show the ingenuity of a company when it comes to finding solutions. For example, if the laboratory is transitioning from chemical to biological formulas, the formation of cooperating groups (clusters) of specialists cancels out the distinction between industrial and clerical staff. Staff knowledge and skills are extended and upgraded through synergies.

Then finally, there is the set of questions asking how the current training practice is rated:

- Criteria for good practice include training packages, practical training, controlled user courses, videos instead of written learning materials, clear learning checks, e-learning, on-the-job training or fostering mutual assistance, for instance, younger and older staff helping each other.
- How widespread is good practice?
- How widespread is practice that needs improvement?

Our interim conclusion: Well-organized digital work is not just good for the workforce but is also desirable in the legitimate interest of the company. Digital work organized along lines that are not so good or even suboptimal is not in the interests of the workforce because it contradicts recognition of their working capacity and skills. It is also adverse to the interests of the company because of the increasing labor and manufacturing costs caused by mistakes during production and by accidents.

2.6 Structured analysis of the far horizon

Digital changes on the near horizon belong to the “familiar” aspects or “living environment” of a site, where the changes become visible and tangible Those who want to know what happened before and wish to anticipate what the sites can expect should also consider the far horizon.

Let us take a brief look at the issue of a site’s secure future. This depends to a great extent on the status quo: is a site part of a supply chain with a comparatively low or high share of value creation? Or is a site part of an innovation chain or a research network? We argue that the security of a site increases with growing value creation and expertise. This could, for example, secure competitive advantages for the sites in southern Europe over those in North Africa. We’re talking about the increasing probability but not the absolute security of sites.

Which changes can be observed in the business model and at the sites, in the supply, value and innovation chains and research networks (C4 and C5)? (cf. Hilpert/Sandulli 2025; Hilpert/Sandulli/Schunder 2021).

C4 Business models

The quality of a company's viable business model depends on how production, research, administration, sales and suitable solutions in terms of work culture are integrated. Existing business models are forced to change under the pressure of competition and digital transformation, with digitalization expanding the range of competition models.

- Does the integrative interrelationship of the named factors persist in this case?
- Are the transitions from one business model to another continuous or disruptive?
- Does a company abide by traditional structures and divisions, or does it follow new concepts (such as "smart company", "agility 4.0", "lean production" etc.)?
- Is there a threat to traditional business models based on customer loyalty and vertical integration, such as in the pharmaceutical industry?

The companies are facing irrefutable pressure to act. One of the main driving factors here consists in new competitors who are putting pressure on prices and who, at least in the pharmaceutical industry, are launching new active substances on the market and using other production methods.

Is there central planning of the transition (for instance, with a "master plan for 4.0) or does every division and every site go through its own searching, testing and decision-making processes? Do they result in the standardization of all sites, or can the sites develop their own strategies?

Handling a company's own data and information

- Does a company outsource knowledge and IT to external providers?
- What experience does it have with outsourcing shared services or other less complex final products and labor-intensive stages?

So-called tickets are one example from practice. Staff have to write tickets for the tiniest repairs during maintenance, so that the work can be outsourced to a company. Another example refers to the roll-out of new software for maintenance or warehousing.

- Are the only available consultants English speakers and based on another continent?

- Who writes the programs?
- Who translated the program designs: a person or a computer?
- How familiar are the program designers with the area where the programs will be used?
- Is the software developed in India for instance, in other words, far away from everyday working life at the sites and from the production conditions and the qualification level of skilled workers in Europe?
- Does the workforce have a different cultural understanding of instructions?
- Is (effective) data protection in place?
- Are things transparent enough so that the workers can estimate the consequences of data production?
- Are staff personality rights protected?
- Is there any experience with process errors (for example, in relation to performance reviews and when changing their family status)?

Data mining with Big Data 4.0

What is the transition from Big Data 2.0 to Big Data 4.0 like? With Big Data 2.0, data about the sales of pharmaceutical products was collected at the pharmacists' point of sale or from consumers. With Big Data 4.0, data generation follows a model similar to that used by Google. Epidemiologists make enquiries with this company when they need information about how a particular strain of influenza is spreading. Furthermore, Big Data 2.0 focused on data protection. The focus of Big Data 4.0 is on using data revealed by people's user behavior (cf. Priddat/West 2016).

- Which innovations were created by a company and which by its sites?
- Looking at the pharmaceutical industry: which sweeping changes and which incremental innovations?
- Which new interfaces emerge between companies and networks?
- Are there trends to decentralize production and distribution?

Networking 2.0 led to interaction between science, industrialization, fermentation, chemistry and pharmaceuticals in developing artemisinin for use in the production of drugs for the treatment of malaria and established industrial provision. There were five stakeholders in the USA, Europe and Africa, and one regulatory approval. Decentralized production of artemisinin could be possible with Network 4.0. Scientists and farmers could cooperate using 2000 continuous-flow micro-reactors. However, all 2000 manufacturers would need regulatory approval.

C5 Future of the sites

The Covid-19 pandemic clearly revealed the issue of efficient, resilient production and distribution chains. The global supply chains of precursors and medicines were called into question, together with the whole question of keeping the population supplied. Sporadic site closures were necessary. The following questions have arisen from this experience:

- How do sites and regions take part in global supply chains?
- Which local suppliers and knowledge producers are available?
- What is the strategic position of a site?

The answers can vary greatly from one site to the next. They can be part of supply, value and innovation chains or even research networks. The sites of a company are an expression of special expertise. Cooperation intensity within a cluster depends on the available expertise. Industry-related services make an important contribution to company and site development. This relationship increases to the extent that products become more knowledge-intensive and require more research.

Does digitalization strengthen or weaken the companies and sites? We recommend looking at what happens with their strengths. Among others, strengths include a high level of innovation and investment in R&D, skilled workers and a relatively relaxed workforce situation, good training and research infrastructures in the immediate vicinity of the company cluster, a good public funding environment in the EU and established supply chains with clear communication and reliable quality.

The following questions give an indication of the status quo:

- How many suppliers/supply levels does a site have?
- Do the contributions differ in complexity?
- How large/complex is the workload for vendor management?
- What is the role played by constantly high quality and reliable supply?
- Is the relationship with the suppliers on a stable footing, or have there been frequent changes?
- Which form of cooperation is of practical significance – supply, value and innovation chains, and research networks?
- To what extent were local plants and staff involved in processes and in formulating the orders?

The following questions give a more precise view of changes initiated by digital transformation:

- Does the company/do the sites expect digitalized processes from the suppliers?
- Do the established suppliers have to cope with technological changes?
- Do new suppliers get a chance?

- Does the company want to reduce the number of cooperation partners and suppliers?

2.7 Addendum: The view of software companies

Do companies use digitalization to develop efficient, resilient knowledge, supply and value chains together with contexts conducive to innovation?

In the project, we presumed that EWCs / workers' representatives normally have no direct link to software companies and no information about their strategic orientation. This was reported by solution developers working at the sites. The EWC / workers' representatives had no direct contact with them (cf. Evers/ Krzywdzinski/Pfeiffer 2019).

In addition to the talks with the EWC / workers' representatives at the sites, we therefore conducted interviews with software companies in Madrid about implementing digitalization. Spain's capital city has become an important European software hub. It transpired that the management of companies adopting digitalization plans tended to implement these in any event and regardless of all particularities at the sites. This was detrimental to efficacy and efficiency, also causing all sorts of other problems.

Our explanation for this conduct is that the determining management perspective for digitalization plans is usually defined by technology, without being process-oriented. Digitalization is primarily a cost-cutting tool for companies, disregarding aspects such as innovative organization or the development of new products. The focus is on cutting costs, simply continuing old habits with new digital technology.

But this could change. A large company in Madrid now seems to be expanding its view of digitalization by adding an "engineering hub" to its "technical hub".

3. The practice of generating additional knowledge: Collecting, evaluating and condensing information

Generating “additional knowledge” (cf. Stehr 2003) is crucial for EWCs / workers’ representatives when communicating with management. Additional knowledge that the EWC / workers’ representatives can provide is basically scarce and inaccessible for the management. On the one hand, it is an important source for organizing good digital work; on the other hand, it is increasingly seen as one of the most important sources of economic value creation. Companies tend to complain that public access is blocked by firms and patents; however, they ignore the knowledge available within their own workforce.

EWCs / workers’ representatives generate additional knowledge by gathering and evaluating information and condensing it to digitalization knowledge. The method for this process is presented in the following section.

3.1 Collecting information

Before work on collecting information begins, EWCs / workers’ representatives clarify which sites in Europe are involved. Due to time and material constraints, sites in Germany, France and Spain were chosen for the project. As a result, all German texts had to be translated into French and Spanish.

Consultations were held with the EWC / workers’ representatives at all sites lasting two or more days. The preparations included the provision of three documents following initial communication with the EWC Chair: one two-page text about the objectives of the project, the draft checklist, and instructions for the consultations.

We want to look a closer look at the instructions for the consultations.

“Consultations are held with the members of the EWC and WRs. The intention is to develop a digitalization checklist *with* the members of the EWC / workers’ representatives and not just *for* them. They contribute their observations and experience at selected sites to the talks in Germany, France and Spain. This is not about answering the questions in a questionnaire.

To this end, the members of the EWC / workers' representatives receive a draft checklist in their own language from the project team in good time before the talks. This is the starting point for clarifying the question about the digital specificities of the respective site.

- What is and what isn't applicable?
- What experience is available with digitalization processes?
- Why work with a checklist?

For example, during a surgical procedure in a hospital, a checklist ensures that the hygiene rules are heeded and that the patient is not harmed. The digitalization checklist should help the EWC / workers' representatives to know where the company and its sites stand in the digitalization process. The list is intended to allow more precise observation of digitalization processes.

- Is digitalization proceeding quickly or slowly?
- Is IT being applied to existing processes? How is work changing?
- Do the workers need new skills? If so, which?

The checklist must not be too long or too detailed. It must be easy to handle, and it should be short and precise with a focus on essential aspects.

For the consultations, we need two days of four hours each for every site.

Three remarks about working with the checklist:

- On site: The members of the EWC / workers' representatives use the list for targeted collection of information about digitalization processes in everyday working situations, making their own observations on site, following their usual routines and in talks with the workers at their workplaces. This knowledge can enlarge their influence on the quality of work.
- Preferably, the members of the EWC / workers' representatives should put the checklist to the test in a selective trial run during the project. It is not representative.
- The checklist in the final project workshop: our aim is for there to be an exchange of information between the members of the EWC / workers' representatives at the various sites, using the checklist, sharing initial experience with the trial run, working together to interpret the results and making use of the knowledge gained with the checklist in the EWC."

These instructions and suggestions were put to use in the project. In some cases, they went even further, with workers from the various business units taking part in the consultations for the checklist trial run. In other

cases, the EWC / workers' representatives held the consultations at a different point in time.

The digitalization checklist was used to collect information about experience with digitalization in the workplaces and areas of work. This suggests that EWC / workers' representatives have access to various sources of information: site inspections, official and unofficial information in committees, commissions, supervisory boards, contacts between the sites.

The EWC / workers' representatives can use the checklist with criteria C1 to C5 to analyze a company's publications (e.g. texts, PowerPoint presentations, charts, statistics on the intranet), provided the intranet has a suitable search engine.

With regard to the practical conditions for collecting information, it soon transpired during the project that the working conditions for the EWC / workers' representatives differ greatly from one site to the next. The differences referred above all to the working hours and the extent to which the workers' representatives had access to the workforce during the working hours.

The time available to the EWC / workers' representatives in Germany is not necessarily a generally valid benchmark for the EWC / workers' representatives at sites in France and Spain. This probably also applies to other sites in Europe. In large companies in Germany, the EWC members/workers' representatives are released from their normal work duties, whereas in other places they only have a much smaller amount of time every month for works council activities. In some cases, the monthly time allocation is subject to negotiation between the EWC / workers' representatives and the site management.

There are also great differences in the human and material resources, budgets etc. for the EWC / workers' representatives.

We suggested that the relationship between the EWC / workers' representatives and the workers should be viewed as a network of information sources. This results from the logic of the digitalization checklist. If the knowledge and experience of the workers as a source of information about digitalization practice gains significance, then the size and density of this information network is strategically relevant.

- Which means of communication do the EWC / workers' representatives have to gain access to the workers in the various parts of a site?
- Are there workers' representatives in all parts of the site, or are some excluded?
- If there are no workers' representatives in certain parts, can the EWC / workers' representatives still collect information about what is happening in the area of digitalization in all areas?

3.2 Evaluating information

The digitalization lists completed by the EWC / workers' representatives at the various sites have to be evaluated. Given the large number of tasks involved and the time constraints, an uncomplicated and manageable procedure was necessary here.

In a reflection workshop at the end of the project attended by all EWC members of the participating sites in Germany, France and Spain, the project team and the EWC members evaluated the results of the information collected at five sites and in ten projects. This included reflecting on the work with the digitalization checklist and the actual evaluation of the completed checklists.

Initially, the focus was on the reflections of the EWC / workers' representatives about working with the digitalization checklist. It transpired that the checklist is suitable for analyzing the implementation of digitalization or automation processes and indicates the expected changes in the workforce and in the way of working. But these positive findings also lead to the need for constant updates in line with the changing situations of the EWC.

The EWC members / workers' representatives drew attention to the following points:

- The checklist is suitable for adequate description of the **status quo**, but it does not point out how the processes can be implemented in a way that is suitable for the workers. This needs further reflection, communication and cooperation in the EWC.
- An optimized checklist format could make it easier to analyze the results. The EWC members were not able to say exactly what should be left out or added. However, certain KPIs should permit **continuous monitoring** of the digital transformation.
- Differentiated answers to the consequences of individual digitalization measures could make it easier to use the survey **in all parts** of the company. There was no answer to the question as to which parts need specific things to be added in order to cover the situation appropriately.
- Greater consideration should be given to the **particularities** involved in implementing digitalization or automation processes. Something that is finished quickly in some cases may take longer in others. For example, in some cases it may be beneficial to have qualified staff for the roll-out of digitalization projects, while in others the affected staff should first be trained and then asked to pass their knowledge on.

We will now turn to **the evaluation of information.** During the project, the project team took on the task of evaluating altogether ten checklists. This

provided insights for the future work with the digitalization checklist after the project. Further consideration must be given to qualitative aspects and also to the amount of time involved. This made it all the more important for the evaluation process to be quick and easy to handle.

During the project's final reflection workshop, a method with three-color coding was chosen: green corresponds to good digital practice, amber to mixed and red to poor practice.

Examples for possible topics include the quality of initial and advanced training, autonomy of work, job losses and working in groups. These five topics and three ratings result in a fifteen-field matrix. The matrix of topics and ratings allows for two ways of reading and interpreting:

- On the one hand, as a topic-based comparison between the sites: Which site has which solution for a topic? Which site can serve as an example for others to learn from?
- On the other hand, as a practical indication of the next strategic goals: In this case, a project or area with a topic marked in red can receive improvement suggestions from yellow or green topics. The targets seem realistic and attainable because they have already been achieved in other projects or in other parts of the company.

The results show that the function of generating additional knowledge is manifested by revealing comparison possibilities and by defining practical strategic targets.

We want to supplement these two interpretations with a third function: competence gain. This became clear during the workshop in a fictitious dialogue/role play between a management representative and the works council. An EWC equipped with practical digital knowledge wanted to draw the manager's attention to irrefutable deficits in the digitalization practice in his area and in his line of argumentation. It was obvious that deficient digitalization practice slowed the process down, made the project take longer, reduced efficiency and increased the transaction costs.

3.3 Condensing information

This point of the evaluation process brought the project to its conclusion. The EWC members stated that they would discuss and decide on the future approach after the project.

The EWC / workers' representatives will decide which topics are particularly relevant and important at the moment. They will develop a strategy for solving digitalization problems. Here it is essential for complementary knowledge to be available to close any possible knowledge gaps that

the management may have. They will have to decide which language to use for these topics so that the management can understand.

4. Recommendations: Arguing for an enhanced position of a European Works Council

Generating knowledge with the help of the VCIO method gives EWCs / workers' representatives a chance to make a contribution towards ensuring that the workforce is perceived and recognized as having specific skills and expertise. This sets a counterpoint to viewing the employees as mostly replaceable workers. The aim is for them to be seen as an important component in a company and at a site, and not as an add-on to the machinery and equipment.

It is very important to translate the value of well-organized digital work into criteria and indicators. This value represented by EWCs / workers' representatives is substantiated in communication by criteria and indicators. They make the management's relevance notion and language their own in order to challenge the management. Here it is advisable to use management language, without losing one's own orientation.

The management's top-down strategy should be supplemented with a bottom-up strategy for well-organized digital work from the EWC / workers' representatives, thus harmonizing operational workflows. A one-sided top-down strategy does not satisfy this understanding of digital work. A bottom-up strategy can rectify coordination weaknesses and mistakes.

- The work of the employees should not be limited to just carrying out tasks, but should also include organizing and planning.
- A change in tasks or job rotation should be the aim for the workforce, and work should be expanded in interdisciplinary groups.
- When problems arise with the software and digital tools, support should be available with a knowledge and understanding of different European work cultures.
- Sites should be safeguarded with specific contributions to resilient, efficient supply, value and innovation chains as well as research networks.

Finally, we want to put the strategy for well-organized digital work in the larger context of perfecting digital innovation regimes, and name a few important points:

- Synergy and cooperation of strategic players are necessary
- It is important to recognize innovation potential based on existing capabilities, knowledge and skills.

- There is a need to foster an understanding for the heterogeneity of regions with their respective capabilities and arrangements, together with their individual strategies for innovative transformation.
- Screening the existing industrial competences and drawing a comparison with other countries/regions that use similar competencies for modern products.
- Enhancing the skills and abilities of the workers as the main source of innovative change towards socio-economic development opportunities in the regions.
- Supplementing existing structures with additional knowledge (transfer across regions / from abroad) and synergy with new partners in Europe.

Bibliography

All websites listed below were last visited on October 25, 2024.

AI Ethics Impact Group (2020): From Principles to Practice. An interdisciplinary framework to operationalise AI ethics, Gütersloh: Bertelsmann-Stiftung. www.bertelsmann-stiftung.de/fileadmin/files/BSt/Publikationen/GrauePublikationen/WKIO_2020_final.pdf.

De Spiegelaere, Stan / Jagodzinski, Romuald / Waddington, Jeremy (2022): European Works Councils: contested and still in the making, Brussels: European Trade Union Institute. www.etui.org/sites/default/files/2022-01/European%20Works%20Councils.%20Contested%20and%20still%20in%20the%20making_2022.pdf.

Evers, Maren / Krzywdzinski, Martin / Pfeiffer, Sabine (2019): Wearable Computing im Betrieb gestalten. Rolle und Perspektiven der Lösungsentwickler im Prozess der Arbeitsgestaltung. In: Arbeit. Zeitschrift für Arbeitsforschung, Arbeitsgestaltung und Arbeitspolitik 28(1), p. 3–27. https://doi.org/10.1515/arbeit-2019-0002.

Gawande, Atul (2013): Checklist-Strategie, Munich: btb Verlag.

Gohde, Hellmut (2004): Europäische Betriebsräte. Analyse und Handlungsempfehlungen, Frankfurt am Main: Bund.

Hilpert, Ulrich / Sandulli, Francesco (2025, forthcoming): Incomplete Innovative Arrangements. In: European Planning Studies.

Hilpert, Ulrich / Sandulli, Francesco / Schunder, Torsten (2021): Towards sustainable Integration into European Industrial Development: Diversities of Innovative Transformation, Jena. www.boeckler.de/pdf_fof/104153.pdf.

Hirsch-Kreisen, Hartmut (2020): Zwischen digitaler Utopie und Dystopie. Gute digitale Arbeit gestalten. In: Vassiliadis, Michael / Borgnäs, Kajsa (ed.): Nachhaltige Industriepolitik, Frankfurt am Main: Campus, p. 174–197.

Hubig, Christoph (2016): Indikatorenpolitik. Über konsistentes und kohärentes kommunikatives Handeln von Organisationen und in Unternehmen, Wiesbaden: Chemie-Stiftung Sozialpartner-Akademie.

Hubig, Christoph / West, Klaus-W. (2016): Herausforderung „Soziale Nachhaltigkeit“. Indikatorenpolitik als Element einer Sozialpartnerschaft. In: Enkelmann, Wolf D. / Priddat, Birger (ed.): Was ist? Wirtschaftsphilosophische Erkundigungen. Definitionen, Ansätze, Methoden, Erkenntnisse, Wirkungen. Volume 3, Weimar bei Marburg: Metropolis, p. 255–284.

Melzer, Fabienne (2021): Informationsrechte auch durchsetzen. In: Magazin Mitbestimmung 21(3), p. 26–27. www.boeckler.de/de/magazin-mitbestimmung-2744-33666.htm.

Priddat, Birger / West, Klaus-W. (2016): Digitale Wirtschaft. Mit besonderem Blick auf die chemische Industrie, Wiesbaden: Chemie-Stiftung Sozialpartner-Akademie. www.gbv.de/dms/zbw/868770353.pdf.

Schwengel, Hermann (1999): Globalisierung mit europäischem Gesicht, Berlin: Aufbau.

Stehr, Nico (2003): Wissenspolitik. Die Überwachung des Wissens, Berlin: Suhrkamp.

Annex

This list of topics provides the basis for possible questionnaires and guided interviews, as well as for question settings that can be derived from them.

Area: ... Duration of the interviews: ...
Project title: ...

Changes in technology / work processes (criterion 1)	
Criteria	Indicators
1. Describing the digital change(s)	Please explain the changes observed
1.1 Use/scope of use of technical tools/instruments	Please underline as appropriate: 3D goggles, tablets, smartphones, Microsoft glasses, handheld devices, exoskeletons, predictive maintenance, electronic batch records, others
1.2 Duration of transitions / roll-out of technology	Duration of roll-out (months, years)? Since when?
1.3 Use of robots / (full) automation?	Please underline as appropriate: Robot: Where? Which activity? Full/semi-automation
2. Work processes (Work 4.0)	Please describe and provide examples
2.1 Which tasks will disappear (including stressful/strenuous ones)? Which new ones will be added?	Please provide examples
2.2 Translating digital potential into operational structure and process organization/work of staff Work rhythm Consequences of matrix organization (e.g. processing travel expense claims, number of projects)	Please underline as appropriate: Digital tools and programs make work more/less attractive / the work stays the same. Self-determined/defined by others/interactive Process: The program defines the process / poor match for the actual workflow / no adjustments possible / adapts to the flow of work. Dealing with tasks without having the expertise: yes/no Increasing complexity: yes/no
3. Remote work	
3.1 Is there a clear separation between work / personal life?	Where do employees work? When do employees enjoy their leisure time? When is a work step completed?
3.2 What about work-life balance?	Please underline as appropriate: Regular job: good/medium/poor Shift work: good/medium/poor Part-time work: good/medium/poor Remarks:

3.3 Steering production processes (e.g. equipment)	From home? Discussions with colleagues on site?

Changes in leadership / role of executives (criterion 2)	
Criteria	Indicators
Where does this project come from?	Global/regional project
1. What role do executives play as digitalization multipliers?	Please underline as appropriate: Defensive / hesitant / taking the lead
2. Do executives have a new vision of their role?	Traditional/competence-based/cooperative
3. Flat hierarchies and unofficial leadership structures	Special case / normal situation

Changes in initial / advanced training (criterion 3)	
Criteria	Indicators
1. Recruiting skilled labour	Please underline as appropriate:
1.1 Hiring focus	Enough / not enough skilled labour
1.2 Which skilled workers are hired? Which qualifications do they have?	Please provide information:
1.3 Handling the hiring of new staff (Do they have to be a precise match for the company's expectations?)	Too much / enough / too little Remarks:
2 Future skills / new vocational training profiles	
2.1 Process and problem-solving skills (= identifying problems, understanding contexts, suggesting new/modified workflows)	Are lacking / sufficiently available Remarks:
2.2 Change in tasks and demand-oriented training	Applicable / not applicable Example:
2.3 New job profiles (e.g. "data scientist" for Big Data analytics)	Introduction and increased need for new job profiles
3. What is the current practice in terms of training?	
3.1 Examples of good training practice How widespread are they?	Remarks: Strongly / moderately / not at all
3.2 Examples of training practices in need of improvement How widespread are they?	Remarks: Widely / moderately / not at all

Changes in the business model (criterion 4)	
Criteria	Indicators
1. Transitions	Please underline as appropriate:
1.1 Organizing the transition	Smooth (gradually) / disruptive (big bang)
1.2 Are transitions planned centrally (master plan for 4.0)? Each business area searches / runs tests / decides?	Centrally / on a decentral level Applicable / not applicable
2. Handling the company's own data and information	
2.1 Outsourcing knowledge and IT to external service providers?	Applicable / not applicable / beyond the knowledge of users
2.2 Is data protection in place?	Good/sufficient/insufficient / Beyond the knowledge of users
3. Developing the organizational setup	
3.1 Continuity: maintaining traditional divisions	Applicable / not applicable
3.2 Disruption: orientation towards ... … new mission statements? … customers/services and new business areas? … technological possibilities?	 Applicable / not applicable Applicable / not applicable Applicable / not applicable

Changes in the knowledge, supply and value chains (criterion 5)	
Criteria	Indicators
1. Participation in chains	Please underline as appropriate:
1.1 How do companies and the region participate in global supply chains?	Precursors / filling / digital services / innovation
1.2 Which suppliers and knowledge creators are there?	Regional/national/European/global
2. Software development	
2.1 Who developed the software? According to which specifications?	Corporation / European / globally operating company Based on logic of technology/workflow

2.2 How were potential reorganizations developed, if any?	Internally: by management / with the involvement of staff Externally: by consulting firm / by consulting firm with involvement of staff / a predefined programme was rolled out What problems occurred in the process?
2.3 What changes are there in internal forms of organizing work and supply?	Leaner hierarchies: less contact with colleagues / more issues during the transition / job losses Work intensity increased / work was lighter and more relaxed The program ... resulted in boring routine activities / matches the suppliers' activities / is only partially compatible with the suppliers' program / the language is difficult to understand for some / there are international suppliers with adaptation problems
2.4 What is the role played by price, quality, market and regulations?	The price is key / price is outweighed by quality / even if the price increases, the benefits outweigh the price / enhanced quality offers advantages and a better product Enhanced quality: same quality but at lower costs / has made the product into a new/renewed one The market: demands knowledge-intensive offers / gladly accepts the improvement, but does not ask for it The company: is better positioned on the market / has hardly any equivalent competitors anymore Regulations do not allow the product to be marketed well / suit the product well / must be modernized with the innovations
3. To what extent were the local sites and staff involved in the processes and in formulating the assignments?	Local sites that know our requirements were chosen for the contracts / local sites are not at the cutting edge of development / experts had to be brought in / commissioned from outside the region Staff were closely involved in managing the changes / could hardly contribute their skills and interests / only some areas were consulted Awarding of contracts with the involvement of staff / by the management only based on technical and economic aspects
3.1 What questions, goals, assignments?	The company should: better coordinate processes / save costs / reduce errors / improve working conditions / introduce the site to new tasks / save costs / save human resources Systems should be harmonized with clients and/or suppliers Contracts were awarded to companies familiar with sites and processes: yes / no What expectations were associated with the assigned contract? What happens to my data?

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