



## **Participatory approaches to advising small and medium-sized companies on matters of organisational, personnel and technical development**

Notes on the design of consulting projects of SMEs in the field of digitisation/work 4.0

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## 1. The objective of this paper

This paper is addressed to organisational and personnel consultants who explicitly deal with the topic of digitisation of SMEs.

Since year 2000 North Rhine-Westphalia has been running a programme to support consulting services in developing the potentials of SMEs. It aims on workplace development, skill development by further education and longer-term development of SMEs. The programme is implemented by independent consulting companies. The programme requires a process-oriented and participatory consulting methodology.

Within the framework of its labour policy, since 2016 North Rhine-Westphalia has explicitly used the programme to promote the provision of advice to SMEs on the subject of digitisation.

The digitisation of the economy in Germany will be referred to as the 4th industrial revolution, in short: industry 4.0. The shaping of work in the context of industry 4.0 is called work 4.0.

Digitisation is supposed to be used by SMEs and employees as an opportunity to sustainably secure the competitiveness of companies and the safeguarding of jobs. In the context of new technologies it aims at developing and implementing concrete, tailor-made company solutions with the participation of employees.

In the meantime, initial experience has been gained in working on this topic. This document takes up these experiences, summarises them and describes points of reference for the discussion of this topic. We look into the question of which consulting topics were dealt with in detail and how the respective consultations took place. The document also contains a checklist that can be helpful in identifying technology-oriented questions.

For consultants, the question often arises what specific technical competencies they need in order to become active in the field of digitisation. We are also looking into this question. To put it bluntly: You do not need an academic degree. It can make sense to include manufacturer-neutral expertise on technical issues in the consulting process. The guideline supports you to find competent contact persons.

We wish you a stimulating read.

## 2. Case studies of consultations on digitisation

This section summarises some case studies of consultations in the field of digitisation. The case studies are supposed to show,

- the context in which this topic can become an object of consultation,
- how the topics of technology, organisational and personnel development interact,
- that digitisation can be both the starting point and the result of a consultation,
- and which role consulting firms can play in these consulting processes.

### 2.1 Improved customer service in a hairdressing salon

The managing director of a hairdressing salon asked herself how she could use the current technical possibilities to strengthen customer relations.

Various brainstorming workshops led to the following solutions:

The first measures served to simplify the scheduling, to increase the binding nature of agreed appointments and to support the agreement of subsequent appointments. For this purpose, the website was expanded to include the option of making an online appointment. Since customers were also asked to provide their mobile phone number, a tool was set up that automatically reminds customers of this appointment by SMS one day before the appointment. The system also offers customers the possibility of automatically arranging subsequent appointments after a desired period of time.

Customer information was improved by the help of a digital advertising and information system (shop window advertising, monitors on site). Thus the hairdressing salon can draw attention to current offers.

This also includes a digital photomontage system: customers can view on screen how they will look with different hairstyles and then order one they like best.

The company is technically supported by an external IT service. This service provider was involved in the workshops in order to discuss the technical possibilities and to implement decisions made. In the course of the consultation, responsibilities and processes were changed in such a way that all new offers in everyday working life can be reliably made available to customers. In addition, the responsible employees received detailed instruction in the technology in order to be able to operate it routinely.

Overall, these measures led to a significant increase in customer loyalty and customer satisfaction.

### 2.2 Owner-led manufacturer of circular saws

A family business with approx. 30 employees is the market leader in the production of circular construction saws. In the past, inventories had risen continuously so that storage space became scarce. The company wanted to commission a consulting firm to support the planning and construction of a new warehouse. The consultant refused to carry out this assignment. Instead, the consultant proposed to the company to introduce a kanban-based storage

system. Since then, the individual inventories no longer have any fixed locations. Storage bins are assigned on a case-by-case basis as required. This made better use of space possible; the overall space requirements decreased. For the implementation of this storage system all parts were provided with barcodes so that with the help of barcode scanners and the corresponding storage software it is possible to find all parts quickly at any time.

In a second step, changes were made in production. The "One Piece Flow principle" was introduced for a new saw, which means that the employee accompanies "his" saw through the various assembly stations. This form of manufacturing became possible after the company introduced an ERP system that was adapted to the needs of a small company. This is a computer-supported comprehensive organisational planning system, in which material requirements planning act as one of the most important parts in the manufacturing industry. The ERP system, developed especially for smaller companies, ranges from master data management (articles, parts lists) to scheduling (in-house production, purchasing, assembly), production control (order initiation, order monitoring) and costing. The program also includes Customer Relationship Management (CRM), which professionalises communication with customers. The ERP system is not that powerful that it has to be constantly fed with hundreds of data but it is flexible enough so that specific wishes can be easily implemented. The scanning system of warehousing could be easily integrated.

In terms of methodology, the consultant primarily focused on involving employees in the process right from the start. They were always asked for their opinions when it came to rebuilding and reallocating warehouses or changing production. It became clear that the entire reorganisation was not created by bureaucratic decisions which did not take into account the real situation, but in cooperation with the practitioners. The consultant is convinced that newly introduced systems that are not accepted by employees and that are not lived are doomed to failure.

The necessary training courses were conducted on the job for the employees, supported by handouts and brief meetings with the consultants in the direct working environment.

All in all, after the consultancy process the company now offers a wide range of saw variants.

Thus, carpentry circular saws and variants of other saws have maintained sales despite the collapse of some markets – and all that with the same number of employees. The company has also been able to increase its attractiveness for its customers by for example being able to implement individual wishes without delay, i.e. to supply „made-to-measure suits“ instead of „off-the-peg models“. Assembly times have been reduced by up to 50 percent depending on the machine type, throughput times in final assembly have been halved and inventories have been reduced to around 70 percent – all this with an improvement in production flexibility and the same number of employees. In addition, the middle management level was relieved.

The involvement of the workforce in the change process was reflected in an improved employee motivation. This effect was reinforced by the high transparency that prevails throughout the entire production process now. This also applies to the employees in sales and dispatch, who receive feedback from production at all times as to when which machine is completed and therefore can also provide the customer with faster feedback now.

The example shows that in times of digitisation it is not always necessary to introduce RFID chips and robots. The goal is rather to select and implement technical systems according to the operational requirements. The entire reorganisation was a step towards Industry 4.0 – but one with a sense of proportion. The much-cited destruction of jobs through digitisation has not taken place.

### **2.3 Manufacturer of metal door frames**

A traditional family business with approx. 40 employees produces standard and special frames for the domestic and Western European area at its rural location. The company invested in a state-of-the-art ERP-controlled production line to counteract the scarcity of skilled workers at the site. Design data are read automatically; special designs can also be produced in small quantities. Special software makes it possible to significantly reduce the waste of raw material.

However the new production line alone was not able to improve the production process. Good work organisation, completion on time and high productivity and motivation of employees are not automatically purchased with a modern machine; but the human factor plays an important role even at the age of industry 4.0 and at state-of-the-art production lines.

The manufacturer trained the employees in the technology. The subsequent consulting not only aimed to improve productivity, quality and adherence to schedules, but above all it was important to make the relevant key figures transparent and to integrate the employees into the process in such a way that they could orientate their work on these figures. This topic was repeatedly addressed in workshops. The meetings often took place on a small scale. The flow of information was ensured by regular meetings with the foremen, who then passed the information to the employees in their daily work.

The automation of the numerous work steps did no cost jobs, as is it often feared when Industry 4.0 is introduced. On the contrary: the machine produces higher quantities than before. Cutting, edging, sawing, punching – these are the steps that the production line performs. What follows, for example the installation of the lock cases or anchors, is still manual work, whereby each employee must operate three to four machines or control work processes. The parts are then welded together by a welding robot, which is also controlled by the ERP system. This process reduces the error rate even further. The same applies to the warehouse. In the past, one person was able to do the work there; today two people are required full-time. Thanks to the good quality of the products and the high reliability of the machine, the order situation remained stable and jobs could be secured.

At the beginning some of the employees were afraid to lose their job when the new machine was introduced. But these fears were quickly dispelled. The company now employs four people more than before the machine was purchased and it is still desperately looking for qualified employees.

The qualification requirements on employees have increased. Almost every workstation in the metal industry today is, at least in part, a PC workstation. However due to the widespread use of privately used computers the inhibition threshold for dealing with computers and software is much lower today than it was years ago.

The involvement of employees and the creation of transparency were essential to the successful introduction of the new technology. The management consultancy analysed the situation of the company together with the management and all employees. Simple, pragmatic solutions were found, but they had an enormous impact, such as less scrap.

Everyone felt that the new organisation was advantageous to them. The foremen in particular convey this spirit to the workforce. Today, production runs more quietly and output is higher. The work peaks can be levelled better than before and less overtime is required overall. Sales increased by 15 %. At the same time, the number of employees grew by 10 %.

Investing in new technology is only one side of the coin. The other is the investment in the organisation as well as in the qualification and motivation of the employees.

## **2.4 Digital revolution in an advertising agency**

An advertising agency with nine employees that had been in existence for 20 years realised 80 % of its turnover by the design of print products. In addition, it was highly dependent on one central customer. After a workshop with an external consultant, the management decided to focus more on online media and to diversify the clientele of the agency.

Consulting focused on the areas of work organisation and personnel development. Responsibilities and work processes were examined and the skills and potential of employees analysed. An analysis of strengths and weaknesses was conducted in workshops, individual discussions were followed by further consulting steps: Solutions and goals were formulated in cooperation with the team; measures were recorded in an action plan and implemented in operational practice. The consultation itself was finally checked in a team workshop whether it had fulfilled the expectations and could also be helpful in the future.

The first step in the implementation process was to make the agency itself fit for the digital media. To achieve this, employees had to realise that websites, online shops, social media channels or image films for customers could not be produced by the old concepts and workflows of the print era. The managing director declared the internal change to be a management issue. The manager herself trained as an Online Marketing Manager with a certificate from the Chamber of Commerce.

The employees also had to cope with the radical digital changes. They had to tie new knowledge to old skills. It was no longer about the impressive presentation projected onto a screen in the fully occupied conference room. Rather, „mobile first“ means finding digital solutions for customer requirements that must already have an effect on the screen of a mobile phone. The agency developed an advanced training program which was partly internet-based in the form of Webinars. Furthermore it assigned advisers for in-house seminars, who inform about search machine optimization in the Internet (SEO) or affiliate marketing as cooperative selling model. The agency set up a kind of internal academy to ensure that knowledge from further training remained available to everyone. Since then, knowledge has been stored in chats or the „I Lounge“, know-how has been exchanged, problems discussed and solutions developed. With these new communication channels, the exchange could also take place without meetings. Incidentally, the agency has also opened up these modern forms of cooperation on platforms for their customers who can access the designs of their Internet presence via navigation software.

The internal responsibilities were changed in the course of the consultation: The managing director became responsible for the acquisition of new customers and concentrated in particular on medium-sized companies in the manufacturing industry.

Since then, employees have had greater responsibility. Depending on the assignment and task, the agency forms competence teams (digital units) that work independently. The results are presented to the managing director. The second managing director focuses on financial and structural planning issues.

At the same time, the advertising agency changed its online presence. The own website can be the door opener for orders in the digital area. The own modernisation also facilitated the understanding for customers who still want to change their online communication. If a company's decision-maker likes an advertising agency's website, he is more willing to implement his online ideas with it. Thus the self-marketing tasks were preliminary stages for the focused acquisition of new customers. The agency also expanded its presence on the Internet by blogs and newsletters, intensified its use of social networks and increasingly relied on online tools such as Google AdWords or Xing, a platform for business contacts, to attract new customers.

In the meantime, the market situation of the agency has changed considerably. While at the beginning of the process 80 % of sales were generated with print products and 20 % with online services, the ratio has completely reversed today.

The agency did not see employee fluctuation. This may also be due to the transparent change process initiated by the management consultancy. At a certain point, the agency decided not to increase the number of employees. Since a small agency cannot always provide the complete know-how, it relies on freelancers who are highly specialised and therefore experts. In a sector that always wants to appear modern and young at the same time, the agency focuses on continuity within its own company. It convinces with the traditional virtues of strategic consulting and the newly acquired competences in the digital sector. Nine new clients were acquired in the course of the consultation. In order to regularly check the course steered, the advertising agency remains in contact with its consultant.

## **2.5 Leadership 4.0 in a Software Company**

A software company with approx. 30 employees has been developing special software for approx. 30 regular customers for 20 years. The team consists of mathematicians – mostly the older team members – and programmers. It is characterised by a high level of technical knowledge in the subject matter with which the software is concerned. They built up this special knowledge over the years. The company strives to bind its employees to the company. This explains the long period of employment of up to 20 years which is quite unusual in this industry. In this context, it is almost self-evident that the company itself provides training for that specialist knowledge cannot be acquired at any university.

The new technologies allow flexible and location-independent work. This gives employees freedom to organise their work. The company has a core time from 10 am to 2 pm. Furthermore, the employees are flexible, also with regard to the place of work. The telephone system makes it possible to forward customer calls to any location; the IT system also provides the familiar working environment for the home office.

This flexibility posed new challenges for the management. The organically grown structures were not suitable for managing the company. A publicly funded consultation was used for the reorganisation of the team. The company management already changed the work organisation in advance by reorganising operating areas and reassigning employees. At the same time, the quality management was optimised and ticket system software introduced to improve internal work processes. The consultant involved noted that there had previously been no agreement within the company on what was meant by leadership.

At the beginning of the consultation, the composition of the new management team had to be clarified. The first step was to define who should lead the individual departments and what tasks and contents are associated with these positions.

Then the consultant invited these people to management workshops. Among other things, the following questions were discussed: What values do we want to represent as managers? What is our attitude towards our employees? How can I delegate reasonably? A simple command culture as in a production company does not work in the long run in a company with highly qualified employees that one would like to bind to the company. The strengths and weaknesses of each individual were worked out every three weeks in eight half-day workshops. In addition, organisational and management methods were developed in line with the flexible organisation of work. For example, if four to five people are involved in developing a specific functionality – the module manager develops the concept, the programmer implements it, the quality assurance manager tests the new development, the documentation is adapted, the customer service delivers and installs it at the customer – the separate work orders are always directed at specific people.

Even the most modern means of communication cannot replace meetings. To this end, the company set up a „think bar“: Employees can meet for discussions in a bright room with a large high table with colourful bar stools and in which there are various possibilities to visualise thoughts, designs, etc., including a huge magnetic wall. In addition to the management meetings, the teams organise team meetings independently, sometimes at quite different timescales. In addition, the managing director regularly meets the individual team leaders separately every 14 days. This turned out to be more effective than group discussions in which all team leaders participate. A 100 % presence is no longer necessary due to the communication techniques available today, but it must be ensured that the complete team meets regularly. Conversely, a team gets into difficulties if the manager is rarely present. Real teamwork only works if there is enough common presence.

Personal contact is also crucial to the employees' loyalty to the company. The commitment to a company can only be achieved by people, not by factual issues. Leadership 4.0 does not only mean offering young specialists flexible working hours and good opportunities for reconciling family and career, it also involves personal approach at eye level and a relaxed working atmosphere.

In the course of the consultation, the company developed a new organisational structure and a new understanding of management, which led to more stable processes and a greater job satisfaction. As a result of the consultation process, the team strengthened and the corporate culture improved; and management worked together more closely.

### 3. Topics and approaches in advising SMEs on digitisation

In this section we try to summarise the case studies and derive initial findings that can be transferred to other practical applications. We look into the following questions:

- In which contexts do digitisation issues occur?
- What are the starting points for advice?
- What is the interaction of technology, organisational and personnel development?

The technical system is not isolated in the company and thus can never be considered as a separate part in consultation. All case studies discussed above show that for a sustainable development of a company it is always necessary to look at and work on other areas of the company as well.

The investment in a new technology can form the starting point of a consulting process as in the case of the door frame manufacturer. To develop and utilise the new technology, the work organisations in particular were improved and the production process was made transparent for employees.

In other cases, the initial question is how to improve the work organisation. In the case of the manufacturing of circular saw, the requirements for the technology (storage software, barcode scanner, adapted ERP system) were derived from the definition of the operational problem. In a second step, the corresponding investment decisions were made and implemented.

In both cases, investment in new technologies primarily helped to improve internal processes. The example of the hairdressing salon stands for the use of technology, which serves to improve customer relations essentially.

The example of the advertising agency showed that new technologies can be used in many ways: for internal learning, for improving internal processes, for improving customer approach and for developing new products and services.

Finally the example of the software company shows that the use of greater temporal and spatial flexibility in the design of one's own work requires new management and organisational models. These models must be developed jointly and specifically for the company.

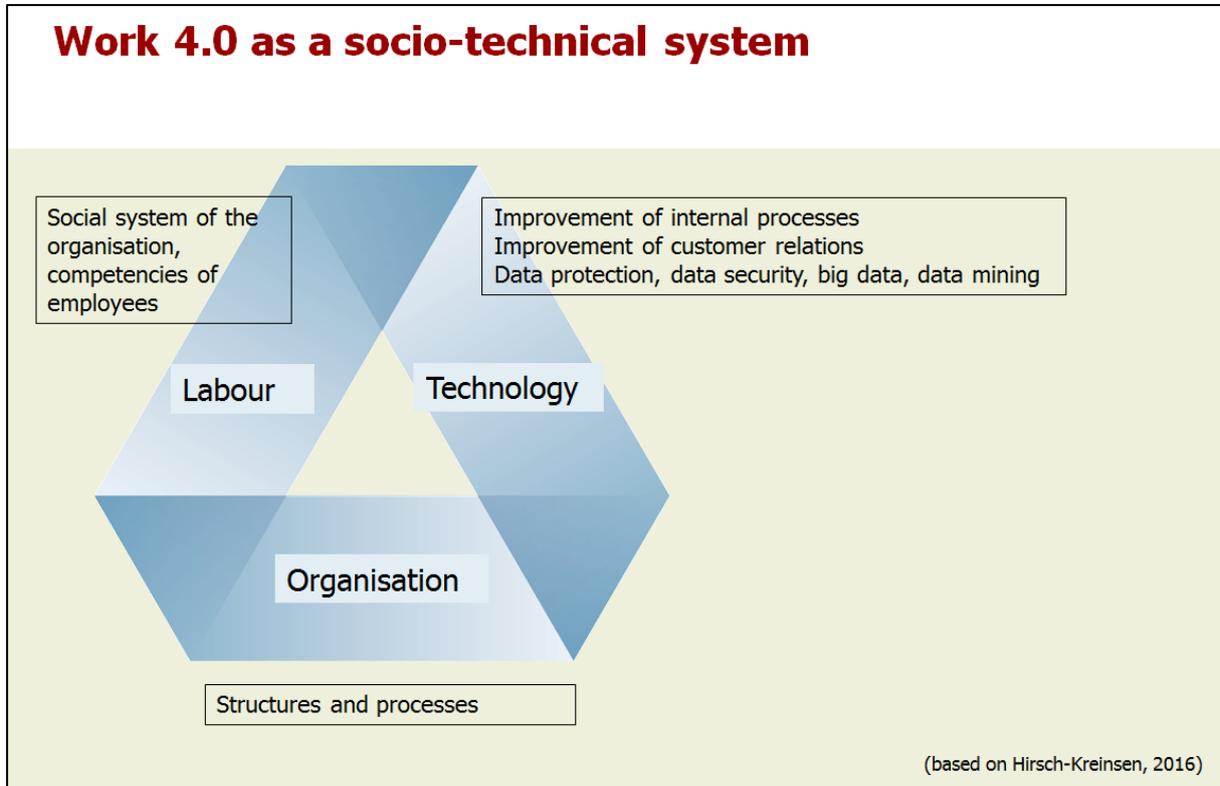
Looking at the other topics dealt with in the consulting project on digitisation, it becomes clear that the topics of work organisation and competence development have always been considered as well.

Structures and processes were discussed and changed in the topic area of organisation. The topic of competence development looks at the employees, the further development of their competences and the further development of their personal responsibility and thus at the social dimension of the company. The changes in the technical system were the trigger or the result of a holistic development process.

The examples show that the topics of organisation, technology and competence development were dealt with in very different sequences. It is important that it is not one of the thematic areas considered in isolation, but that they are considered and developed in their interaction.

In this respect, the handling of the interfaces between those systems has to be considered carefully.

The following chart illustrates the connection:



The following collection of statements may be helpful in identifying digitisation issues that are relevant for the company receiving consultation:

Statement	need for action
<p><b>1. Possibilities of digital technologies for our company</b></p> <p>We know the possibilities that digital technologies offer our company. However, we also know the risks that may be associated with this and take into account the requirements for the qualification of employees and the adjustment of operational processes.</p>	
<p><b>2. Strategy</b></p> <p>We are aware that the new technologies can affect and change all areas of our company. We use them for our external strategy (opening up new markets) and internal strategy (organisation, processes).</p>	
<p><b>3. Planning the introduction of new technologies</b></p> <p>We carefully plan in what steps and how digital technologies can be integrated into our work processes in order to achieve our strategic goals. In doing so, we make sure that the systems are introduced and work productively and in a people-oriented manner.</p>	
<p><b>4. Handling of data</b></p> <p>When purchasing and integrating digital technologies, we take into account data security, the protection of personal data and data quality. This enables us to work smoothly, promote the acceptance of managers and employees and design reliable processes with the autonomous systems.</p>	
<p><b>5. Sourcing of digital technologies</b></p> <p>We developed specific selection criteria for the sourcing of the planned digital technology. Our purchasers know these criteria, apply them and take into account the experience of managers and employees.</p>	
<p><b>6. Introduction of digitisation processes</b></p> <p>We introduce the new systems in our company in such a way that they enable productive and reliable processes and that the work is designed in a humane manner. The handling of personal data is regulated. Managers and employees know the criteria according to which the autonomous systems decide and learn.</p>	
<p><b>7. Designing digitised work</b></p> <p>We use digital technologies to design our work. In doing so, we continuously focus on improvements in the operational value-added process as well as on a safe and healthy work design.</p>	

Based on Cernavin, O.; Ebert, B. (in press)

## 4. Consulting skills required in the subject area digitisation

How do consultants proceed methodically within the scope of consulting in the field of digitisation of work? Well, not unlike they do concerning other topics.

In the case of the hairdresser's salon, the theme 'Use of technology to increase customer benefit' was set by the company. As in most of the subsequent examples, the methodical approach of consulting was the moderation of workshops with different participants. In order to discuss the possibilities of different technologies, the company's external IT service provider was involved in the workshops on a case-by-case basis. On the initiative of the management consultancy, responsibilities and processes were revised in such a way that the operation of the technology could be integrated well into everyday working life.

In the case of the circular saw manufacturer, the consulting contract was to accompany the construction of a new warehouse. Significant changes were made during the consulting process. Instead of setting up a new warehouse, the use of modern storage software significantly reduced stock levels. Due to the good cooperation between the company and the consultancy, a second consulting contract was signed with the aim of modernising the production processes. Methodically, workshops took place in different constellations. In this case it was an advantage that the consultancy was proficient in the business and could give recommendations for software selection as well as for modern production methods. However, from both the company's and the consultancy's point of view, the key to the successful implementation of the consultations was the consistent involvement of the employees and the creation of transparency regarding the goals and the degree of implementation concerning the planned changes. The organisation of training-on-the-job measures also contributed to the success of the project.

Transparency was also the key to success regarding the door frame manufacturer project. This was ensured with the help of key figures. In workshops with the employees, the individual production steps were examined with the help of key figures to determine how they could be optimised. Their proposals for changes were derived. The common understanding of the production process has increased significantly. Overall, work is much calmer. At the same time, the work became more technically demanding. The consultancy supported the company in purchasing tailor-made further training measures.

Another complex project was the renewal of the advertising agency. The methodology used was again essentially that of the workshop. The personnel composition the topics and objectives as well as the follow-up activities that derived from them varied in each case. In a strategy workshop with the management it was initially decided to realign the advertising agency strategically and to shift the focus from print to online media. This was followed by a phase of organisational learning: management and employees became fit in the application of current techniques. Various forms of learning were developed (see case presentation above). The management consultancy accompanied this process. In further workshops, new responsibilities and processes were agreed. The newly acquired knowledge was used for the agency's online presence. This served as a basis for the successful acquisition of new customers for new media. The management consultancy accompanied this process with individual discussions and workshops. The consultant's knowledge of the industry was also helpful here.

As in the case of the door frame manufacturer, the available technology was the driver for organisational changes in the case of the software company. However, the topics dealt with differed considerably. Here, the introduction of a middle management level and the elaboration of a common understanding of leadership were the focus of the consultation. The core of the methodology used was also the discussion and workshop.

The examples show that consulting in the field of digitisation does not require an engineering degree, but a holistic understanding of organisations. The extension of the consulting approach to include digitisation makes it necessary for consultants to broaden their perspective and to take the technical system of the organisation into consideration. Consultants do not have to be experts in the technology used in the company being consulted, but they must direct the discussion with the company management and employees on this topic when advising on the subject of digitisation. To this end, the technical experts of the company being consulted must be involved in the discussion. The consultant must be able to moderate a discussion process on technical issues

Of course, it can be very helpful for the consulting process if the consultant has explicit technical know-how. This was shown, among other things, in the case study of the construction circular saw manufacturer and in the advertising agency. However, technical knowledge alone is not enough in any case. For consulting in the field of digitisation organisational and personnel development is just as indispensable as the ability to control participation-oriented consulting processes.

It may also be considered to combine process-oriented organisational and personnel development consulting with a technology-oriented consulting approach in the context of potential consulting in order to provide all necessary consulting competencies for the company.

However, questions regarding technology selection should be dealt with in a manufacturer-neutral and manufacturer-independent manner. If specific technical questions arise in the course of consulting, it is unfortunate if these are subsequently answered by sales engineers who primarily emphasize the diverse capabilities of their respective systems. From the companies' point of view, however, technical solutions are sought which correspond to the companies' current and future needs. These two perspectives can lead to very different investment decisions. In this respect, a consultation is desirable that prepares the investment decision, implements the technology in the organisation and plans the necessary training and further education together with the employees. Here, too, cooperation between labour policy advisors and manufacturer-independent technology consultants could make sense. Contact persons here are for example technology or innovation scouts who are located at universities and universities of applied sciences, some business development agencies or chambers of commerce. Digital hubs and other technology-related publicly funded service facilities and structures may also be able to support this.

## 5. Digitisation in process- and participation-oriented consulting projects – a learning process for all involved

The introduction and further development of the topic of digitisation/work 4.0 within process- and participation-oriented consulting approaches is an ongoing process in which G.I.B. also sees itself as a learner. In this respect, this guide should be understood as a preliminary document which should be followed up if necessary. We will monitor further developments and look forward to your feedback.

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