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Connected Work Study 2023

How the new paradigm is changing the manufacturing industry

Preface

Come to stay - Connected Work is establishing on the shopfloor

For some time now, the manufacturing industry has been undergoing a transformation. The ubiquitous hyperconnectivity between people and mobile apps, wearables & co. is increasingly reaching frontline employees in manufacturing companies. Under the buzzword "Connected Work," they too are expected to benefit from full digital connectivity with their work environment. But as always when a new paradigm emerges and disrupts the traditional, it takes time and courage to change.

At the moment, it seems as if the industry already has one foot in the new, while the other is still stuck in the old. After all, digital tools are still competing with mountains of paper in many companies, and inefficient, costly media disruptions are the order of the day.

With the Connected Work Study 2023, we would like to shed some more light on the topic of "Connected Work in production" and assess the extent to which this impression is true. In our survey, we raised the question of where the industry in the German-speaking region currently is, and at the same time wanted to know what it has planned for the future and how it is specifically proceeding with the implementation of Connected Work. Our study participants, who took part in the survey in November 2022, are 175 production specialists from the DACH region. In the following pages you can read about the results of our informative survey, which also had one or two surprises in store for us.

For me, it is particularly exciting to see how Connected Work is increasingly establishing itself as a strategic initiative at companies. While the focus at the beginning of Industry 4.0 was on the integration of machines and digital businessmodels, it is now increasingly shifting onto the workers and employees. I am particularly pleased that the efforts toward Connected Work sometimes go so far that some companies already have a Connected Work specialist and many others have launched concrete initiatives of different kind.

For Connected Work to succeed in the long term, it is important to be constantly open and curious about the changes that it will bring. Only in this way can we all reap the maximum benefit from the numerous possibilities and opportunities that the manufacturing industry will be presented with.

I hope you enjoy reading!

Yours, Benjamin Brockmann
CEO and Co-Founder of Operations1

Executive Summary

These are the 4 key insights of the Connected Work study at a glance:

1. Connected Work is not yet an established mass phenomenon, but about 70% of participants see it as a future field and 21% have already created a specialized role for it in their company.

2. The field of activity of operational employees will change significantly in the next 20 years: From standard to non-standard activities. At the same time, this will entail a rethinking of how employees can be supported digitally in the best possible way in the future.

3. In the target picture, study participants see mobile apps as leading technologies for empowering employees. According to the respondents, the greatest potential of Connected Work lies in productivity increases, easier document creation and updating, securing process knowledge, and shortening response times for problem resolution.

4. When implementing Connected Work, it is essential to take a systematic approach that involves operational employees in a far-sighted manner. The key success factor here is good communication.

Content

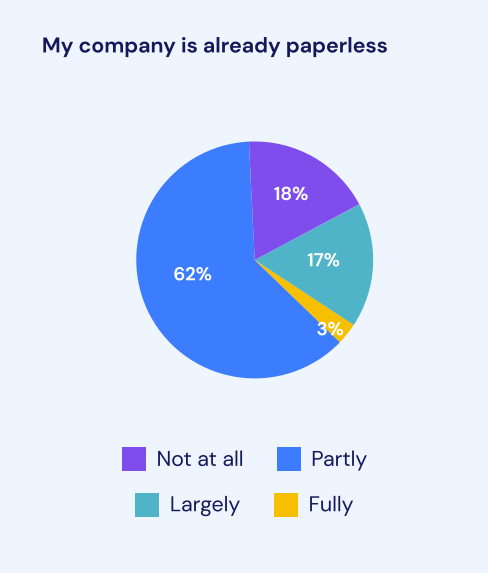
The status quo

Connected Work is gaining importance, but is not yet mainstream

The status quo in the DACH region: only 3% of the companies surveyed have worked paperless to date

Paper has played a central role in the production environment since the beginning of industrialization: from the provision of order papers to the safeguarding of process knowledge to the documentation of quality findings - the carrier medium of any information has always been paper. And even more than 10 years after the term "Industry 4.0" was defined, it is still increasingly in use.

Although there is much more to the concept of Connected Work than the pure digitization of paper documents, the responses of the respondents show that Connected Work is becoming increasingly important, but is still far from being a mass phenomenon: So far, only 3% of the companies surveyed state that they work completely paperless, while 18% work exclusively with paper-based processes. 17% describe themselves as largely paperless and 62% are partially paperless.



What is Connected Work?

For a long time, operational employees in production, logistics and other production-related support processes were neglected when it came to digitization. In recent years, however, there has been a growing trend to also equip so-called "deskless" employees with digital technologies and to better connect them within the organization. This digital, seamless integration of operational employees into corporate processes is referred to as Connected Work.

Market research firm Gartner describes the activities associated with Connected Work as follows: "Connected Workers use various digital tools and data management techniques to enhance and integrate their interactions with the physical and virtual environment while improving decision accuracy, increasing knowledge, and reducing variation."

Reading tip for a deeper understanding: our blog post on the 7 key aspects of a Connected Worker Platform.

The consequences of paper-based work: increased effort, process risks & increased response times

Although the majority of respondents still work in a paper-based manner, there is a consensus that paper seems like a relic that is no longer up to date in the age of digitization. Thus, the study participants associate a number of operational challenges with paper-based ways of working. The 3 biggest problems are the time-consuming creation and updating of documents (44%), data procurement, interpretation effort and archiving (34%), and non-value-added activities such as manual data transfer (29%).

At the same time, it is clear from the responses that the spectrum of challenges is very broad and relatively evenly distributed. This shows that the entire process chain is affected by paper-based production processes - from the provision and training of knowledge, through the execution of activities, to the documentation and evaluation of information.

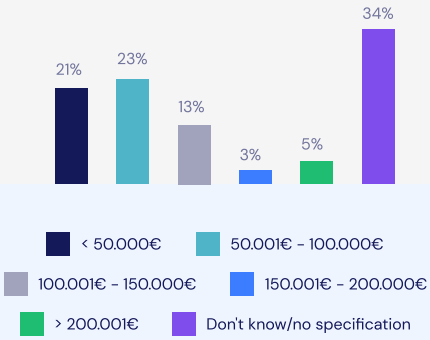
If you still have paper-based production processes, what are the 3 biggest challenges from this?

Paper-based processes: an (uncertain) cost

One reason to say goodbye to paper as quickly as possible and invest in digital processes is, of course, the associated savings potential. It is all the more interesting that when asked about the specific costs associated with paper-based processes, more than a third of respondents (34%) found no answer. Apparently, current challenges are seen, but the exact quantification of the associated costs is difficult.

The most frequent response (23%) from the study participants is an estimate of costs in the high five-digit range per site for paper-based processes. 5% even estimate this at over €200,000 per year.

If you still have paper-based production processes, how high do you estimate the resulting costs per year at your site?



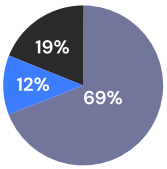
Stefan Philipp
Head of Solutions, Operations1

The misleading idea behind paper costs

"Companies often see creation effort and paper costs as key reasons for moving towards Connected Work," says Stefan Philipp, Head of Solutions at Operations1. "As soon as we talk to them in more depth, it quickly becomes clear that there are far more opportunities than simply getting rid of paper. That's because intuitive, seamless processes can quickly identify six- to seven-figure savings potential on the shopfloor."

Learn more in the interview.

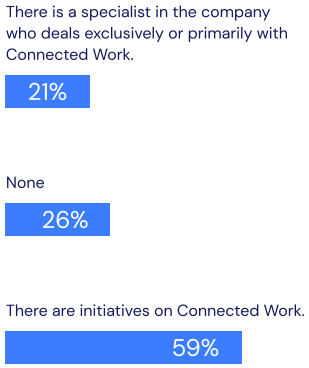
Do you see Connected Work as a future field ?



69% see Connected Work as a future field

The answer to the question of whether Connected Work is seen as a future field shows that companies clearly want to take the step toward networked work despite paper-based work processes. Not only do the majority of the study participants share this assessment. The companies have even gone further than simply identifying a promising approach for the future. Some are already taking concrete measures: Initiatives are already being driven forward at 59% of the participants, and 21% of the respondents even state that they have a Connected Work officer dedicated specifically to this topic. However, the opinion is not entirely uniform, as 26% of the participants do not yet see any initiatives in the area of Connected Work in their company.

What importance does Connected Work currently have in your company?

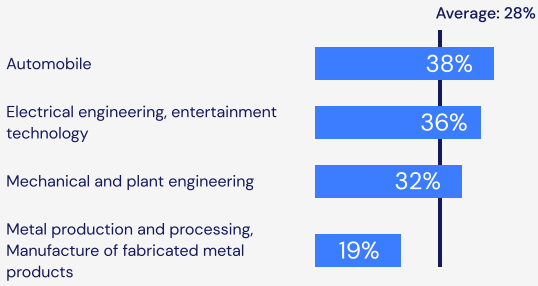


28% consider themselves leaders in the implementation of Connected Work

Interestingly, 28% of respondents attribute a "leading role" in Connected Work to themselves. However, this perception varies between industries: Automotive (38%), electrical engineering (36%) – as well as mechanical and plant engineering (32%) – are the pioneers, while metalworking is comparatively behind (19%).

From the feedback, it can be concluded that an exchange of experience with the pioneer industries can be helpful, especially for user companies from other sectors, when it comes to their own implementation of Connected Work – even if use cases and technologies may differ.

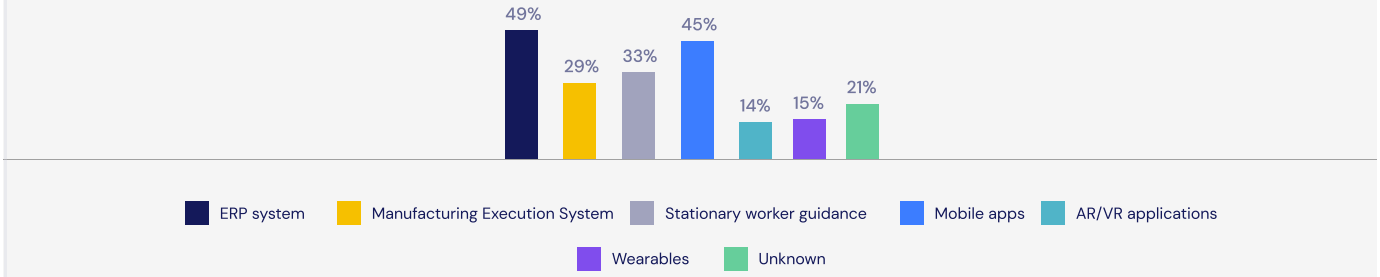
Do you consider yourself a leader in the implementation of Connected Work?



What digital technology is already being used on the shopfloor today?

If the aspirations in the direction of Connected Work are so clear, the question naturally arises as to which technologies are already in use. It turns out that a number of digital helpers are already being actively used on the shopfloor to support operational employees, first and foremost ERP systems (49%) and mobile apps (45%). AR and VR applications (14%) and wearables (15%) are used comparatively little.

What technologies do you already have in place to support operational staff?



Why ERP systems will lose relevance to Connected Work in the future

It is not surprising that ERP systems are currently still at the forefront in supporting operational staff, as they are the central control points for a wide range of company processes. The problem with this software system, however, is that they cannot cover the so-called "last mile to the worker", i.e. the information path from the ERP to the maintenance engineer, inspector and fitter. This can only be achieved through the digitization of employee-led processes by means of Connected Work. Because as a result of employee networking, the formerly analog process is transferred to the digital world, so that the digitization gap can be closed.

Learn more in our whitepaper Operational Excellence on the Shopfloor: Why connected work is the missing building block for future-proof production.

The status quo: these are the most important key facts

1. Only 3% of companies have gone completely paperless so far. Nevertheless, a large proportion of companies are already partially or largely paperless (79% in total).

2. Paper-based production processes affect the entire process chain.

3. Paper-based process costs are in the high five figures for the majority of study participants, and over one-third of respondents cannot quantify the exact costs.

4. The clear majority (68%) see Connected Work as a future field; a large proportion (80%) already have implementations in this direction to varying degrees.

5. 28% see themselves as leaders in the implementation of Connected Work - a view that varies, however, by industry. Here, it is worthwhile to exchange views with the spearheads.

6. ERP systems (49%) and mobile apps (45%) are currently the most used technologies to support deskless workers.

The future of Connected Work

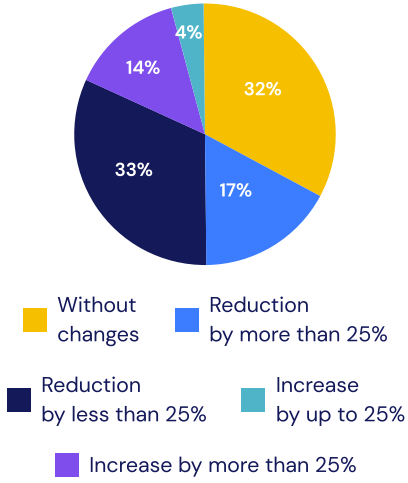
The future of work: companies must continuously reinvent themselves

It is impossible to imagine manufacturing without the worker

As companies increasingly move away from paper-based processes and operational staff work in a purely digital environment in the future, the question arises as to how this will change the role and field of activity of the frontline worker. The following insight, which can be derived from the responses of the study participants, is interesting: Lights Out Manufacturing in the sense of completely automated, operatorless production is not a realistic picture of the future, even in the next few decades. Instead, the worker himself will gain in importance.

This is evident from the responses of the study participants to the question about the presence of the frontline worker on the shopfloor in the next 10 years: 50% of the respondents expect a reduction in the number of operational employees, with the majority (33%) anticipating a reduction of less than 25%. One-third (32%) predict no change and 18% even believe there will be an increase in employees. In summary, this means that the shopfloor will not be able to do without the operational employee in the future and that, overall, a shift rather than a reduction in the workforce is to be expected.

How will the number of operational employees on the shopfloor change over the next 10 years?



A new role model will change the shopfloor

In addition, these results say something about the role of the operative employee: They will continue to play a key role in the future beyond automated manufacturing processes. However, the study participants assume that the worker's job profile will change significantly, as shown by the answers to the question about the task of the operational employee now, in 10 years and in 20 years: While the current focus is on "standard work" activities, non-repetitive activities will come to the fore in the next 10 to 20 years. Specifically, these include areas of activity such as monitoring, control and troubleshooting, as well as conceptual work and optimization measures. The respondents thus assume a shift away from repetitive activities toward a conceptual-analytical way of working. This will have a major impact on the requirements profile of the frontline worker, and it will be interesting to see what responses companies develop to this.

In your opinion, what is the role of the operational employee in production?

	Performance of frequently recurring activities (Standard Work)	Performance of infrequently recurring activities (Standard Work)	Monitoring, control and troubleshooting	Conceptual work and optimization measures	Without role
Now	73%	52%	54%	41%	0%
in 10 years	31%	54%	49%	48%	11%
in 20 years	21%	31%	41%	39%	29%

Currently (2022), 73% assume that the operational employee is important for performing frequently recurring activities; in 10 years, only 31% see this and in 20 years, only 21%. The focus of activities will thus shift.

Benjamin Brockmann
Co-Founder & CEO of Operations1

Bernd Hausler
Managing Director at the ifm group of companies

"Operational employees must view digital technologies as partners" – Interview on the role of tomorrow's frontline worker

There is a widespread fear that, as technology develops, it will curtail the frontline worker's job or even make it superfluous. However, if, as the results of our survey suggest, the requirement profile of operational employees shifts more toward conceptual activities in the coming decades, this fear is unfounded. It will then become even more important for manufacturing employees to develop a deep understanding of digital tools and see them as allies that make their work more efficient and productive, streamline processes and drive operational excellence.

This is also the view of Bernd Hausler, Managing Director at ifm, the leading provider of innovative automation technology. In an interview with CEO and Co-Founder Benjamin Brockmann, he emphasizes: "For me, people will remain the focus of production in the future. The digital factory puts him less in the background, but supports him with the analysis of important data and correlations." Accordingly, Hausler believes it will be crucial in the coming years that digital tools are viewed by workers as partners rather than adversaries. Companies that create awareness of this are fit for the future.

Learn more in the interview.

Listen to the complete interview in the Future Proof Operations podcast

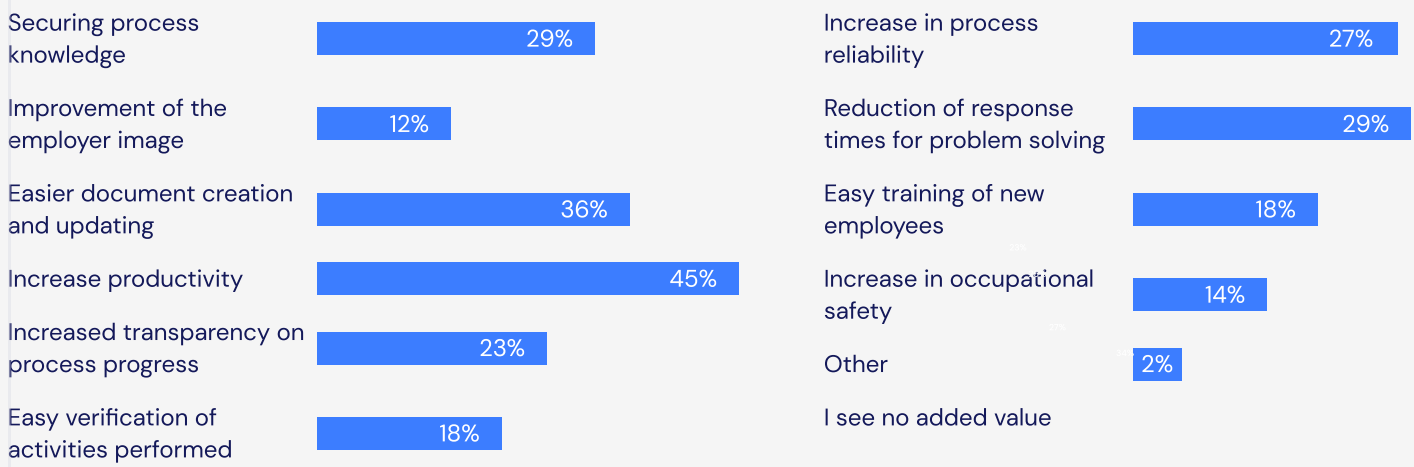
The role of the worker in interaction with digital tools will thus change significantly in the long term. And manufacturing companies are already using a wide variety of tools to empower their employees. When asked about the central motives, a multifaceted picture emerges, which we would like to discuss in more detail below.

Operational excellence, increased resilience and future viability: Connected Work has many advantages

When asked about the greatest value Connected Work can bring to the manufacturing industry, participants' responses fall within the range of what is usually associated with the benefits of connected work. The **top 5 added values** include:

- Increased productivity (45%)
- Easier creation & updating of documents (36%)
- Securing process knowledge (29%)
- Shortening response times for problem resolution (29%)
- Increased process reliability (27%)

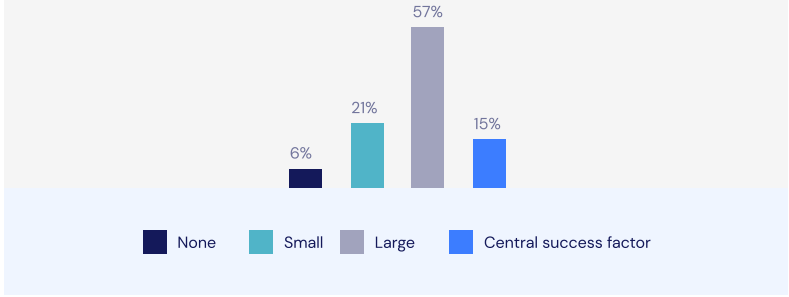
Where do you see the greatest added value of Connected Work in your industry?



In addition to operational motives such as increased productivity, the study participants also see strategic aspects that speak in favor of Connected Work, as shown by the safeguarding of process knowledge (29%) against the backdrop of the shortage of skilled workers.

A full 72% even consider a modern working environment to be a key success factor or assign it a significant role when it comes to retaining old employees in the long term and attracting new ones.

What role does a modern work environment play in attracting and retaining employees in a manufacturing environment?



Where to focus? Quality assurance and manufacturing would benefit most from digital solutions – with industry-specific differences

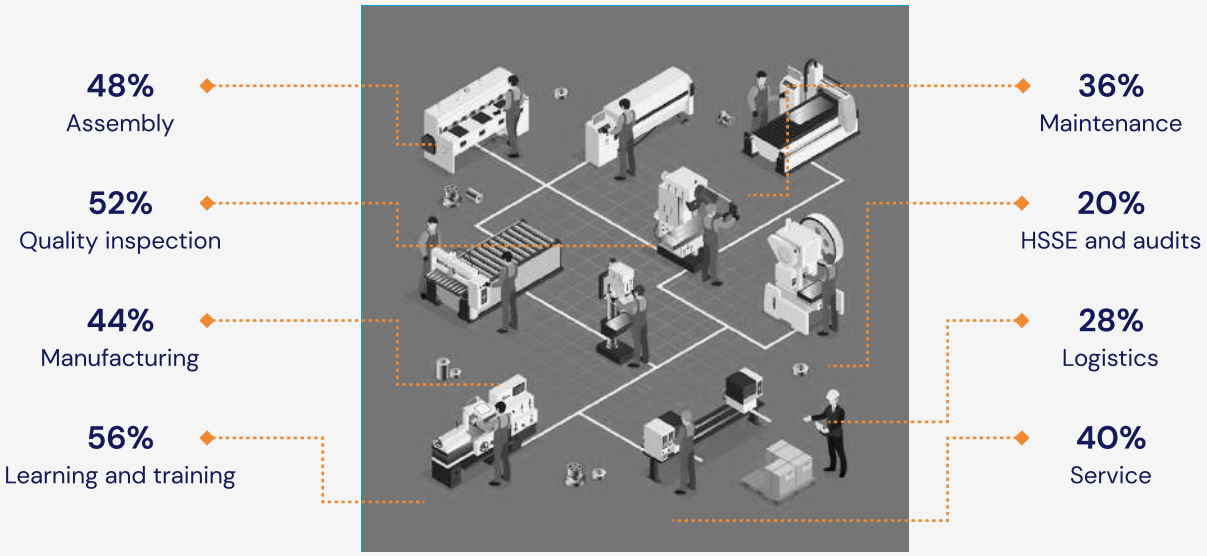
The fields of activity on the shopfloor vary widely, and so we asked the study participants which areas would benefit most from digitization. The results of the survey show that across all industries, quality assurance (51%) and manufacturing (42%) are the most important areas of activity in which the operational workforce would benefit from digital support (see the graphic in the appendix on page 27).

However, the focus areas vary here depending on the industry: in mechanical engineering, the potential is seen as fairly balanced between the areas of manufacturing (44%), assembly (48%), quality assurance (52%) and learning/training (56%) (see appendix p. 27).

In the automotive sector, the impact of digital solutions is also considered to be relatively equal in the application areas of manufacturing (46%), assembly (50%), maintenance (50%) and quality assurance (46%). Due to the high level of automation, learning & training (35%) seems to be less of an issue there.

Comparing the values with the other industries, the area of learning and training in mechanical engineering would benefit the most from digital tools. This need is less pronounced in the other industries.

Which areas would benefit most from digital solutions? Comparison by use case

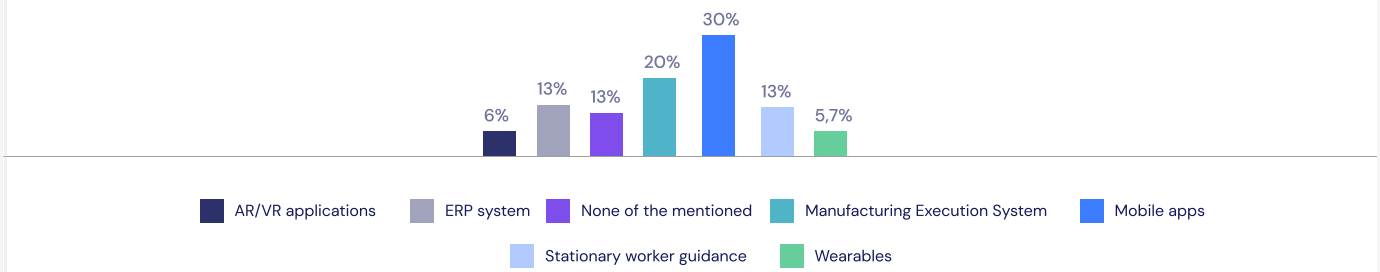


Which technologies will companies rely on in the future?

In the context of an increasing trend toward connected work, it is particularly interesting to see which technology companies expect to generate the greatest added value for strengthening the operational workforce in the long term. The answer of the study participants to this question may come as a surprise, because they see the greatest long-term gain in mobile apps (30%) and not - as one might have assumed - in AR/VR apps (6%) or wearables (5.7%), which fare comparatively poorly. However, this assessment should also take into account that it may well change with further technological progress.

In contrast, it is hardly surprising that the ERP system is not seen as a tool for the worker in the future (13%), despite its predominant current use.

Which technology do you expect to add the most value to empower your operational staff?



The future of work: these are the most important key facts

1. Workers will not disappear from the shopfloor, but their roles will change significantly: from standard work to conceptual activities.

2. Companies need to respond to the new worker job profile today: with special training that teaches analytical and software skills, with user-friendly digital tools, and with special requirements for new hires. The ability to adapt to technological changes will be essential.

3. By optimizing the entire process chain, Connected Work increases a company's resilience and future viability in the long term. A modern working environment designed in this way will be a key factor in the employer branding strategy in the future.

4. Across industries, the operational workforce in quality assurance and manufacturing would benefit most from digital solutions. Industry-specific, the focus areas vary.

5. When it comes to the technologies with the greatest technological benefit in the future, mobile apps are clearly in the lead (30%). The ERP system (13%) is hardly seen as adding any value for the worker, and AR/VR applications (6%) and wearables (5.7%) are not expected to do so, at least not at present.

How the path succeeds

How the path succeeds: systematically, farsightedly & with good change management

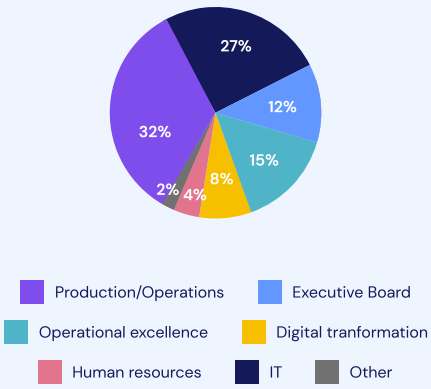
What are the drivers of Connected Work?

How can Connected Work be successfully implemented and what are the key factors? This question was of particular concern to us when we launched the survey. The respondents' answers provide fascinating insights into the scope of the topic and show that both "hard" and "soft" factors are among the drivers.

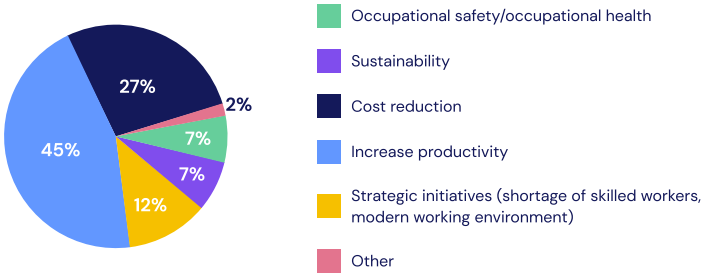
If we first take a closer look at how companies are proceeding with the implementation of Connected Work, surprising things come to light. The initiatives for connected work are being driven by very different areas and hierarchical levels: As expected, Production/Operations (32%) and IT (27%) are in the lead. It is interesting to note that for 12% of the study participants, connected work is even an executive board topic.

From the broad spectrum of responses, one key finding can be derived: Digitization projects can only be successfully implemented on a large scale if it is very clear in advance which department is responsible for the topic.

Which department is driving Connected Work in your company?



What is the best possible argumentation to get internal budget for digitization projects for operational employees?



Arguments that are convincing when it comes to winning budget for Connected Work

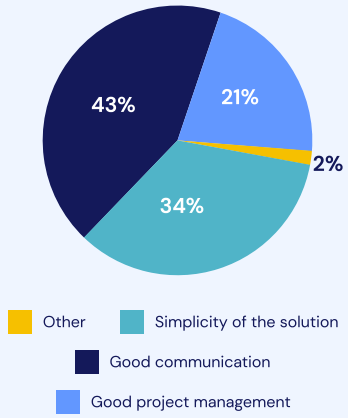
Once the vision has been developed, the scope defined and a desired technology identified, operational teams are faced with the challenge of obtaining budget for their project. According to the survey, the argument of increasing productivity (45%) is far ahead for successful budget approval, followed by the argument of reducing costs (27%) and, finally, strategic initiatives such as remedying the shortage of skilled workers and creating a modern working environment (12%). In contrast, arguments such as sustainability (7%) and occupational safety (7%) appear to have much less traction.

Good change management is essential in the implementation of Connected Work

While "hard factors" such as productivity increases and cost savings are the central drivers for convincing companies of the necessity of Connected Work, a completely different factor is crucial for the successful introduction of Connected Work itself: value-creating communication that permanently involves the employee. This is shown by the responses of the study participants to the question about the central success factor for ensuring a high level of acceptance of new technologies. Here, the clear majority (43%) cite good communication as the driving factor for implementing networked work. It is remarkable that this aspect is even more important to the respondents than the simplicity of the technological solution (34%) and considerably more important than good project management (21%).

Conversely, this means that companies should place greater emphasis on good change management when implementing connected work.

What is the key success factor in ensuring a high level of acceptance of new technologies?



Rafael Koch
Head of Customer Success,
Operations1

"A successful Change Management involves everyone" - Interview with Rafael Koch

Rafael Koch, Head of Customer Success bei Operations1, hat schon viele Change-Management-Prozesse erfolgreich begleitet. Zwei Aspekte sind dabei für ihn besonders entscheidend:

1. Ein erfolgreicher Veränderungsprozess hängt nicht vorrangig am eingesetzten Change-Management-Modell. Entscheidend für das Gelingen sind Kommunikationsstärke und Empowerment.

2. Change Management lebt von einer realistischen Erwartungshaltung, die auf Nachhaltigkeit anstatt auf sofort sichtbaren Ergebnissen basiert.

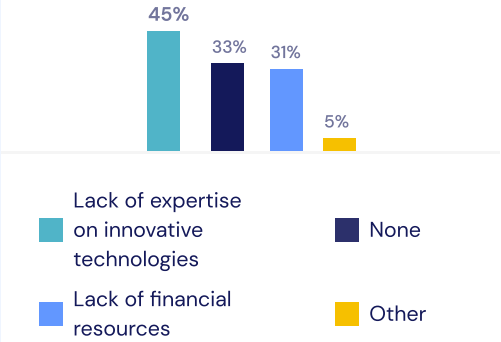
Read in the interview how you can also recognize successful change management, what the stumbling blocks are and how you can avoid them.

Flexibility and willingness to change as driving companions

To summarize: When implementing Connected Work, it is important, on the one hand, to communicate with employees and actively involve them in the change process, and, on the other hand, to proceed systematically and with foresight by clearly identifying the responsibilities for implementing digitization initiatives from the outset.

In addition, there is another essential aspect without which Connected Work cannot be realized: technological knowledge.
This is made clear by the answers given by the study participants to the question about the internal challenges facing companies in the face of connected work. Interestingly, it is the lack of expertise in innovative technologies that is cited as a central challenge (45%) and is mentioned more often than financial restrictions (31%).

What challenges does your company face with regard to Connected Work?



What does this mean for the future? Companies that want to keep up with the times and successfully implement Connected Work in the long term need to take a close look at the various solutions today and bring on board the specialists who have in-depth technological knowledge or provide focused training for their own employees.

Every company is called upon to find an individual answer to the question of which technology is the most appropriate in each case. As the results of the survey have shown, both the technologies themselves and the role profile of the operational employee are subject to constant change. And this can best be met with openness, curiosity and the willingness to continuously transform.

How the path to Connected Work succeeds: these are the most important key facts

1. Connected Work is driven by different areas and hierarchical levels within the company. It is important for success to define clear responsibilities.

2. Convincing arguments in favor of the introduction of Connected Work are "hard factors" such as productivity increases and cost reductions. In the subsequent implementation of Connected Work, successful change management that carefully and far-sightedly involves all stakeholders is crucial.

3. In order to successfully implement Connected Work in the long term, companies need in-depth technological expertise. Companies must be aware that this knowledge is subject to constant change and jump on the bandwagon in good time.

Would you like to discuss the results or give us feedback on the study?

Feel free to contact us directly via LinkedIn. You can find the link to the respective author profiles in the appendix.

Appendix

About the authors

Benjamin Brockmann

CEO & Co-Founder of Operations1

Benjamin founded cioplenu GmbH, now Operations1, together with Daniel Grobe and Anian Ziegler in 2017. The founders developed the software solution based on various practical projects, including at the Fraunhofer Institute, and on their experience in industry, auditing and management consulting. Benjamin has already worked for companies such as KPMG and Arthur D. Little. He holds a Master of Science in Management and Technology.

Stefanie Evita Ibrahim

Content Marketing Manager at Operations1

A graduate in German and Romance studies (M.A.) and former editor at well-known publishing houses, Stefanie previously worked at several large and small companies and was able to gain a lot of experience in a wide range of topics. Her interest in technology and digital innovation eventually led her back to a start-up.

Bernd Hausler

Managing Director at the ifm Group

The graduate engineer has been working for the ifm group of companies for more than ten years and has been involved in the digital process there from the very beginning. Previously, he gained in-depth experience as Plant Production Manager at the automotive supplier Brose and as Operations Director at KaVo, a leading international company in the dental industry.

Moritz Stern

Head of Marketing and Strategy at Operations1

Prior to joining Operations1, Moritz worked at Strategy&, PwC's strategy consulting practice. Here he advised clients from the operations environment around the globe on strategic issues. Previously, Moritz worked for Alstom Power, Merck KGaA and Arthur D. Little. He holds a degree in industrial engineering (M. Sc.).

Stefan Philipp

Head of Solutions at Operations1

Stefan is responsible for the Solutions division at Operations1 and, together with his team, supports customers from the problem definition stage through to the fully integrated Connected Worker platform. The industrial engineer (M. Sc.) previously worked as a venture development and innovation manager for digital services at BSH Hausgeräte GmbH in the Bosch Group. Over the last 10 years, he was able to gain experience and optimize operational processes in other well-known corporations (Lufthansa, Continental, Bosch Rexroth).

Rafael Koch

Head of Customer Success at Operations1

An industrial engineering graduate (Bachelor of Engineering), Rafael previously held various roles at Operations1 with a strong product and customer focus and knows the challenges of industry and software development well. Prior to his career at Operations1, he worked in project management for the aviation industry. In addition, he gained experience working in risk management globally. Rafael is a certified PMP by PMI.

Press contact

Anna-Karina Dawkins

Senior Field Marketing Manager at Operations1

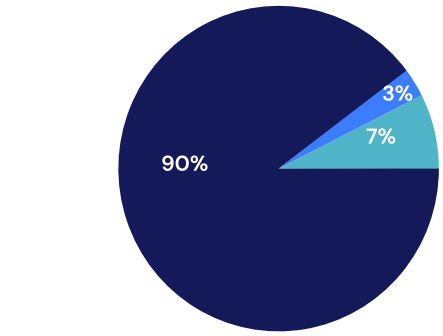
Anna is your contact for press, social media and events. Before joining Operations1, she worked in marketing at SimPlan AG, a simulation service provider. Anna discovered her passion for marketing during her first employment at Deutsche Tele Medien GmbH. During this time, she also completed her Bachelor's degree in Business Administration at the FOM in Frankfurt.

Appendix with all graphics from the survey

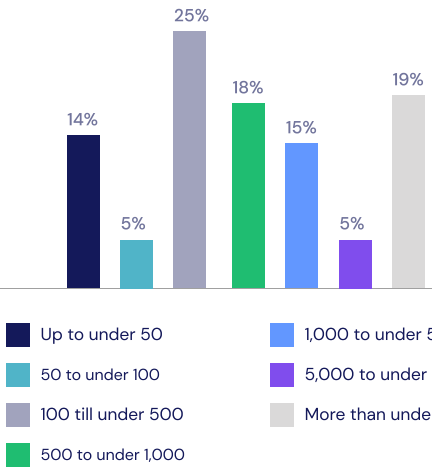
In November 2022, Operations1 conducted a Connected Work survey. The study examined how Connected Work is currently practiced in the industry, what the future of Connected Work looks like, and how to get there in concrete terms. For this purpose, 175 specialists from the production environment in the DACH region were surveyed.

This appendix brings together all the study results in a clear format for self-study, starting with the demographic information of the survey participants for a better understanding. Finally, we present a guide for the successful implementation of Connected Work, based on many years of experience with our customers.

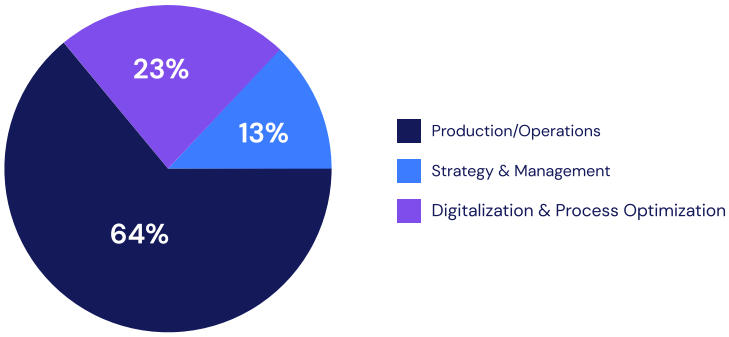
In which country do you work?



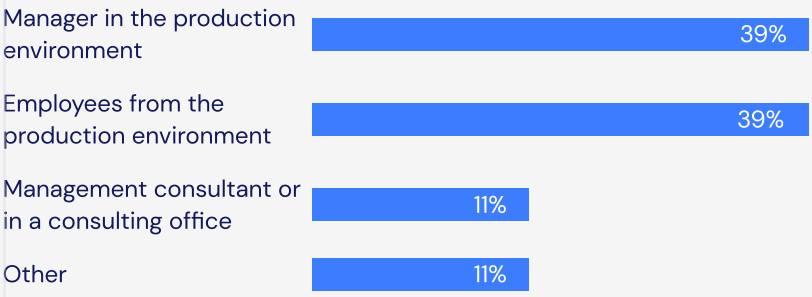
Study participants by company size



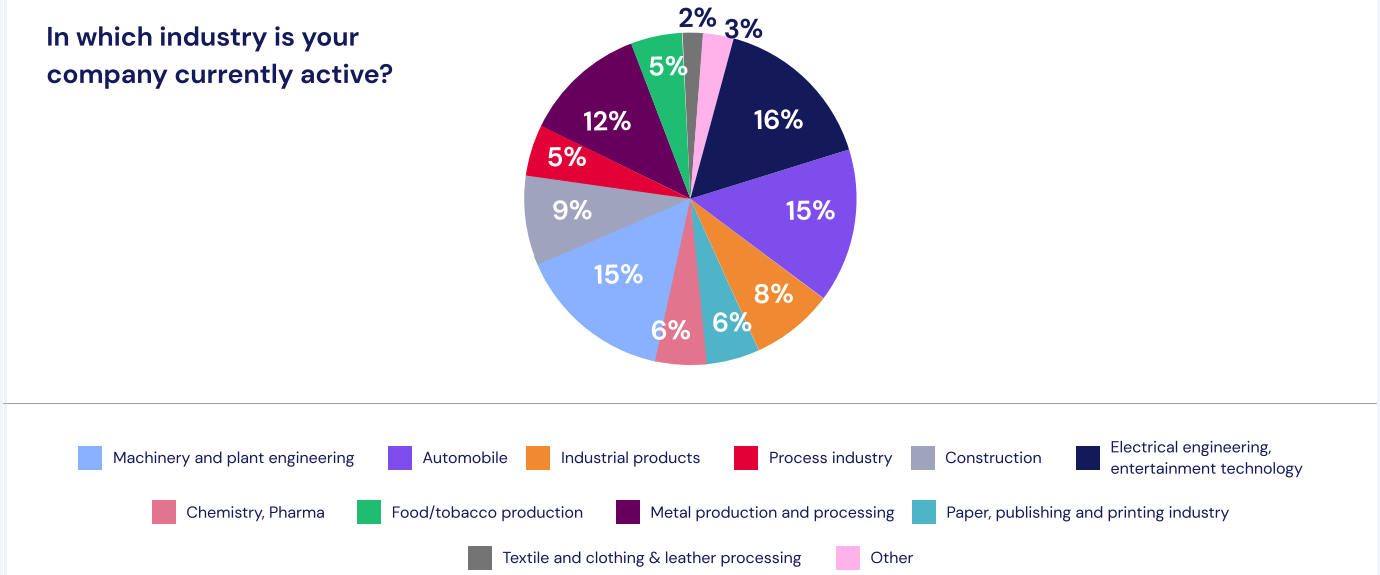
In which of these areas do you focus your activities?



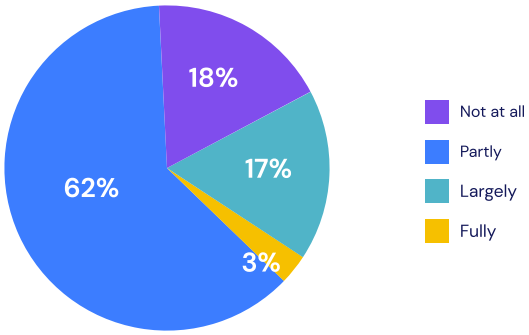
In which position do you work in your company?



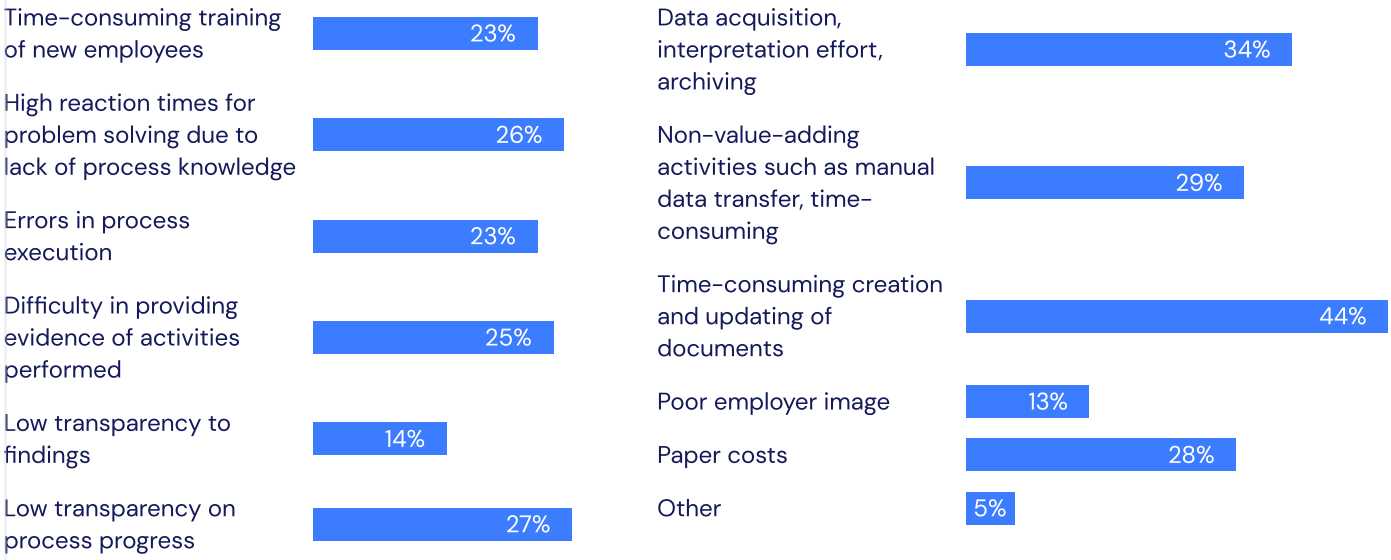
In which industry is your company currently active?



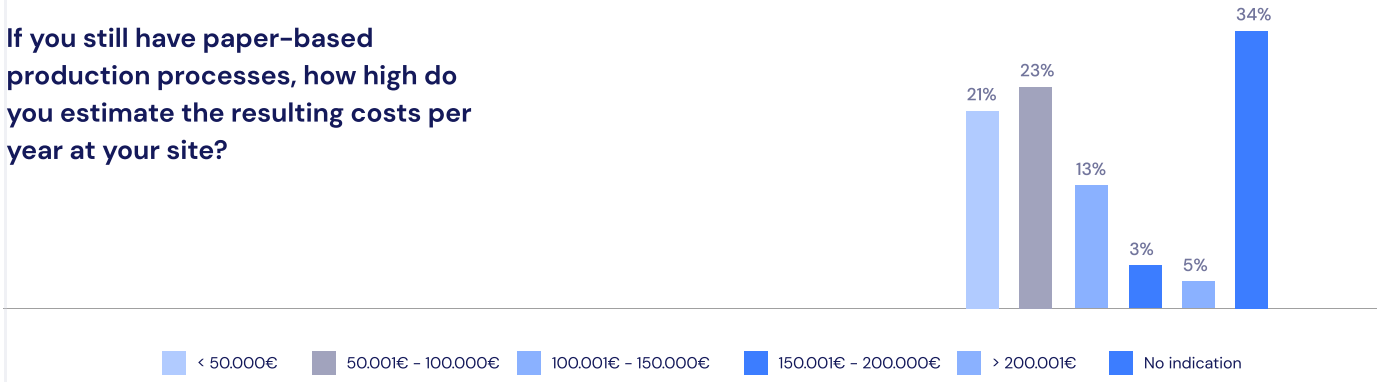
My company is already paperless



If you still have paper-based production processes, what are the 3 biggest challenges from this?

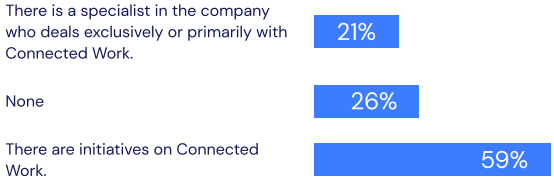


If you still have paper-based production processes, how high do you estimate the resulting costs per year at your site?

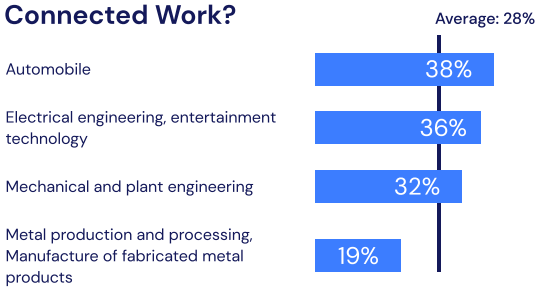


Do you see Connected Work as a future field?

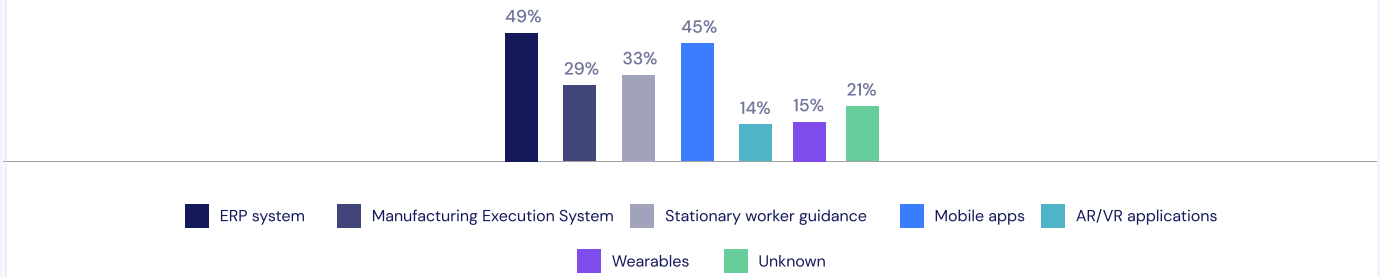
What importance does Connected Work currently have in your company?



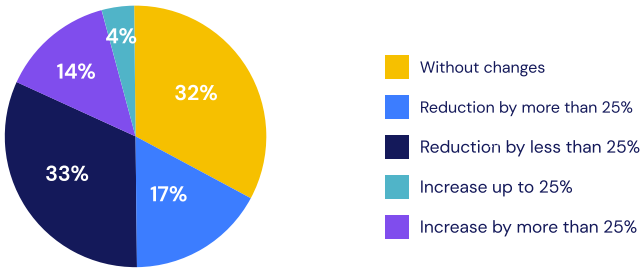
Do you consider yourself a leader in the implementation of Connected Work?



What technologies do you already have in place to support operational staff?



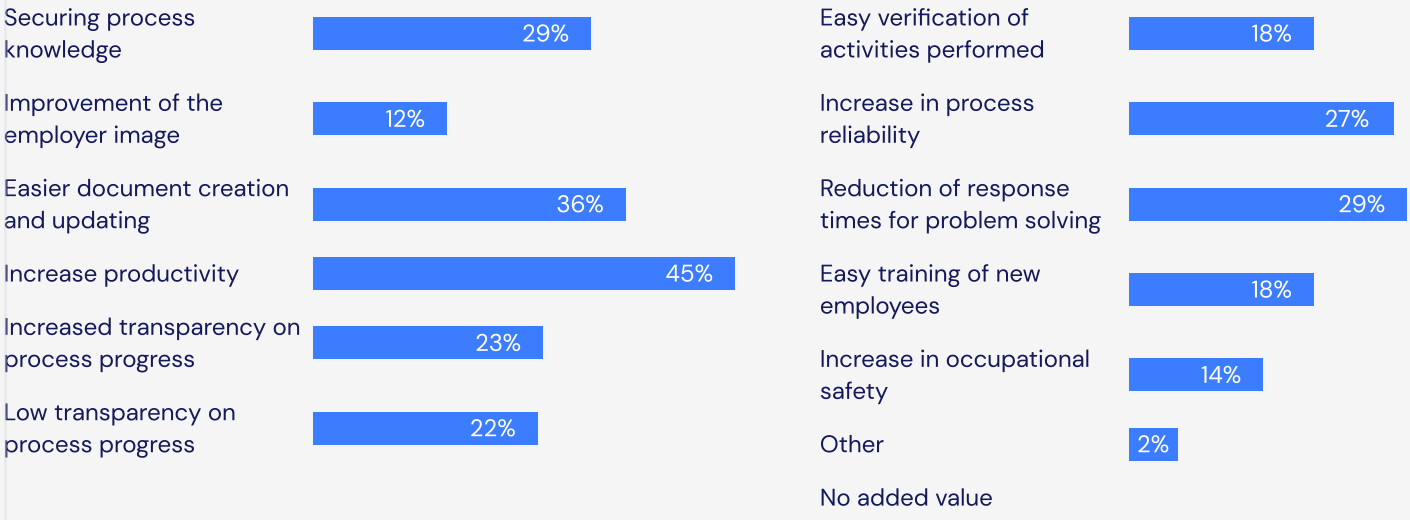
How will the number of operational employees on the shopfloor change over the next 10 years?



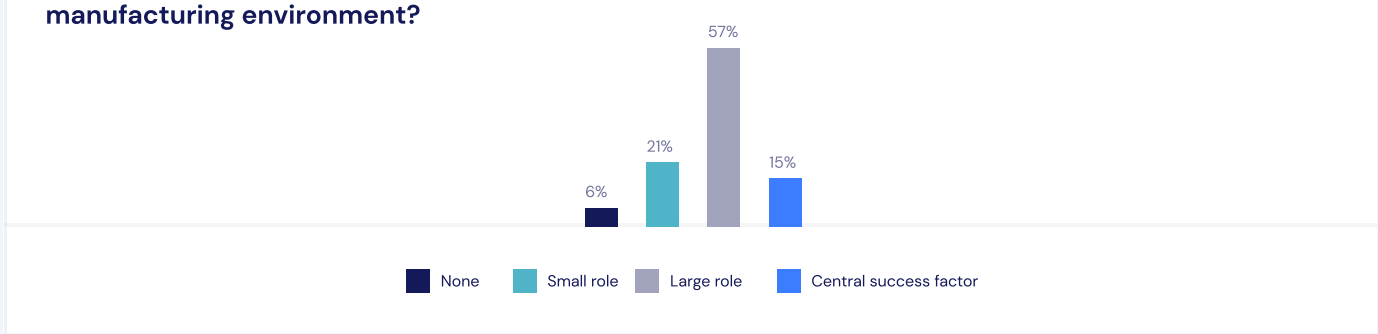
In your opinion, what is the role of the operational employee in production?

	Performance of frequently recurring activities (Standard Work)	Performance of infrequently recurring activities (Standard Work)	Monitoring, control and troubleshooting	Conceptual work and optimization measures	No longer a role
Now	73%	52%	54%	41%	0%
in 10 years	31%	54%	49%	48%	11%
in 20 years	21%	31%	41%	39%	29%

Where do you see the greatest added value of Connected Work in your industry?



What role does a modern work environment play in attracting and retaining employees in a manufacturing environment?



In which operational areas do you see the greatest leverage/impact from digitally supporting the operational workforce?

Cross-industry assessment

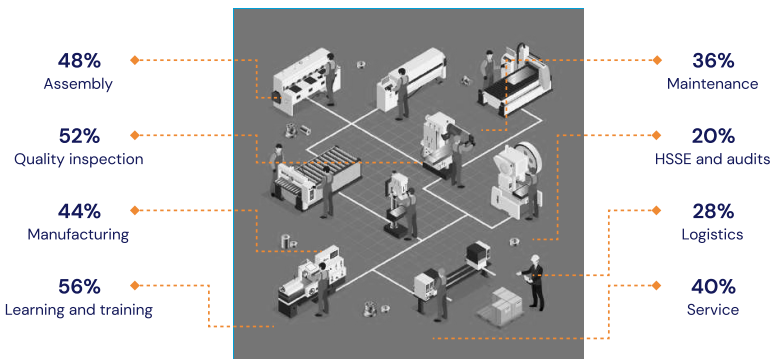
Manufacturing	Assembly	Maintenance	Quality assurance	Logistics	No longer a role
42%	34%	33%	51%	35%	35%

Service	Audits & HSSE	Learning & Training	Other
32%	15%	32%	2%

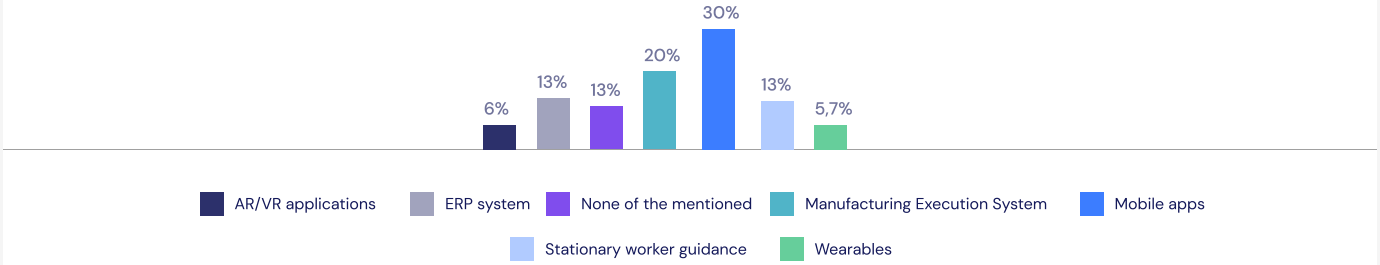
Industry-specific assessment

	Manufacturing	Assembly	Maintenance	Quality Assurance	Logistics	Service	Audits & HSSE	Learning & Training	Other
Machinery and plant engineering	44%	48%	36%	52%	28%	40%	20%	56%	0%
Automobile	46%	50%	50%	46%	38%	27%	8%	35%	0%
Industrial products	43%	36%	43%	64%	29%	29%	21%	21%	7%
Process industry	38%	38%	25%	63%	50%	63%	38%	38%	0%
Construction	33%	13%	20%	40%	47%	20%	20%	27%	0%
Electrical engineering, entertainment technology	32%	32%	36%	50%	21%	43%	4%	25%	4%
Chemistry, Pharma	40%	10%	30%	30%	30%	20%	10%	30%	0%
Food/tobacco production	67%	22%	56%	67%	56%	22%	44%	44%	11%
Metal production and processing, Manufacture of fabricated metal products	57%	33%	19%	48%	43%	10%	14%	19%	0%
Paper, publishing and printing industry	30%	20%	10%	40%	40%	50%	0%	20%	0%
Textile and clothing & leather processing	25%	25%	25%	75%	50%	25%	0%	25%	0%
None of the above	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	1%	2%	1%	4%	1%	3%	1%	2%	1%

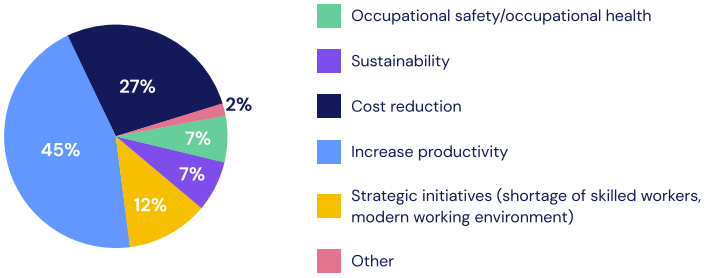
Comparison by use case



Which technology do you expect to add the most value to empower your operational staff?



What is the best possible argumentation to get internal budget for digitization projects for operational employees?



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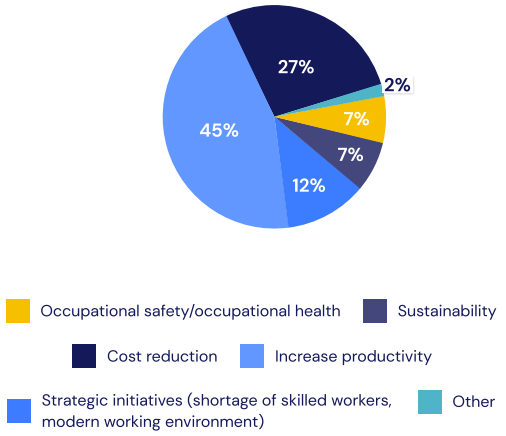
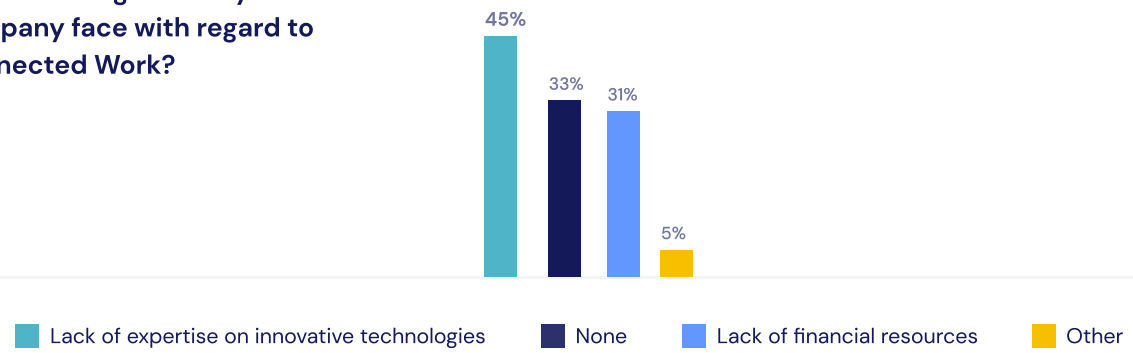


What is the key success factor in ensuring a high level of acceptance of new technologies?

What challenges does your company face with regard to Connected Work?



Guide for the implementation of Connected Work

Integrating connected work into your own company is a complex process that needs to be set up properly. First of all, it is important to select the right Connected Worker platform - i.e., the technological solution for implementing Connected Work. In our experience, the following small-step approach has proven successful:

1. Formulate goals

Which process-related or economic goals are being pursued? A clear formulation of objectives helps to have a guiding star for complex technical issues.

2. Define clear responsibilities

Who plays which role in finding a solution? Which departments need to be involved, what reservations and interests do internal IT, the works council and the legal department have? Who is authorized to make decisions up to which budget?

3. Research solutions

Keyword searches on online search engines and industry events, as well as your own network, are good starting points for research.

4. Set evaluation criteria

In order to make an objective selection, evaluation criteria such as ROI, user-friendliness, flexibility and scalability should be defined in advance.

5. Contact solution providers

Online, most solution providers offer the option of contacting them via a form. Web demos are a good way to get deeper insights into a solution and ask questions.

6. Compare solutions

Based on the evaluation criteria, the solutions can be compared and the respective favorite crystallizes.

7. Clarify purchasing process

In addition to purchasing, other parties are often involved in the procurement of new technology, depending on the order volume. In order to quickly generate operational added value, it is advisable to inquire about and record one's own purchasing process.

The scalability of the technological solution is fundamental to the success of digitization projects. This is the prerequisite for significant effects in the form of savings, quality improvements and greater security. Scalability is best assessed by understanding the technical infrastructure. Criteria such as the connectivity of the solution, comprehensive rights and role management, SSO, and a scalable data model help here. In this way, the transition from the pilot phase to a company-wide roll-out is successful.

When starting out, it is advisable to begin with so-called "high-impact use cases". This could be the digitization of maintenance or commissioning, for example. In both use cases, a large contribution can be made with efficiency increases due to the high qualification of employees and the correspondingly particularly slack labor market situation. This then in turn leads to increased momentum for further roll-out. Our customer KraussMafffei, a leading manufacturer of plastics production equipment, has taken precisely this path from digitizing commissioning to end-to-end process mapping. He shares his experiences in our success story.

operations[1]

Operations1 is the ideal connected worker platform for industry. With Operations1, you digitally map your worker-led production processes end-to-end: from activity planning and the provision of process knowledge to intuitive process guidance, documentation, live analysis and collaborative incident management. Thanks to Operations1, customers such as Bosch, Daimler Truck, ThyssenKrupp, Trumpf, KraussMaffei and Stabilo benefit from increased employee satisfaction, improved quality and productivity, and a more resilient and flexible organization. Due to its enormous scalability, the platform is used worldwide in more than 15 countries in all processes in maintenance, production, assembly, commissioning, testing, training, HSSE and audits.

Since its founding, the Frankfurt and Augsburg-based company's mission has been to empower operational employees and fully connect them across the organization.

Clipboard becomes tablet, complexity becomes simplicity, blindspot becomes transparency.

Frankfurt I Augsburg