

Final Meeting

Digital transformation in the workplace

A sector-specific study of the European chemical, pharmaceutical, rubber and plastics industry

Dr. Jan-Philipp Kramer, Janosch Nellen
03.12.2018, Brussels



About us

Prognos analyses long term developments ...



- Prognos Economic Outlook®
- German Economy Report 2040
- Working Landscapes 2040

... and current trends,



- Prognos Future Atlas & Digitalisation Compass
- Digital labour market
- Trend Report „Digital State“

develops and evaluates strategies...

- Future policy frameworks
- S3-strategies
- Sector strategies (green economy, chemicals...)
- Scientific support for open social dialogues



... for clients across Europe.

- approximately 150 experts at 8 locations
- ... founded in Basel in 1959,
- ..with Berlin being our centre at Federal level,
- ...and Brussels being our “gateway“ to Europe



What we want to share with you today...

prognos

Wir geben Orientierung.



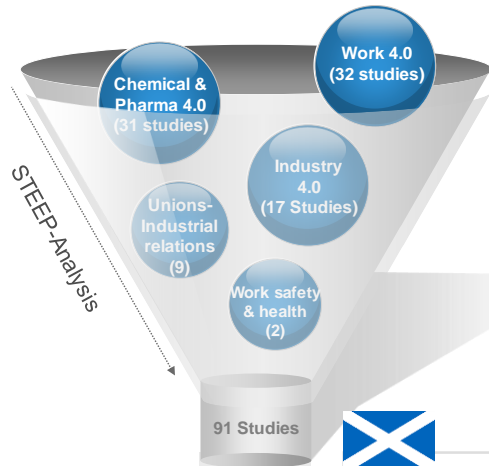
@ <https://www.capital.de>



What do we know about the digital transformation in the workplace so far

State-of-play – European chemicals, pharma, rubber & plastics sector

Literature review



Impacts of the digital transformation on **trade, organization, skills and certifications** in the French chemical industries. It is a necessity to help companies in the digital transformation of the chemical sector.

Knowledge quality and effectiveness: it is necessary to transform more **knowledge opportunities** into concrete actions and **new skills** that can be used in the company context.

Scotland's chemicals sector plays a crucial role in the nation's economy [...] & **enhancing the skills** of those already working in the sector is equally important

The coincidence of **demographic evolutions** with **technological evolutions** creates a need to transfer the in-depth *process knowledge* of the more experienced employees to the younger generation in order to deepen their knowledge of the process.

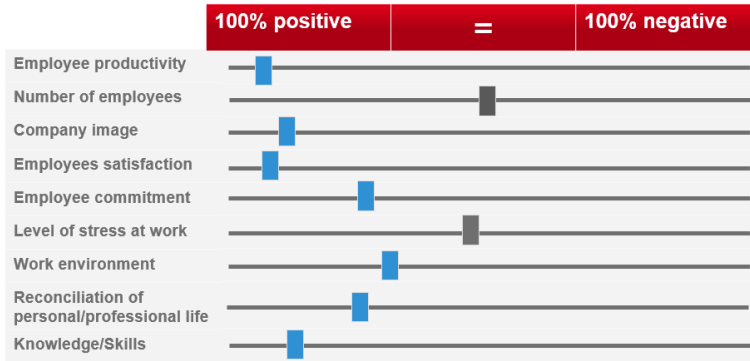
The future of the work we want: challenges that social, economic and political actors must face. It is necessary to act on the **educational and training model** in an accelerated way

Digitalisation requires more **flexibility** and less regulation: *job quality, training, employee data protection, participation, substitution potential* of jobs in the country.

Digital transformation of the chemicals sector



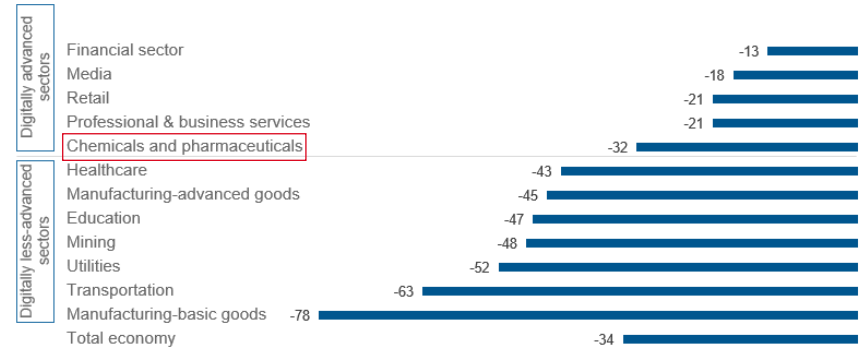
Perception of the impact of digital transformation on Spanish companies



Source: Roland Berger & Siemens (2016), España 4.0, el reto de la transformación digital de la economía



Digitization gap between Poland and Western Europe (%)



Source: McKinsey & Forbes Polska (2016). Digital Poland - Capturing the opportunity to join leading global economies.



To what extent has digitalisation already been implemented in your company?



Source: Fraunhofer & Organisation IAO (2017), Digitisation and the work world in the chemical and pharmaceutical industries in Baden-Württemberg, Page 25, 26



Skills to be developed as a priority in companies



Source: Roland Berger & OPIC (2017). Les impacts de la transformation numérique sur les métiers, l'organisation du travail, les compétences et les certifications dans les industries chimiques.



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Objectives and approach of this sector-specific study of the European chemical industry

This (novel) European social partners project

Two major objectives:

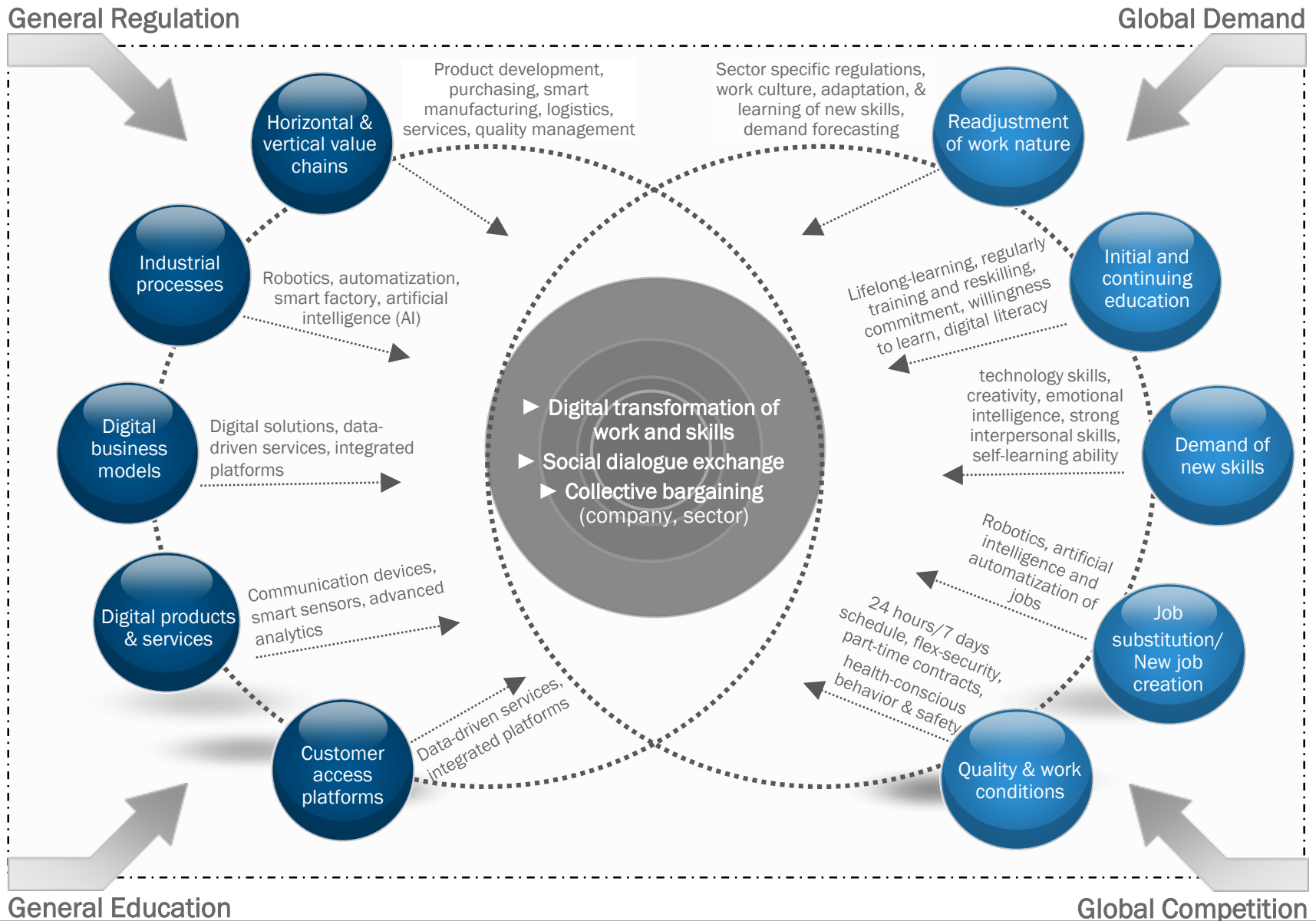


1. Analysis of the **level of awareness** and **identification of sector-specific challenges** for the chemicals, the pharmaceuticals and the rubber and plastics sectors.
2. Identification and interpretation of evidence of the **concrete influence** of digital transformation on three domains:
skills, working patterns, health & safety.



Anticipating, preparing and managing the digital transformation in the workplace is a decisive task.

BUT: To date there is **no study that presents cross-European evidence** of the digital transformation in the European chemicals, pharma, rubber & plastics sector.





Key pillars of digital transformation in the chemicals, pharma, rubber & plastics sector

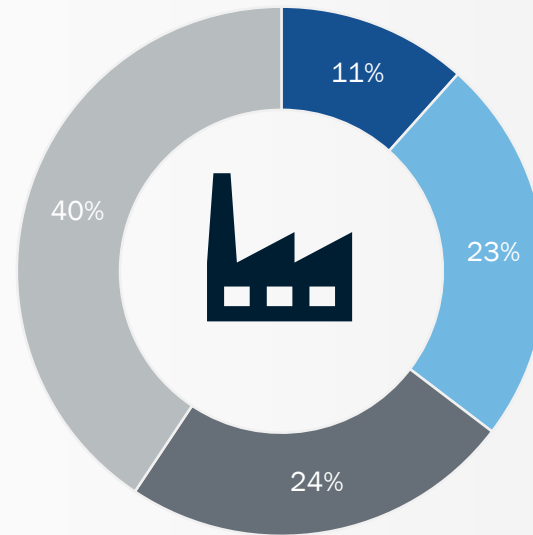
Drivers and determinants

About 80 Percent of participants are company representatives...



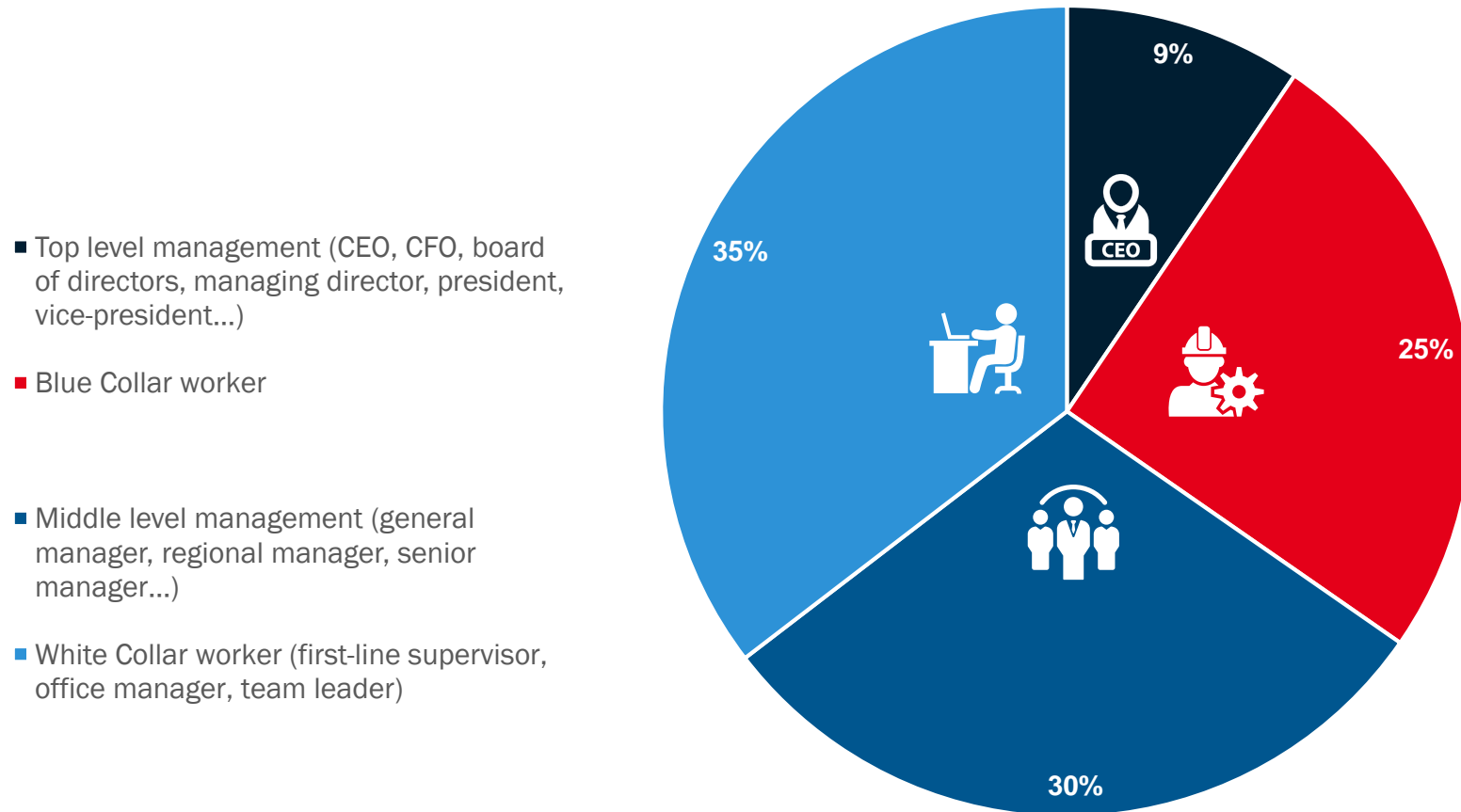
n=501

...which work for companies of all sizes.



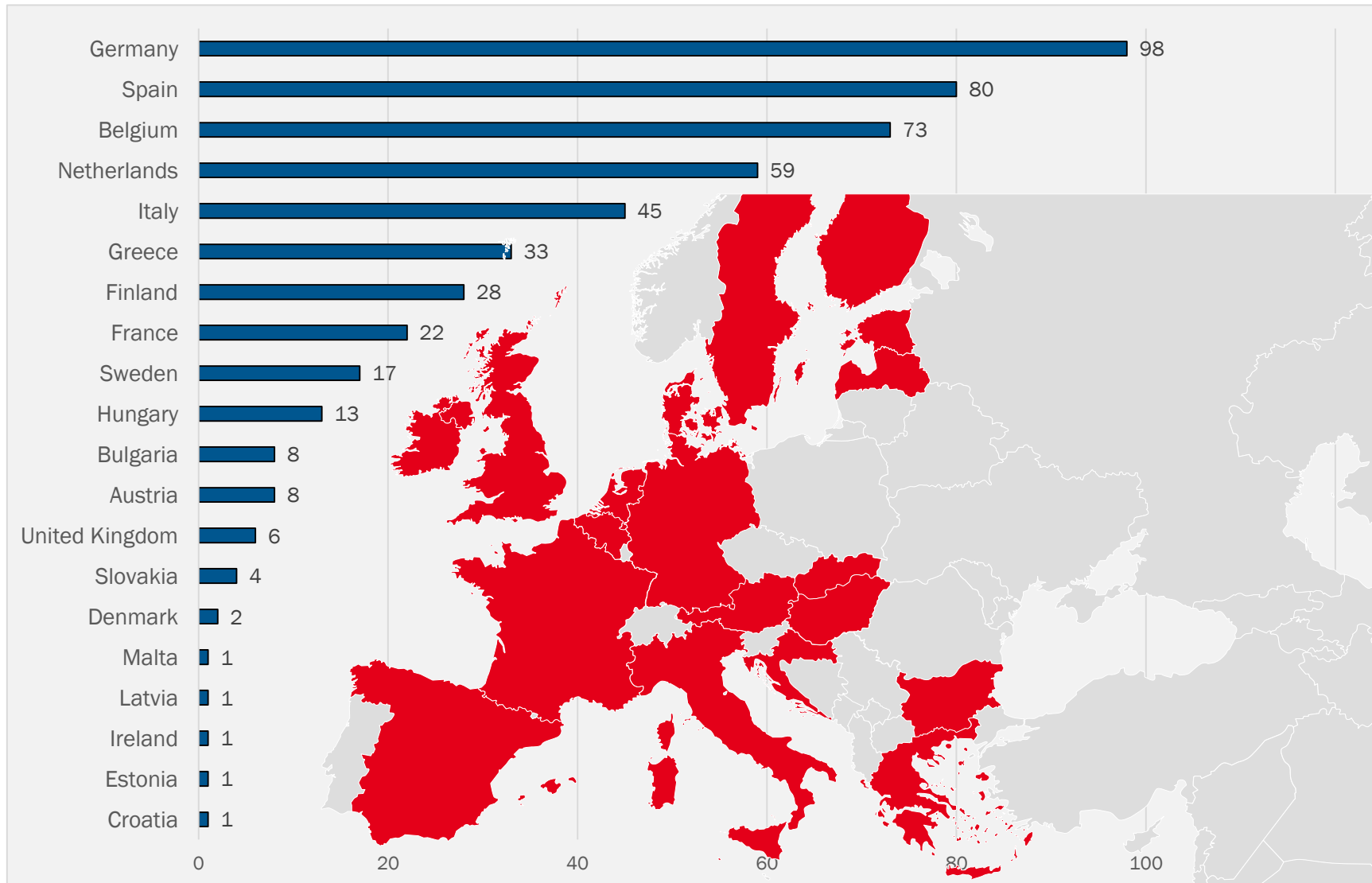
- Micro or small enterprise (1-49 employees)
- Large enterprise (250-999 employees)
- Medium-sized enterprise (50-249 employees)
- Very large enterprise (1000+ employees)

n=397



n=401. Question only for company representatives.

The survey participants – broad country coverage with focus in Western European chemical regions



n= 501



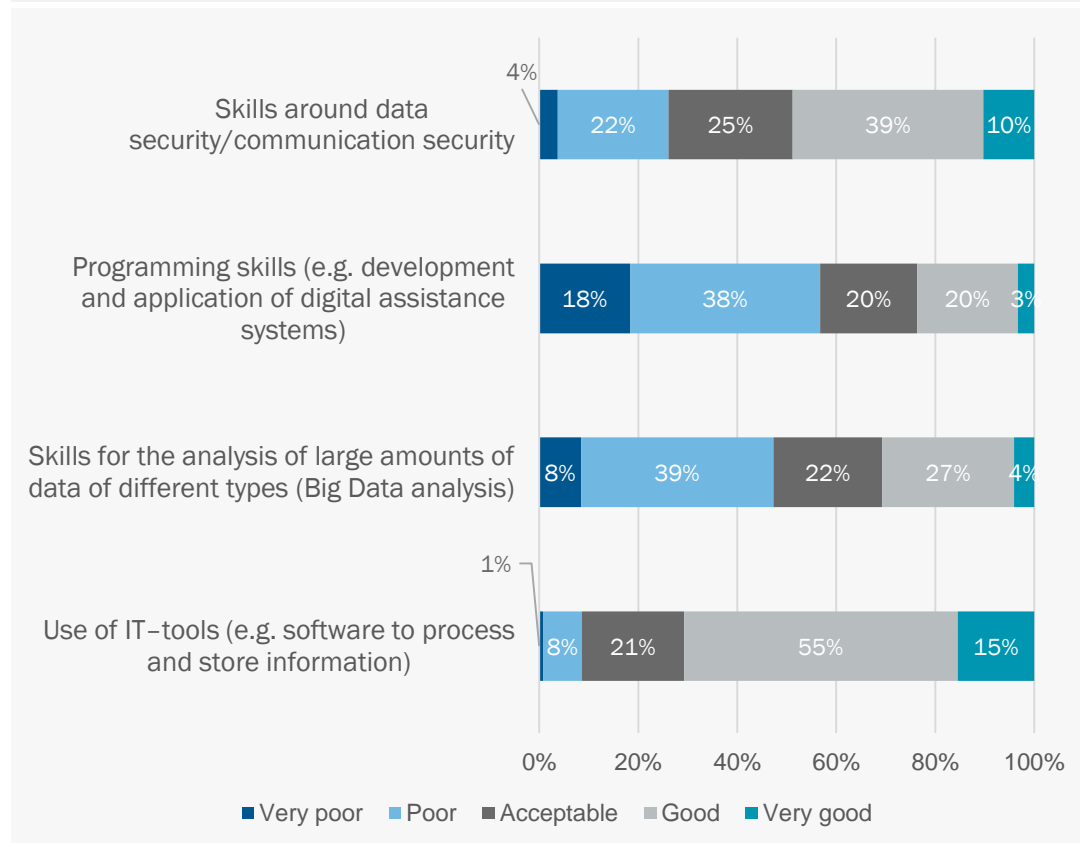
Digital transformation of work: skills, working patterns, health & safety

Survey findings

How do you assess the following technical skills of your employees / your industry in the context of digitalisation?



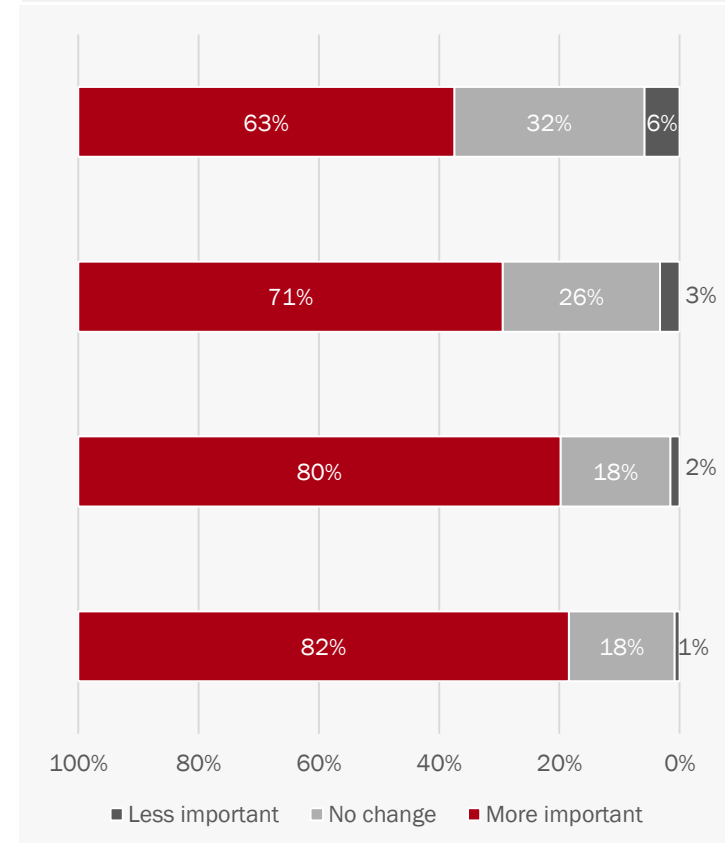
Assessment of current skills of employees



n= 368-407

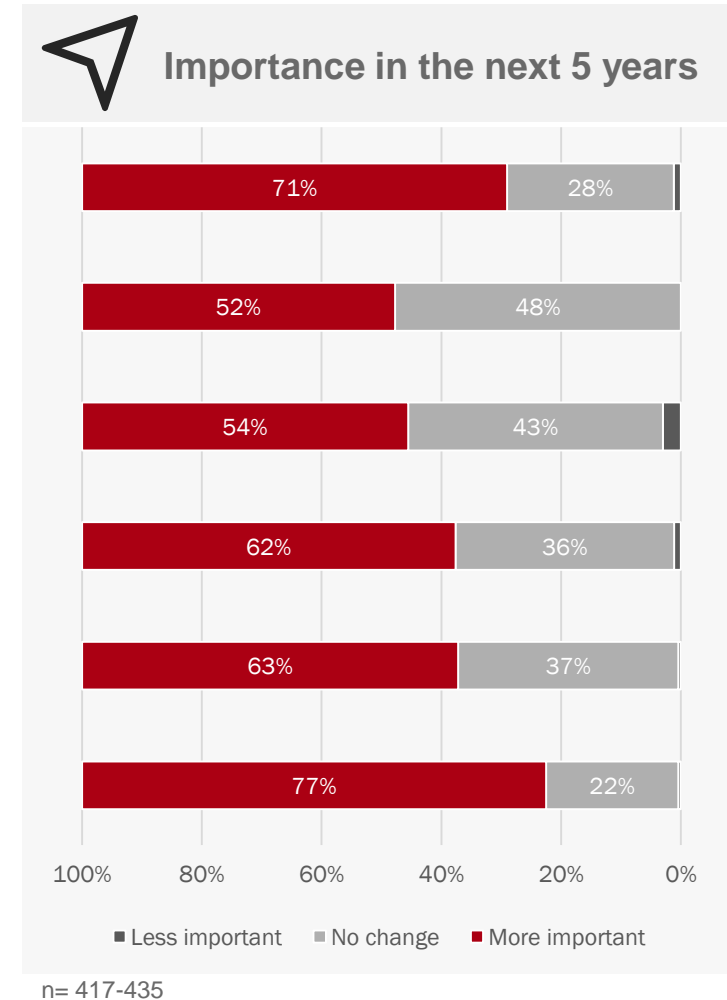
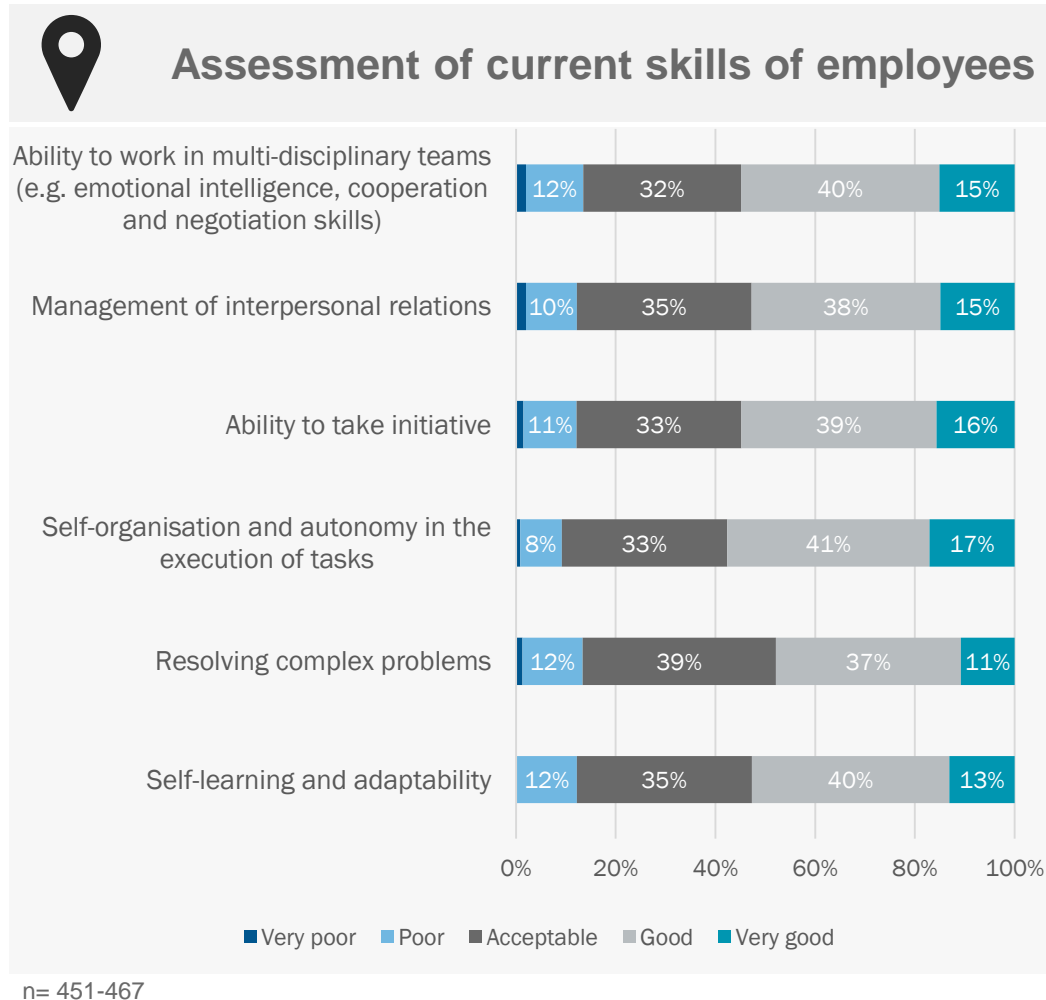


Importance in the next 5 years

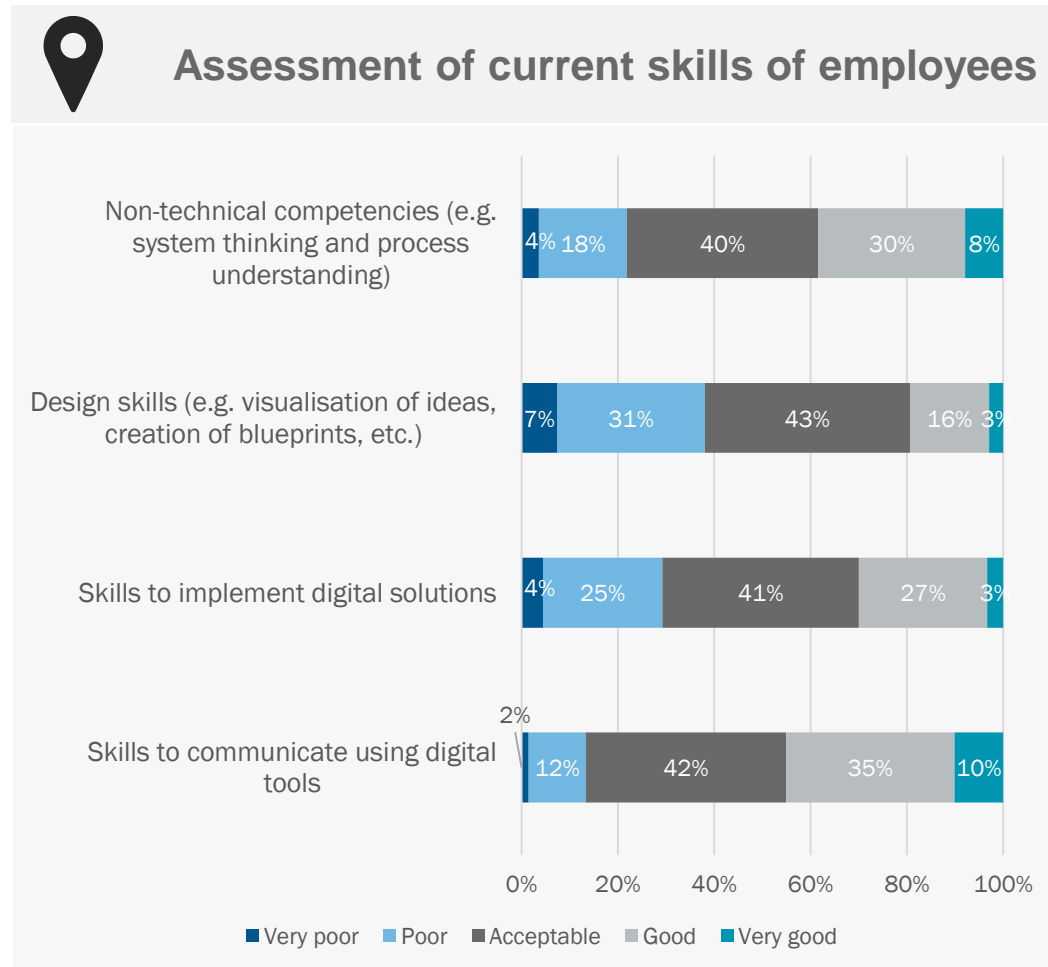


n= 424-456

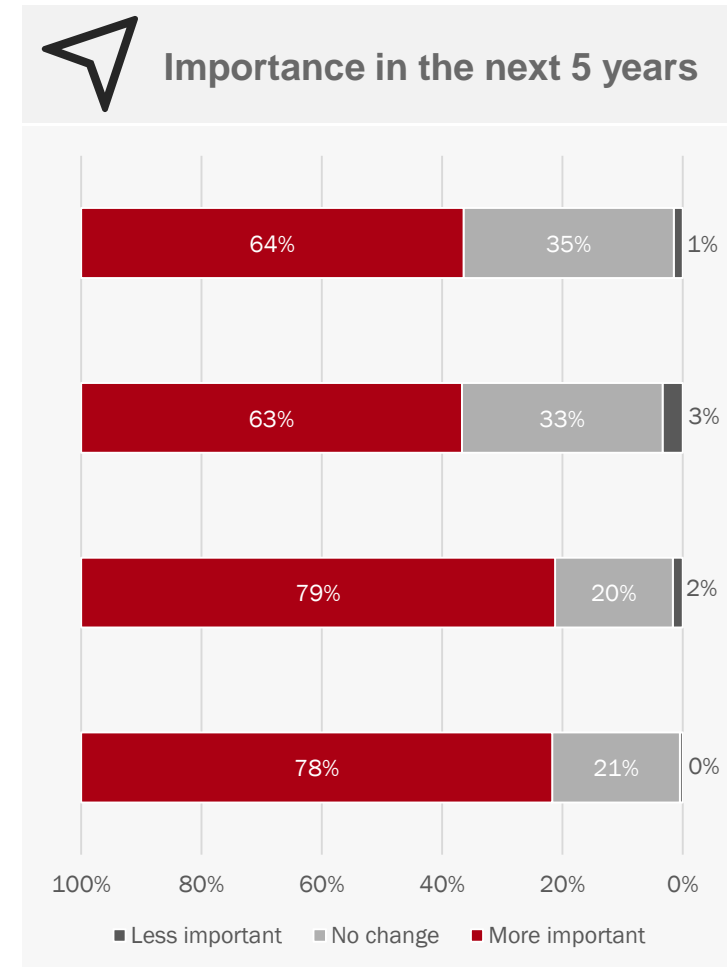
How do you assess the following social skills of your employees / your industry in the context of digitalisation?



How do you assess the following transversal skills of your employees / your industry in the context of digitalisation?



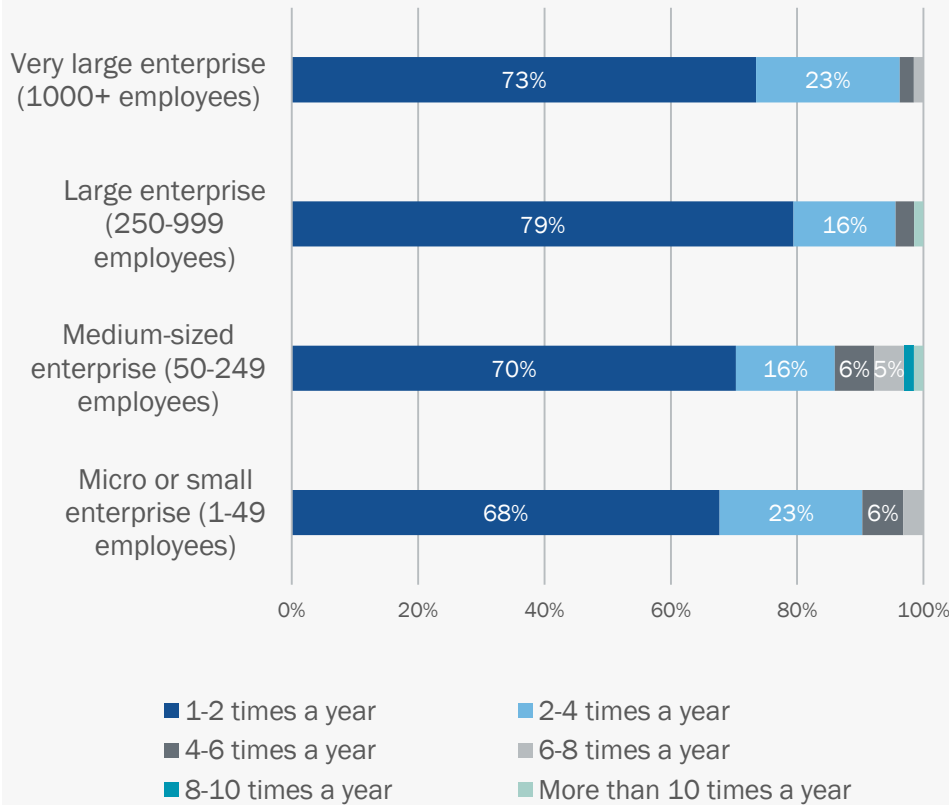
n= 443-464



n= 409-434

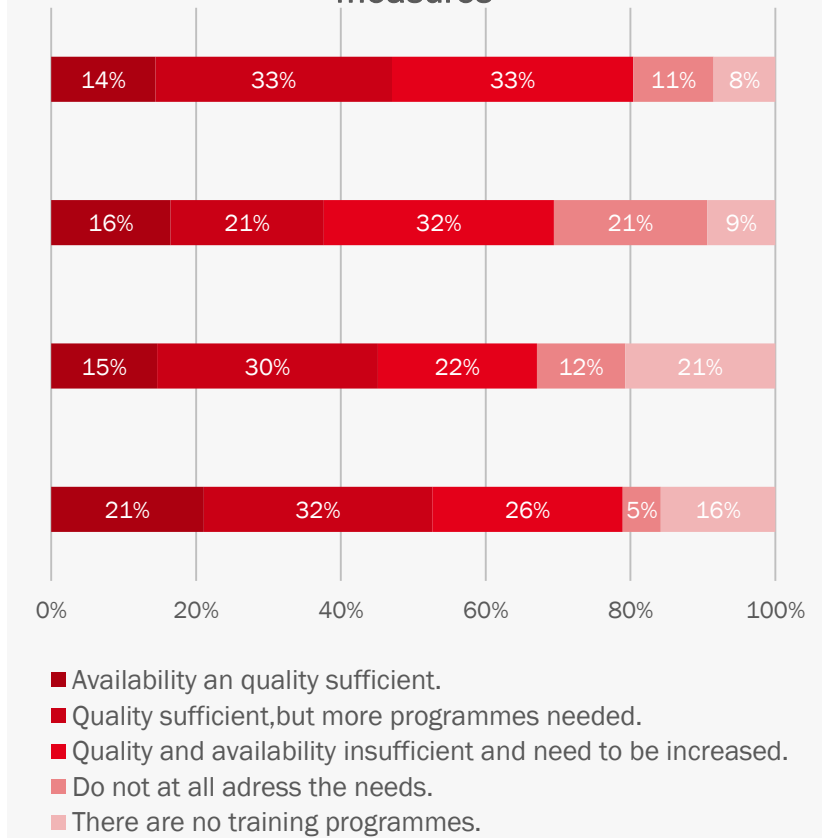
Participation and quality of training measures by company size

Participation in training measures (quantity)



MiE: n= 31 LE: n= 68
MdE: n= 64 VLE: n= 132

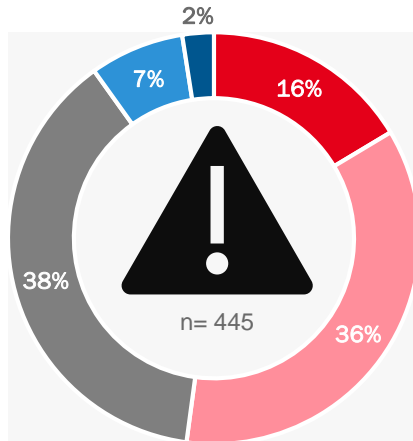
Availability and quality of training measures



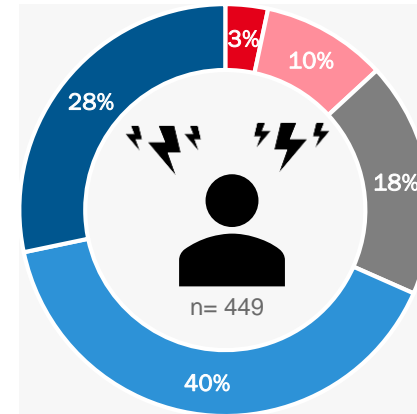
MiE: n= 38 LE: n= 85
MdE: n= 82 VLE: n= 153

Expected effect on the workforce's health – Hazardous tasks decrease as psychological stress increases

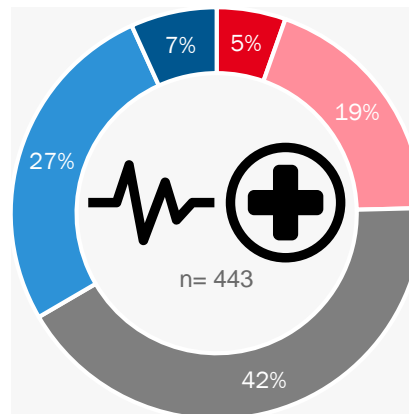
Effect on the number of hazardous tasks



Effect on the level of psychological stress



General health of employees



Decrease greatly

Decrease slightly

Stay the same

Increase slightly

Increase greatly



“One of the **risks** associated with digitalization and **permanent connection** is that workers may not be able to separate their working and personal lives. This can lead to **psychological stress** for employees.”

Industry Org. Representative

“The digital transformation will make companies more attractive and bring a more **motivated and engaged workforce**, with **younger generations** who are **digital natives** and where the new digital tools will help to create **better competencies** and **reduce routine work**. “

HR Manager

Very large basic chemicals company

It is important that workers have the **right to “switch off”** from their work. This is a subject that should be **address by companies**, but it also relays on **the ability of the employees** to have clear guidelines and be more autonomous to reduce stress.

Industry Org. Representative

“It is evident that technical skills and an understanding of digitalization will be needed. But **social skills, communication and creativity** are going to be very **important**. These are the kind of abilities that **can't be replaced** by any machine and that will be **necessary to drive these new trends**. ”

Industry Org. Representative

“Some **risks** are associated to the **lack of skilled workers**, since the job content will change towards **expert types** and more **versatile job roles**. Good **quality trainings** are **fundamental** to reduce the risk of job loss.”

HR Manager

Very large basic chemicals company

“Digitalization means a **cultural and a mindset change**. We need more **ICT skilled workers** in every area. **Blue collar workers** need to be able to understand the **digital tools**, have **analytical skills** and **multitasking abilities**.”

HR Manager

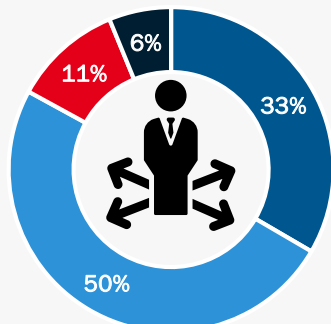
Very large basic chemicals company



Risk of reduction of the workforce in the following company divisions in the next 5 years

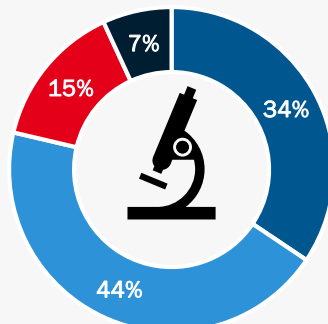


Management



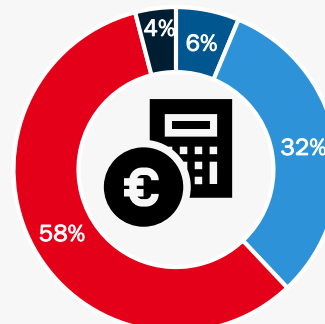
n= 452

Research & Development



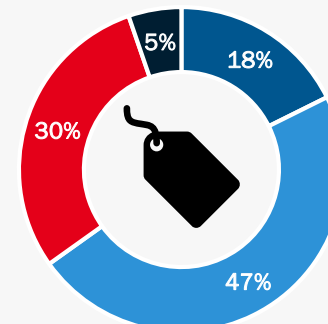
n= 436

Administration & Accounting



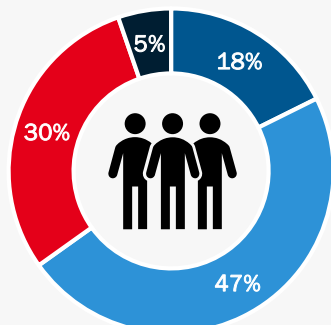
n= 445

Sales & Marketing



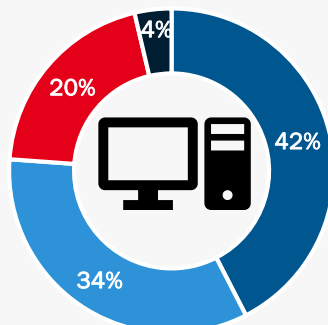
n= 433

Human Resources



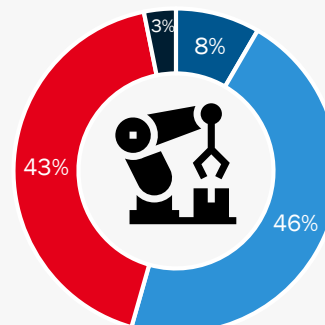
n= 436

IT - Services



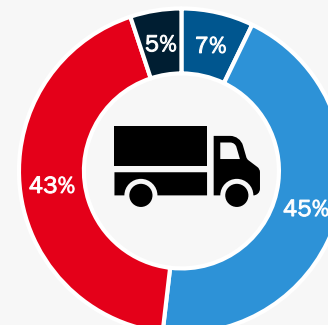
n= 436

Production



n= 441

Logistics



n= 432

No risk

Small risk

High risk

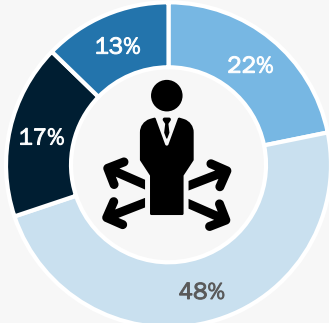
Don't know



New job opportunities in the following company divisions in the next 5 years

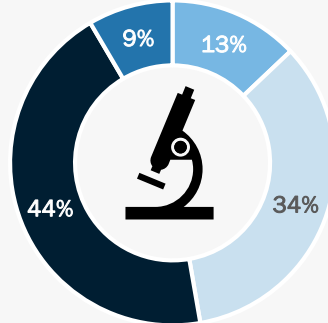


Management



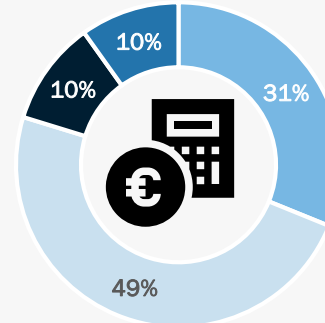
n= 408

Research & Development



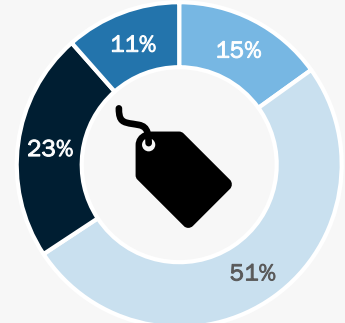
n= 402

Administration & Accounting



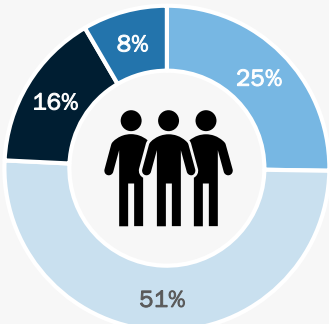
n= 395

Sales & Marketing



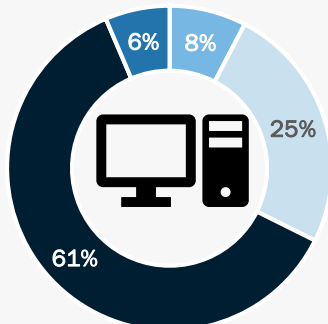
n= 391

Human Resources



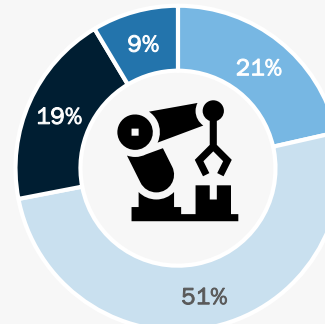
n= 392

IT - Services



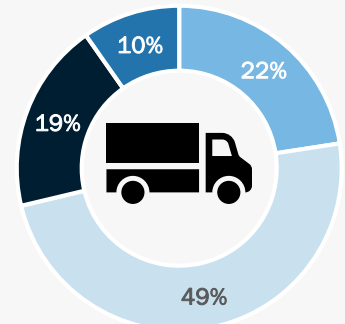
n= 405

Production



n= 396

Logistics



n= 390

No opportunities

Some opportunities

Many opportunities

Don't know



“The digital transformation will lead to an **increase in the number of more intellectual / analytical professions** at the expense of professions with rather simple execution tasks.”

HR-Manager

Large specialty chemicals company

“It is not a new development, but the **need for analytical skills** in e.g. our sales, marketing or controlling department **will further increase.** “

HR-Manager

Very large specialty chemicals company

“Our company is increasingly looking for the profile of **“bridge builders“**. The ability to work effectively together in teams to find solutions and to connect well with people and different cultures is becoming more important.”

Employee – Works Council member

Large basic chemicals company

“Job substitution is already happening, not **merely due to digitalization**. The industry needs other types of skills: self-determination, **result oriented**, creativity, **self and long-learning capacity**, to have different mindsets.”

Trade Union Representative

“Jobs in accounting and administration are clearly at the highest risk of substitution, while **R&D as well as IT-services will be growing**”

Facility manager

Large basic chemicals company

“In the future, much more **repetitive IT-tasks** like configuration work **will be outsourced** to external service providers. Internally, we will focus more on the development and improvement of the systems in place.”

Employee – Works Council member

Large basic chemicals company

“Digitalization brings **more flexibility** and may lead to more **work-life-balance**. But this comes **hand-in-hand** with more **self-leadership** and **autonomy**. Employees need to be more **autonomously responsible** in the management of their tasks.”

HR Manager

Very large basic chemicals company



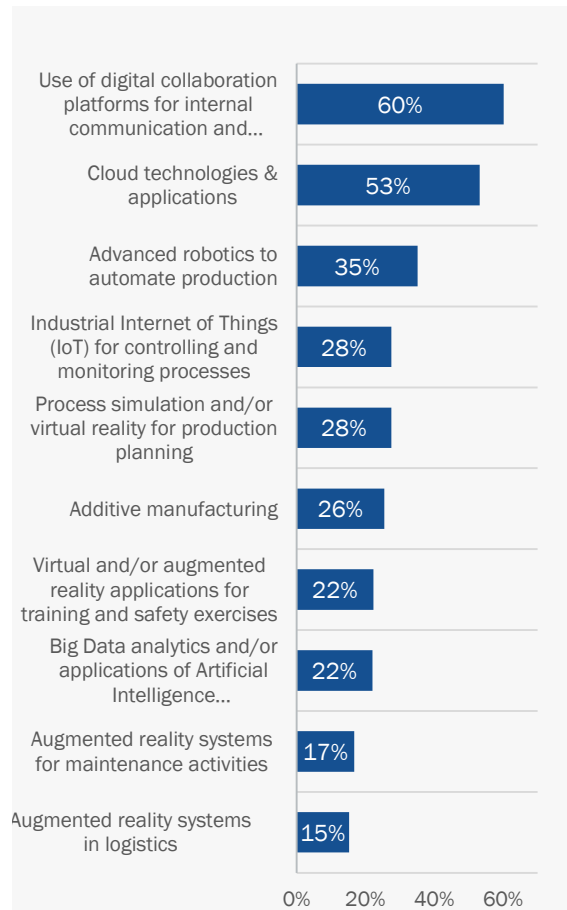
Technological transformation through digitalisation in the European chemicals, pharma, rubber & plastics sector

1st wave of technological transformation mostly accomplished 2nd wave driven by AI, process simulation & AR / VR

Which of the following digital technologies and approaches do you already use in your company/industry or do you plan to implement in future?



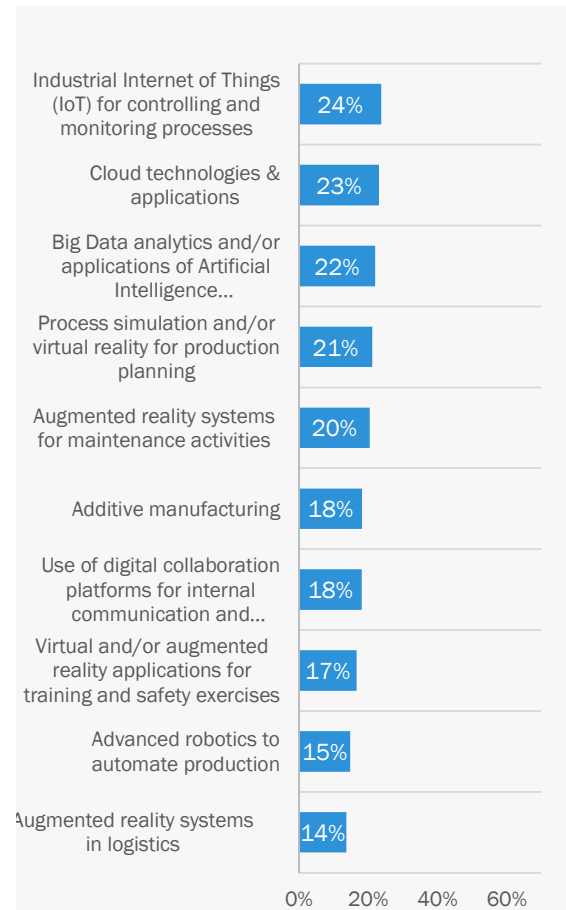
Currently used



n= 290-376



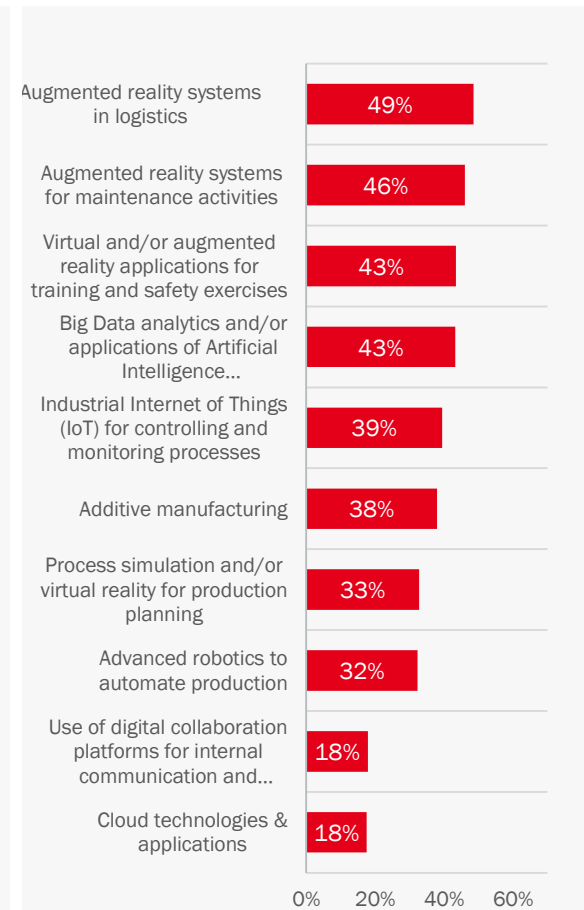
Currently tested



n= 290-376



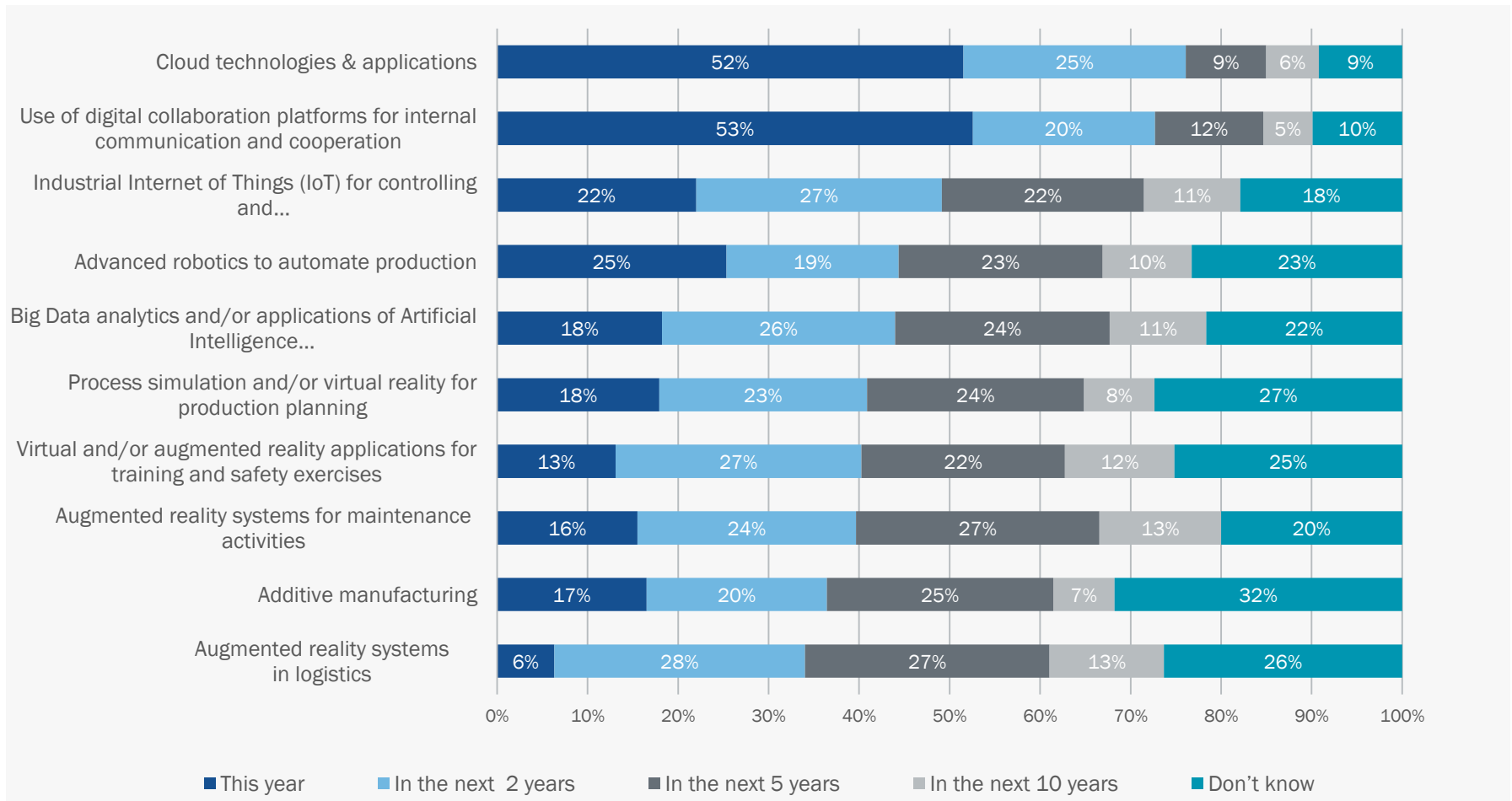
In the future



n= 290-376

2nd wave of digitalisation will largely come into effect in the next five years but differs across company size!

Please indicate the timeframe for the utilisation of the previously mentioned digital technologies (only if previously answered “currently tested” or “in the future”)



n= 236-298



“We flirted with virtual reality applications but there have been no concrete actions until now. **At the moment we are focussing much more on ‘front-end’ innovations** to improve the experience of our customers.”

Employee – Works Council member
Large basic chemicals company

“We are increasingly **working** together in **international teams. Without the digitisation, this wouldn’t be possible.**”

Employee – Works Council member
Large pharmaceuticals company

“**Big Data analytics** is a matter that is **mostly discussed within big companies** in the sector. Here the pharmaceutical sector is once again ahead. In Sweden, there is a lot of knowledge in this matter, but we don’t use it.”

Policy advisor – Manager representation

“**Strategic decision making** will increasingly be influenced by the analysis of large amounts of data. I **expect here a quite profound change due to artificial intelligence.**”

HR-Manager
Large specialty chemicals company

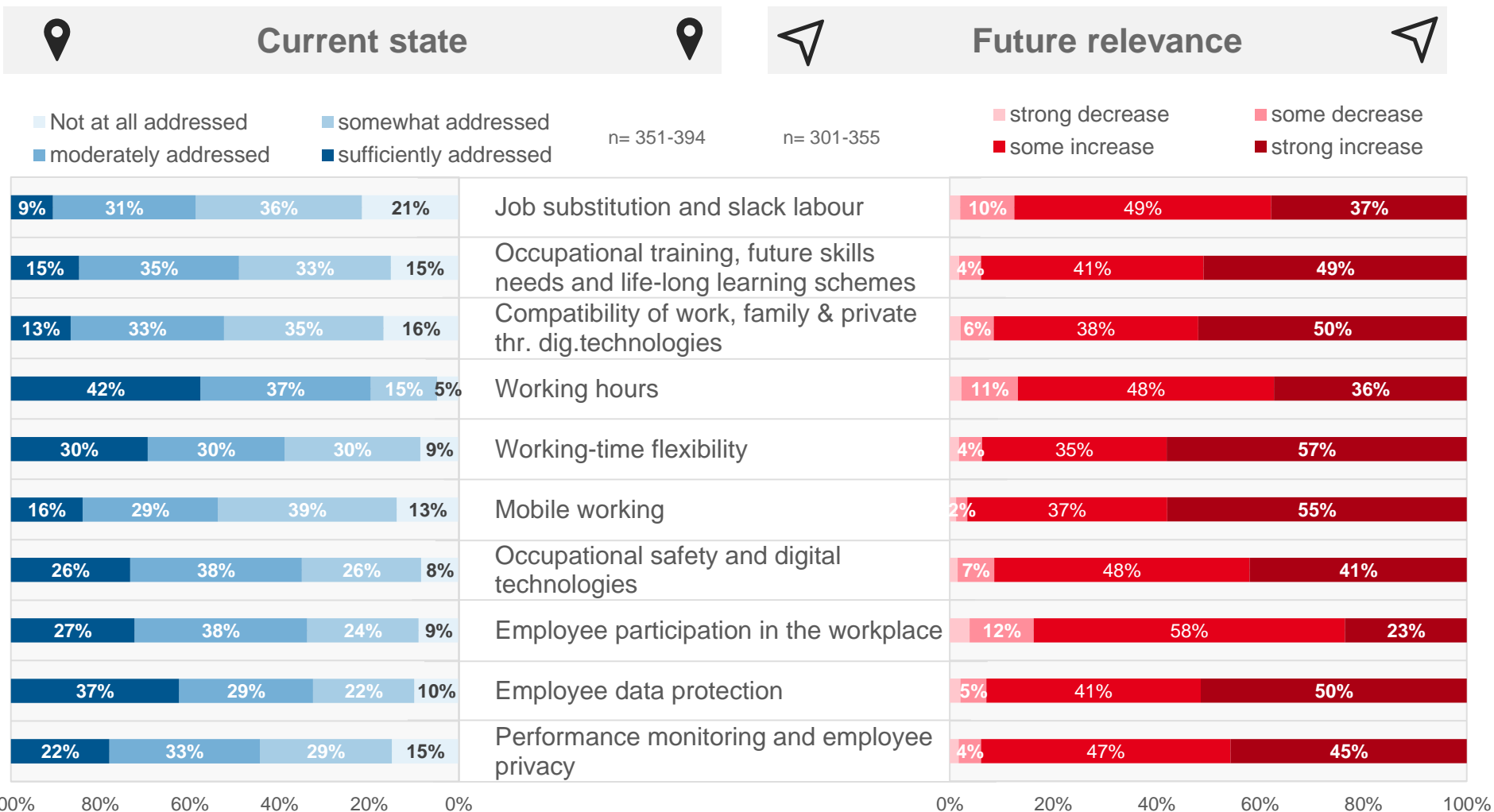
“**Big data will certainly affect us.** For example, it will enable preventive maintenance and in this way optimise the production processes. We already have some applications but they are not yet at the level that they should be. **It will still take a couple of years.**”

HR & Production manager
Large basic & petrochemicals company

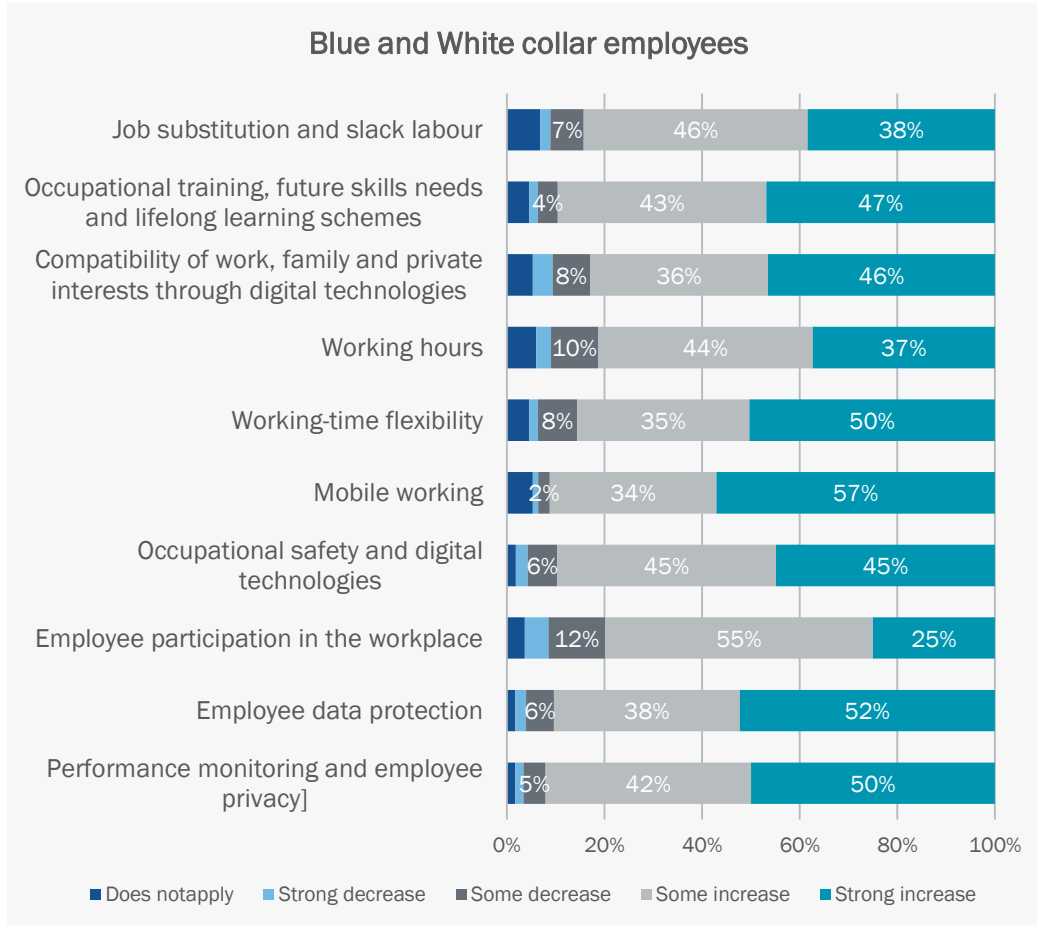


Employer-employee relationship and collective agreements

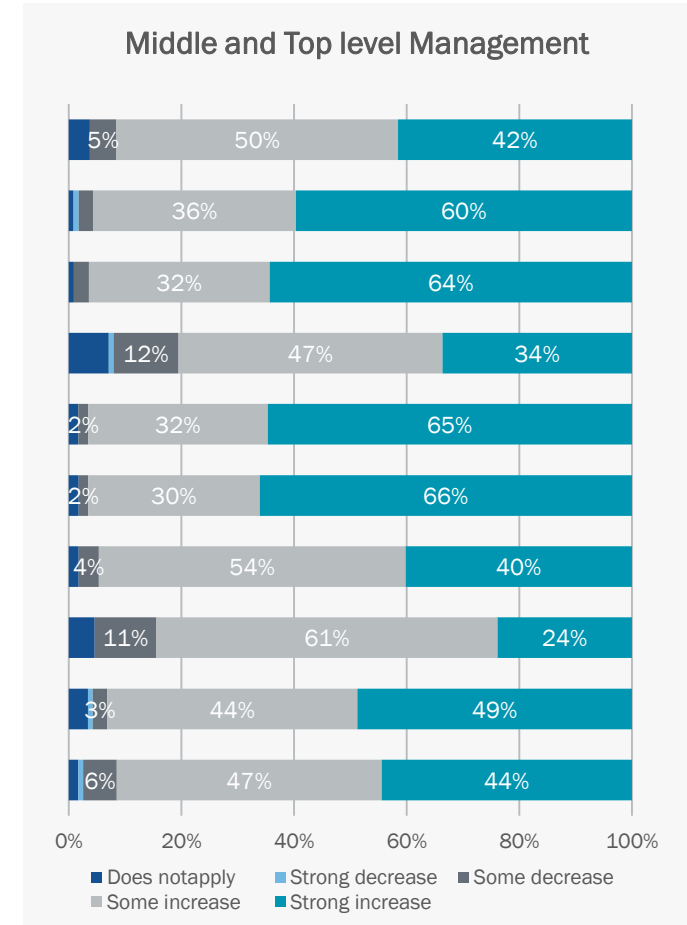
What aspects of the digital transformation are sufficiently addressed by collective agreements in your country & what will be their relevance in the next 5 years?



Future relevance across position in the company



n= 146-176



n= 106-117



“It is necessary to **involve employees** in this transformation process and make them participants. To make them **aware** that this is not a risk but **an opportunity and a transformation of work** and to understand that it **does not necessarily** lead to the **destruction** of jobs.”

Industry Org. Representative

“We have signed a collective agreement on the right to disconnect and there also exist a framework for mobile working. Such **frameworks are important and need to be fixed in the context of the digital transformation.**“

HR-Manager

Very large specialty chemicals company

“Having a strong **participation of the workforce** in the **decision making**, has helped to **increase the acceptance** of the digital transformation. Good levels of **communication** are fundamental to share with the employees the new possibilities of digitalisation.”

Manager Trade Union Representative

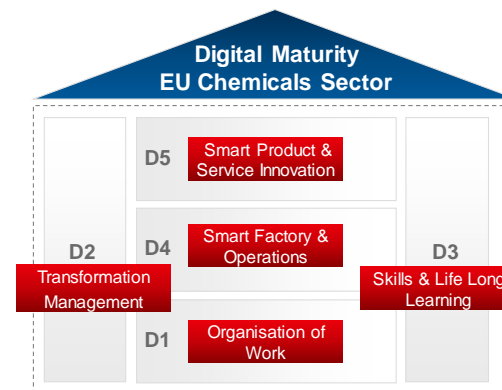
“Flexible and output-oriented work in network structures requires a certain **culture of leadership** which respects the right to disconnect.“

HR Manager

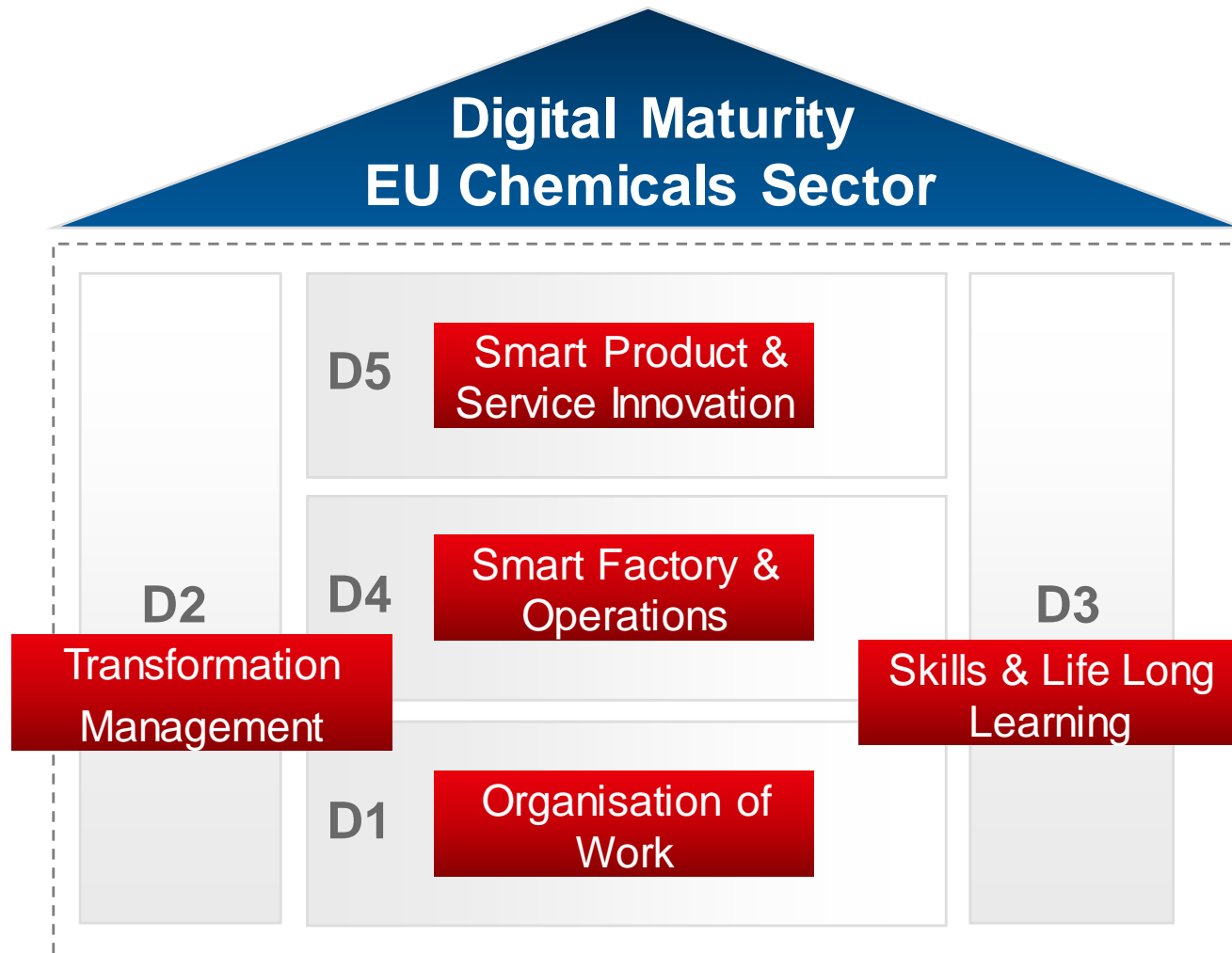
Very large pharmaceutical company



Level of digital maturity and awareness regarding digitalisation in the European chemicals sector



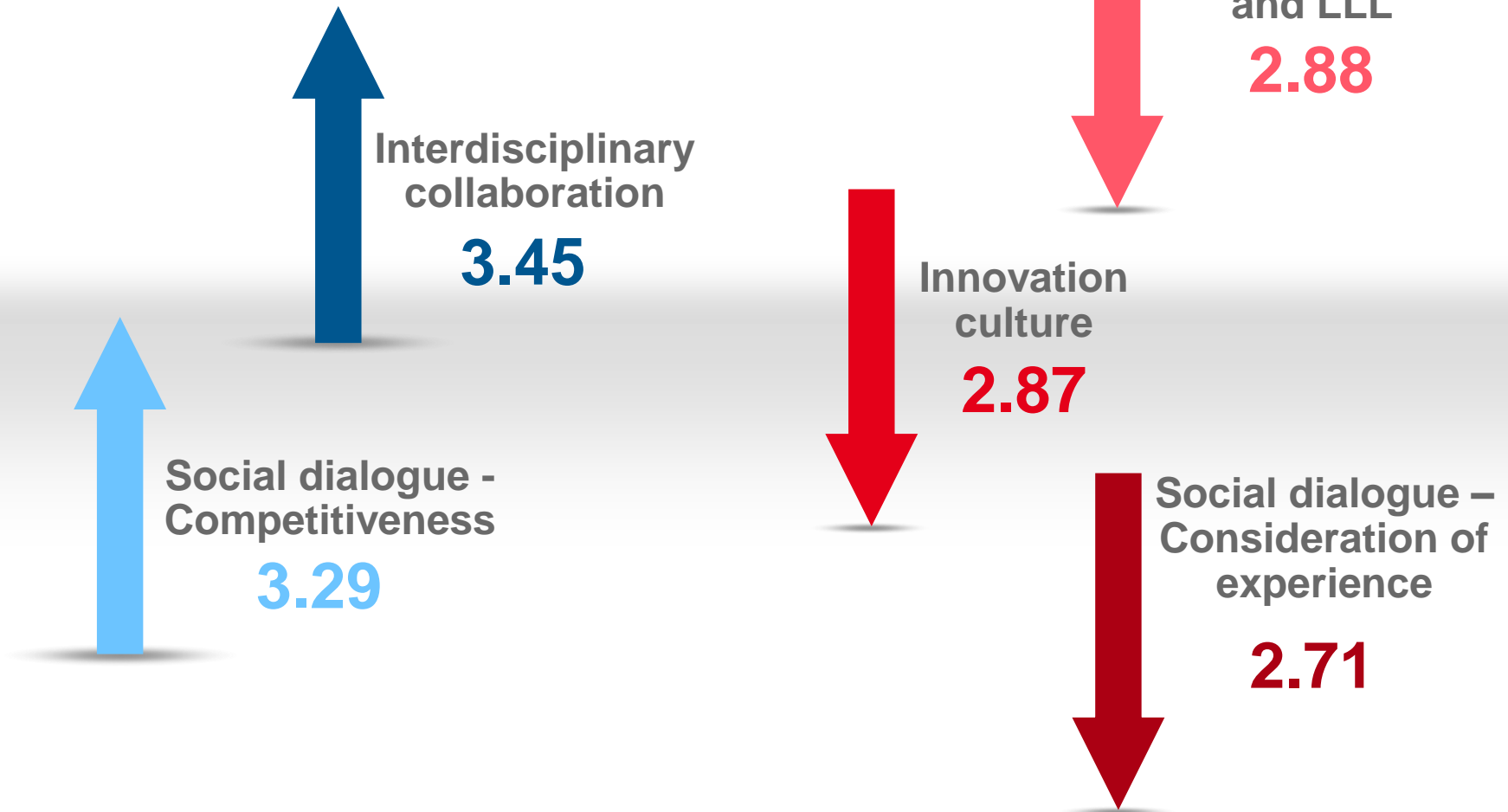
Dimensions of the maturity model



Overall, only moderate differences among chemical sectors with regard to digital maturity at average levels

	Dimension	BC	SC	PH	RP
	1 Skills & Life Long Learning	3.26	3.14	3.04	2.96
	1.1 Availability of digital skills	3.32	3.07	3.12	3.02
	1.2 Openness to new digital technologies	3.28	3.22	3.19	3.06
	1.3 Development of digital expertise	3.32	3.28	3.16	2.90
	1.4 Role of social dialogue	3.14	2.98	2.68	2.83
	2 Organisation of Work	3.18	3.22	3.12	3.01
	2.1 Flexibilisation of work - Flexible time-management	2.98	3.13	3.07	2.81
	2.2 Flexibilisation of work - Availability of infrastructure	3.32	3.35	3.41	2.89
	2.3 Interdisciplinary collaboration	3.44	3.39	3.68	3.35
	2.4 Social dialogue– Consideration of experience	2.92	2.83	2.59	2.78
	2.5 Social dialogue – Improvement of acceptance	3.05	3.20	2.86	2.95
	2.6 Social dialogue – Competitiveness	3.35	3.44	3.14	3.30
	3 Digital Transformation Management	3.22	3.04	2.90	2.93
	3.1 Digital Transformation Strategy	3.35	3.19	3.14	3.02
	3.2 Transformation Management	3.16	3.03	2.80	2.90
	3.3 Innovation Culture	3.15	2.89	2.75	2.86
	4 Smart Production & Operations	3.18	2.93	3.03	3.11
	4.1 Smart Production & Maintenance – Degree of automation	3.12	2.75	2.87	2.98
	4.2 Smart Production & Maintenance – Degree of flexibility	3.07	3.00	2.85	2.98
	4.3 Horizontal process integration	3.22	2.98	3.25	3.22
	4.4 Vertical process integration	3.30	3.00	3.14	3.23
	5 Smart Product & Service Innovation	3.08	3.07	3.05	2.99
	5.1 Smart products & services	2.93	2.89	2.99	2.95
	5.2 Smart business models	3.18	3.31	3.17	3.03
	5.3 Smart innovation management	3.12	3.00	2.98	3.00
	Total	3.18	3.08	3.03	3.00

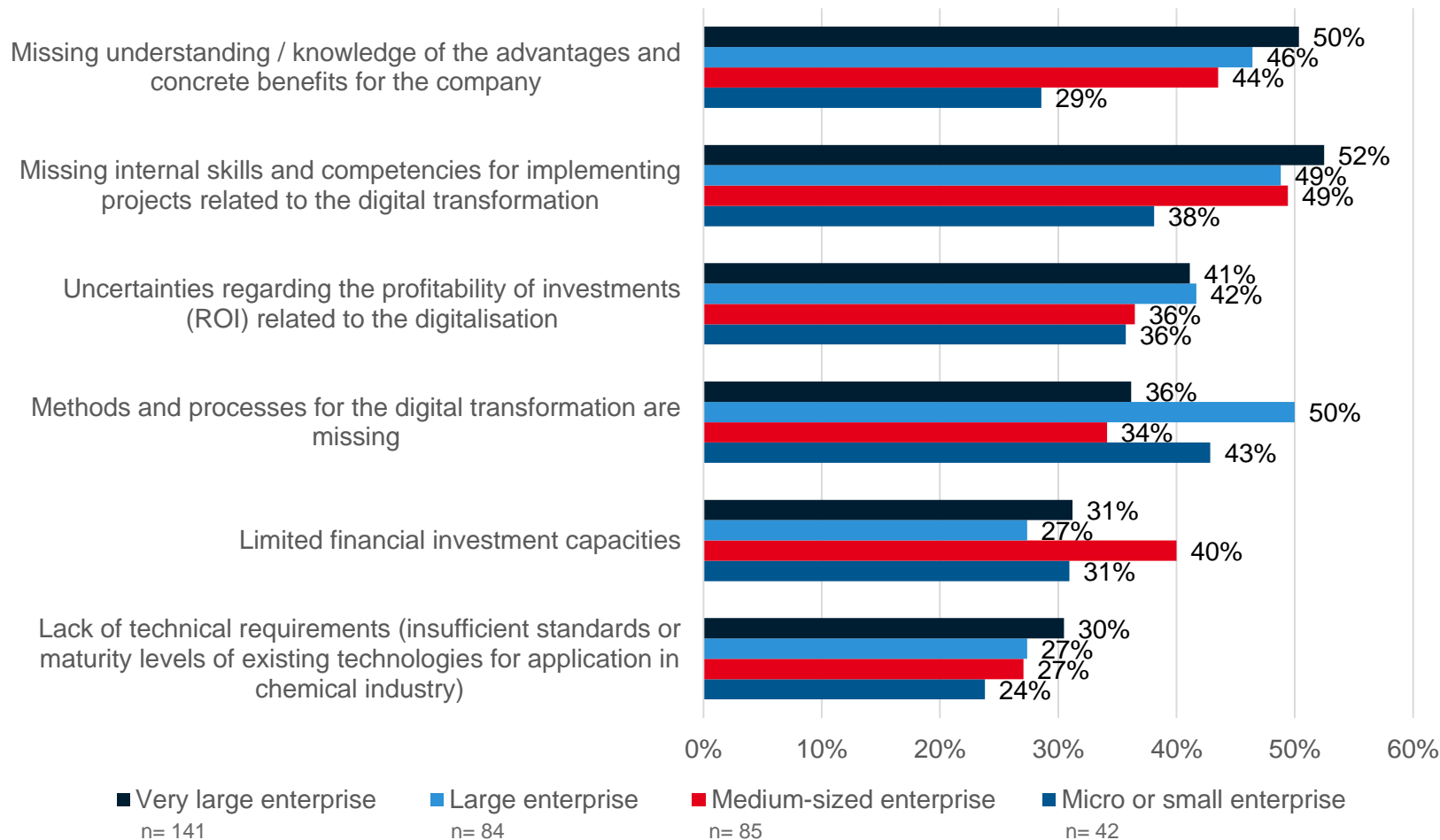
Highest and lowest scores across analysed indicators
(Highest possible score = 5)





Outlook: Biggest challenges for a successful digital transformation

In conclusion, what are the biggest challenges for a successful digital transformation of your company?





- 1. 1st wave of digital transformation** (i.e. digitizing analog data) and integrating cloud solutions is successfully accomplished
 - ➔ Only moderate disadvantages of micro & small companies
- 2. 2nd wave of digital transformation** will be driven by artificial intelligence, automation and augmented reality – and it will come into effect shortly
 - ➔ Transformation around **artificial intelligence** might cause more drastic implementation gaps between very large enterprises & SMEs
- 3. Skills shift clearly visible** – basic digital skills broadly existing, more advanced digital skills & transversal skills require attention by all stakeholders
 - ➔ Especially SMEs currently lack dedicated training programmes for digital upskilling and rate their digital skills less positive than larger firms!
- 4. Working environment** predominantly changed through mobile working with greater employee autonomy but increase of multi-tasking
 - ➔ Psychological stress is expected to be increasing significantly, esp. in larger firms!
- 5. Collective agreements** need to address more intensively the issue of mobile working & working-time arrangements as well as qualification while not forgetting about other sensitive issues (data protection, performance monitoring)
- 6. Change management** and the **involvement & support of employees** is currently the biggest challenge in the digital transformation process
 - ➔ Digital maturity shows little variance across MS, but challenges expected due to weaker transformation management competencies in Southern & Eastern Europe

**Thank you very much for
your time and interest!**

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Wir geben Orientierung.

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Wirtschaftsforschung und Strategieberatung.