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Evaluation and support of digitalisation of companies in Europe in times of the COVID-19 pandemic

Extended abstract for the ERSA 2022 Annual Conference

Justification and aims of the research

Digitalisation of companies refers to the process by which businesses are integrating digital technologies such as cloud computing, e-commerce, video conferencing into their practices. Understanding digitalisation is said to be increasingly crucial to appreciating how modern businesses operate and how they can be helped to find new ways of delivering value to customers, to prosper and grow (Henderson 2019, Williams et al. 2019). The process, closely related to the Industry 4.0 approach, is increasingly investigated as a research problem in management, economy (Hervas-Oliver et al., 2021), and economic geography due to the its unevenness between countries, regions, settlement systems and potential consequences between areas (Haefner, Sternberg, 2020).

The ongoing digitalisation of companies was suddenly interrupted by an unprecedented event at the beginning of 2020: the COVID-19 pandemic. The shocking scale of the disease and its consequences including lock-downs and health and safety requirements introduced by public authorities caused that firms around the World had to face problems with employees' attendance in the workplace and disturbances in production, value chains and logistics (Foss 2020, McKinsey 2020). The digital solutions – such as remote working, online meetings, e-commerce, were introduced to maintain business continuity, but possibly with differences in pace and scale between countries, regions and cities, considering their different initial innovativeness and digitalisation levels (World Bank Group, 2020; CoR, 2021).

Considering the abovementioned remarks, this research aims at answering the following questions: 1. Which aspects of digitalisation in companies, located in different types of European countries, accelerated during the COVID-19 pandemic?, 2. What role in digitalisation of companies in Europe during the COVID-19 played entrepreneurship of managers, national policies, activities of Digital Innovation Hubs?, 3. Which solutions utilising digital technologies introduced in the European companies to cope with the COVID-19 situation will still be used after the end of the pandemic?

Design/methodology/approach

The study is based on the online survey conducted among 124 experts in digitalisation from 22 European countries. The respondents represented Digital Innovation Hubs (88 answers) and national or regional administration units responsible for implementation of smart specialisation strategies in European countries and regions (36 answers).

The answers were first collected in October 2021, at the 19th edition of the European Week of Regions and Cities, an annual event organised by the EU Committee of the Regions (at sessions devoted to digital transformation). Then, in November and December 2021 the survey invitation was sent via e-mail to 1609 experts listed on the EU S3 Platform, in the sections on Digital Innovation

Hubs, European Digital Innovation Hubs and Smart Specialisations. Considering both ways of collecting survey answers, the overall response rate was 7,6%.

The survey questionnaire consisted of three main parts: 1) assessment of changes related to digitalisation, introduced in companies during the COVID-19 pandemic, 2) expected long-lasting effects of digital solutions, introduced in companies during the COVID-19 pandemic, 3) factors of and barriers to digitalisation of companies as well as most effective actions supporting the process.

The results were analysed for:

1) The total sample of respondents (124 answers from 22 countries, including 16 answers from Italy, 12 – Poland, 10 – Romania, 8 – Greece and Finland, 7 – Sweden and Spain, 6 – Austria, Portugal, France, Croatia, 5 – Germany etc.),

2) Respondents divided into representatives of the old EU member countries (EU-15, 60%) and new EU members with EU candidates (40%),

3) Respondents according to Innovativeness level counted by the EU National Innovation Scoreboard 2020 (INNO): 1 – innovation leaders (32%), 2 – strong innovators (35%), 3 – moderate innovators (19%), 4 – emerging innovators (14%) and

4) Respondents according to Digital Economy and Society Index (DESI): countries divided into 4 equal groups, depending on a place in the ranking: 1 – high (16%), 2 – over average (24%), 3 – below average (25%), low (35%).

In the analyses we used descriptive statistics (average, dominant) and chi-square tests (to check statistical differences between groups of countries).

Originality/value – This paper is one of the first comprehensive attempts to evaluate digitalisation paths in European companies in times of the COVID-19 pandemic. It is one of the first survey among panel of experts assessing possible long-lasting effects of the pandemic on digitalisation of companies. The knowledge of digitalisation barriers and effective actions overcoming these barriers may be important from the policy perspective.

Results – total sample, n=124

Tab. 1. Opinions on the digitalisation of companies during the COVID-19 pandemic and possible, long-lasting effects of the introduced changes.

X	Question (assessment on a 1-5 scale)	Avg.	D	(4+5) in%
X0	The Covid-19 pandemic accelerated the process of the digitalisation of companies in Europe	4,30	5	88,7
X1	The Covid-19 pandemic accelerated the digitalisation of manufacturing firms in my region (country)	3,52	3	50,8
X2	The Covid-19 pandemic accelerated the digital transformation of service firms in my region (country)	4,18	4	85,5
X3	The Covid-19 pandemic accelerated the process of adoption of network / software technologies (e-marketing, e-commerce, cloud solutions, online meetings software) in firms in my region (country)	4,40	5	89,5
X4	The Covid-19 pandemic accelerated the process of adopting product and process technologies with physical/digital interface (Industrial Internet of Things, robots) in firms in my region (country)	3,50	4	54,5
X5	Large firms (above 250 employees) in my region (country) are much more advances in terms of digitalisation than small and medium-sized enterprises	3,31	3	41,9
X6	The digital transformation during the Covid-19 pandemic was faster in large firms than in small and medium-sized enterprises in my region (country)	3,74	4	60,5
X7	Remote working (at least on some working days) will be standard in companies in my region (country) after the Covid-19 pandemic finishes	3,59	4	57,3
X8	Online meetings and online participation in conferences / events by employees (instead of attending all of them in person) will be standard in companies in my region (country) after the end of the Covid-19 pandemic	3,90	4	73,4
X9	The part of sales that was moved to the internet because of the Covid-19 pandemic will remain online afterwards	3,81	4	67,7
X10	Companies in my region (country) will shift to flexible workspaces after the end of the Covid-19 pandemic, resulting in the reduction of overall office space used	3,35	4	47,6
X11	Digitalisation will result in less business travel by company representatives from my region (country) after the end of the Covid-19 pandemic	3,91	4	72,6
X12	Digitalisation will result in less permanent, full-time employment (and more part-time workers or flexible collaborators) in companies in my region (country) after the end of the Covid-19 pandemic	2,93	3	25,0

Avg. – average value; D – dominant value; (4+5) in % – share of respondents who agree or strongly agree

Fig.1. The perceived growth in the digitalisation level of companies between 2019 and 2021 in respondent's country (the level for 2019 and 2021 was assessed on a 0-10 scale; results in %)

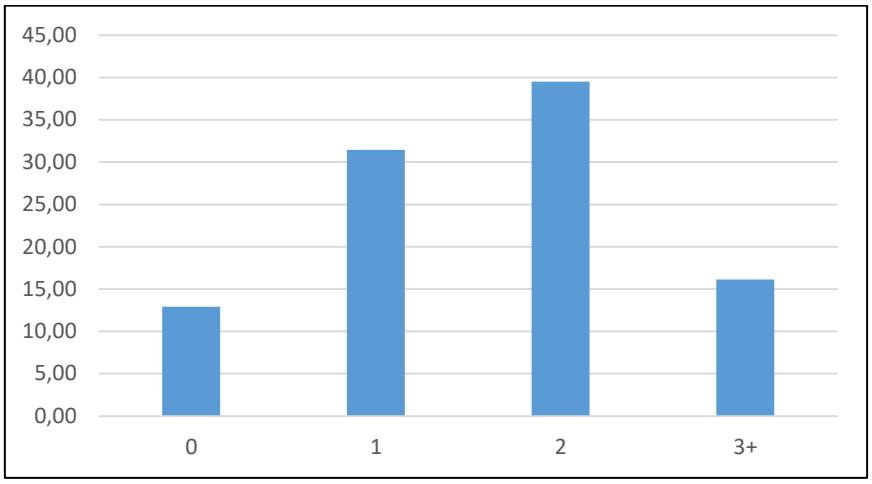


Fig. 2. Company departments in which digital technologies were increasingly adopted in respondent's country to address the COVID-19 challenges (multiple answers possible, results in %)

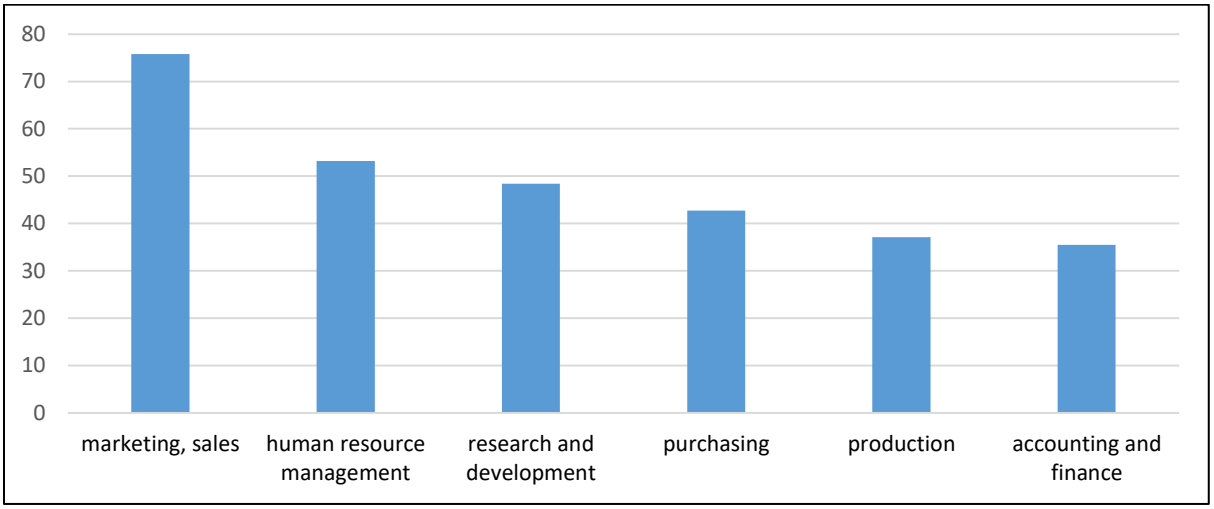


Fig.3. Factors that contributed most to the digitalisation of firms in respondent's country in the last 3 years (selection up to 3 most important, results in %)

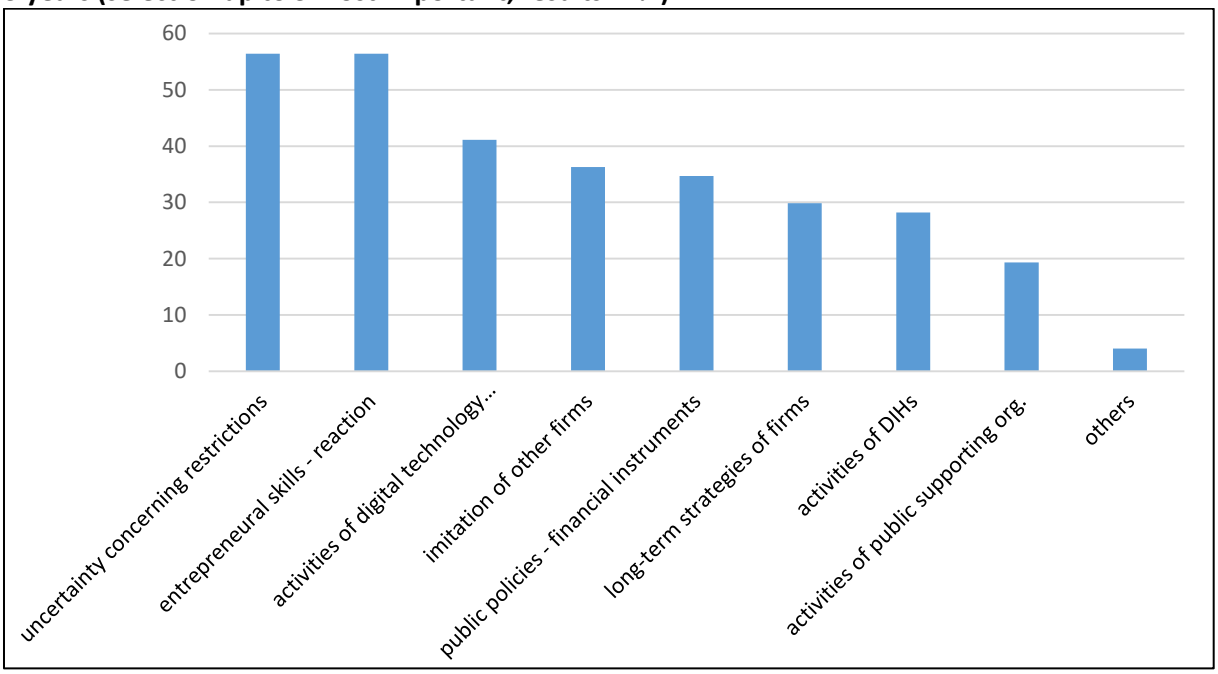


Fig. 4. The biggest barriers for the digital transformation of firms in respondent's country (selection up to 3 most important, results in %)

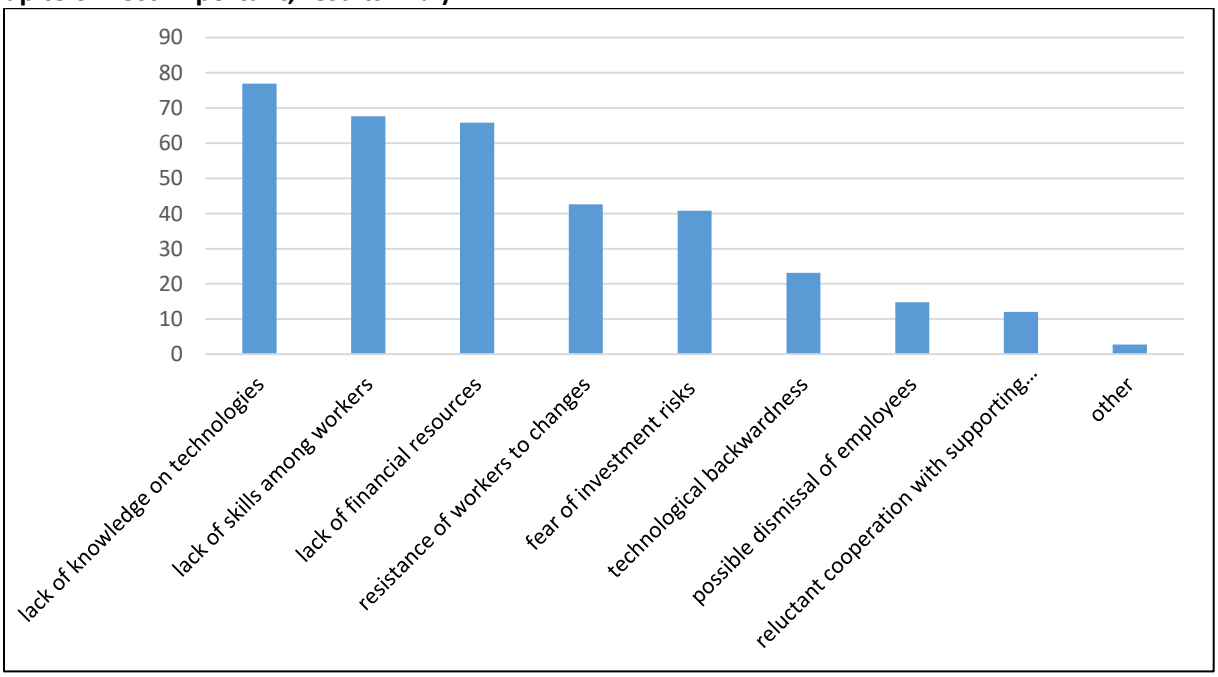
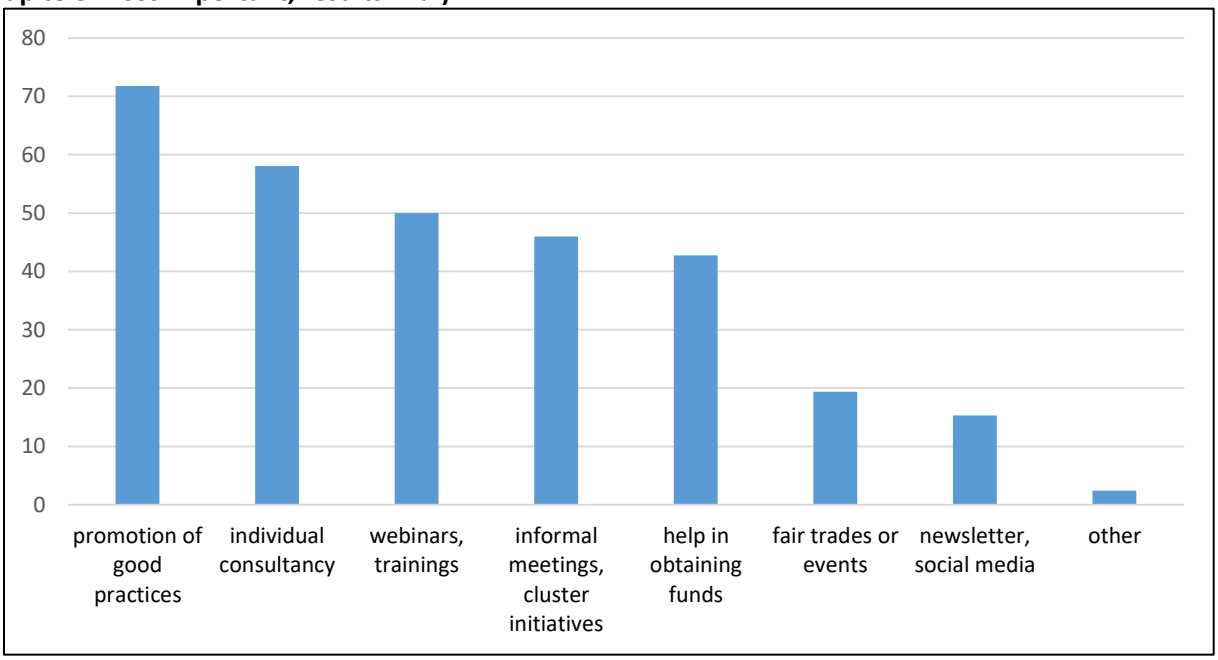


Fig. 5. Most effective actions supporting firms in digitalisation in respondent's country (selection up to 3 most important, results in %)



Results – differences between groups of countries

Tab. 2. Digitalisation during the COVID-19 pandemic – differences in quantitative assessments

	Type	Resp.	x1	x2	x3	x4	x6	x7	x8	x9	x10	x11	x12	D21.19
OLD NEW UE	1	74	3,53	4,24	4,39	3,53	3,39	3,65	3,85	3,69	3,35	3,78	2,86	1,40
	2	49	3,55	4,14	4,49	3,56	3,31	3,49	4,00	4,00	3,37	4,08	3,02	1,88
	All	123	3,55	4,21	4,44	3,55	3,34	3,59	3,90	3,81	3,35	3,91	2,93	1,59
	New EU countries													↑ *
INNO	1	39	3,59	4,18	4,49	3,61	3,26	3,41	3,95	3,92	3,28	4,05	3,05	1,92
	2	43	3,53	4,16	4,30	3,44	3,72	3,30	3,70	3,63	3,00	3,60	2,91	1,60
	3	23	3,35	4,26	4,57	3,61	3,26	3,91	3,96	3,83	3,57	3,96	3,13	1,32
	4	18	3,67	4,28	4,44	3,56	2,83	4,22	4,28	4,00	4,11	4,22	2,44	1,17
	All	123	3,55	4,21	4,44	3,55	3,34	3,59	3,90	3,81	3,35	3,91	2,93	1,59
	The ↑ the…							↑ *			↑ *		↓ **	
DESI	1	43	3,37	4,21	4,30	3,44	3,42	3,23	3,79	3,60	3,12	3,79	3,02	1,81
	2	30	3,77	4,07	4,50	3,52	3,40	3,50	3,80	3,97	3,10	3,83	2,90	1,70
	3	30	3,43	4,27	4,47	3,63	3,47	3,80	4,03	3,90	3,50	3,97	3,07	1,21
	4	20	3,70	4,30	4,55	3,65	3,00	4,15	4,15	3,90	4,05	4,15	2,55	1,50
	All	123	3,55	4,21	4,44	3,55	3,34	3,59	3,90	3,81	3,35	3,91	2,93	
	The ↑ the…							↑ *			↑ ***		↓ **	

Significance of differences * p<0,5 ** p<0,1 *** p<0,01

Tab.3. Digitalisation during the COVID-19 pandemic – differences between groups of countries in quantitative assessments

	OLD NEW EU	INNO	DESI
Barriers	In the new EU countries lack of funding and resistance to change are given as more important barriers than in the old EU countries	The higher innovativeness, the higher barrier is seen in lack of skills and the smaller barrier is seen in technological backwardness	The higher the DESI, the smaller barrier in technological backwardness and the smaller fear that digitalisation will lead to possible dismissal of employees
Factors	In the new EU countries higher role of: uncertainty with restrictions, entrepreneurship of managers and external financial support; and smaller role of long-term strategies, imitation of others and activity of DIHs	The higher innovativeness, the larger perceived role of DIH and the smaller importance of uncertainty with restrictions	The higher the DESI, the smaller importance of uncertainty with restrictions
Actions	In the new EU countries more important are seen external financing, less important promotion of good practices and webinars	The higher innovativeness, the less important external financing and newsletter	The higher the DESI, the less important external financing and newsletter and the more important informal meetings
Departments	In the new EU countries larger changes in marketing and sales and smaller in accountancy; smaller changes in production and R&D	The higher innovativeness, the larger changes in HR management and smaller in marketing and sales	The higher the DESI, the larger changes in HR management

Selected conclusions:

- The Covid-19 pandemic lead to the acceleration of the digitalisation of companies in Europe. The process is perceived to have been faster in companies rendering services (than in manufacturing ones) and larger in terms of size. According to the study, most commonly introduced were the newest software technologies allowing online meetings, remote work and e-commerce.
- Online meetings and reduction in business travel are believed to become a universal in Europe, long-lasting effects of digitalisation of companies in times of the COVID-19 pandemic. In countries characterised by high innovativeness level and high value of the Digital Economy and Society Index (DESI) additional long-lasting effects will probably include popularisation of remote working (at least on some working days) and flexible workspaces. Both of these may lead to the reductions in the overall office space used.
- There are differences in the perceived barriers of digitalisation, factors that contributed to digitalisation during the COVID-19 pandemic and most effective actions supporting digitalisation between groups of European countries, especially between old-EU countries (EU-15) and new-EU countries with EU candidates.

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