How is the digital transformation changing demand for skills in apprenticeships-typical occupations?

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Introduction

- Digital and technological advancements are rapidly changing the world of work, with the potential of creating new opportunities for workers across the globe.

- To unlock these opportunities, education provision needs to adapt so that people can learn the right skills to meet business needs.

- This paper uses big data from Lightcast job postings to understand how the digital transition is affecting demand for skills in occupations typically accessed via an apprenticeship or vocational route in five different European countries: **France, Germany, Italy, Spain and the UK**.

- The aim of the paper is to provide a clear overview of the type of digital skills that vocational education needs to equip people with to help them succeed in today's labour market.

Methodology (1)

JOB POSTINGS DATA

DATA SOURCES

- Lightcast proprietary data

- Billions of job postings scraped daily from thousands of online job boards, newspapers and employers sites

- Cleaned, deduplicated and categorised.

TIME FRAME

- Job postings data allows to capture almost-real time insights from the labor market

- The analysis presented in this paper is based on 2022 data

- 2019 is the year selected to look at change over time.

SAMPLE QUALITY

- Only captures job postings that have been published online.

- This works best for professional services jobs - less so for others, such as agriculture.

- Quality of the data is based on what employers mentioned in the postings. Some things may be taken for granted.

Methodology (2)

LIGHTCAST OPEN SKILLS TAXONOMY
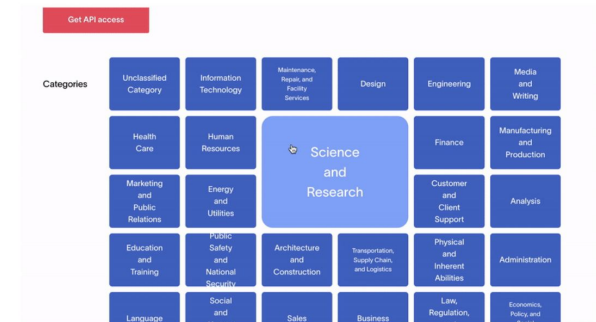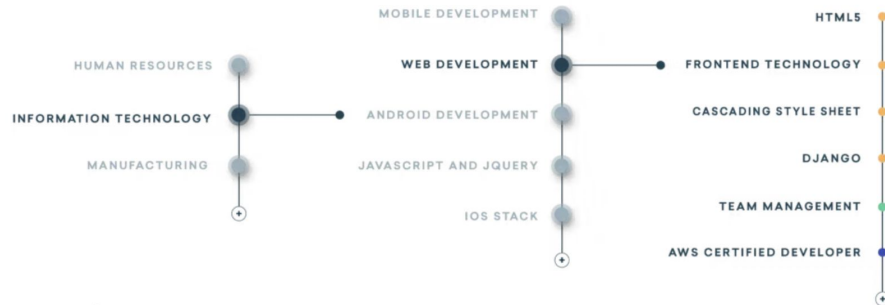
OVER 32,000 SKILLS

- Granular classification
- Regularly updated

SPLIT INTO 3 CATEGORIES

- Common skills
- Specialised skills
- Software skills

ORGANISED HIERARCHICALLY

- 32 thematic skills categories
- 400 skills subcategories

Methodology (3)

DIGITAL SKILLS

- To define digital skills this paper starts from Lightcast Open Skills Taxonomy, a taxonomy with 32,000+ skills taken from online job postings.

- It identifies 12,000 digital skills encompassing a wide range of skills clusters: from basic digital tools ('Excel') to advanced programming languages ('Python'), to skills and abilities necessary to use these tools ('Computer literacy') and competencies that rely on digital tools to be carried out ('Data analysis').

- The paper then applies the international **e-Competence Framework (e-CF)** skills standard to distinguish digital skills on five dimensions: **(1) Build, (2) Enable, (3) Plan, (4) Run and (5) Manage.**

Category	Skill	e-CF
Computer Science	Algorithm Analysis	Build
Digital Design	3D Computer Graphics	Plan
Drafting and Engineering Design	2D Computer-Aided Drafting And Design	Plan
Office and Productivity Equipment and Technology	Spreadsheets	Run
Scripting Languages	Python (Programming Language)	Build

Methodology (4)

COUNTRIES AND OCCUPATIONS SELECTION

France, Germany, Italy, Spain and the United Kingdom

Chosen using the following criteria:

1. Data quality and availability → robustness of the research

2. Differences in apprenticeship systems → breath of the application of the findings

3. Country size → coverage of the findings

Healthcare, Construction and Manufacturing

Chosen using the following criteria:

1. Role that apprenticeships and vocational training play in entering occupations relevant to the sector → relevancy of the findings

2. Labour market representativeness → breath of the application of the findings

3. Data quality and availability → robustness of the research

Findings

The impact of digitalisation on recruitment activity

Figure 2.   **Demand for digital skills over time**
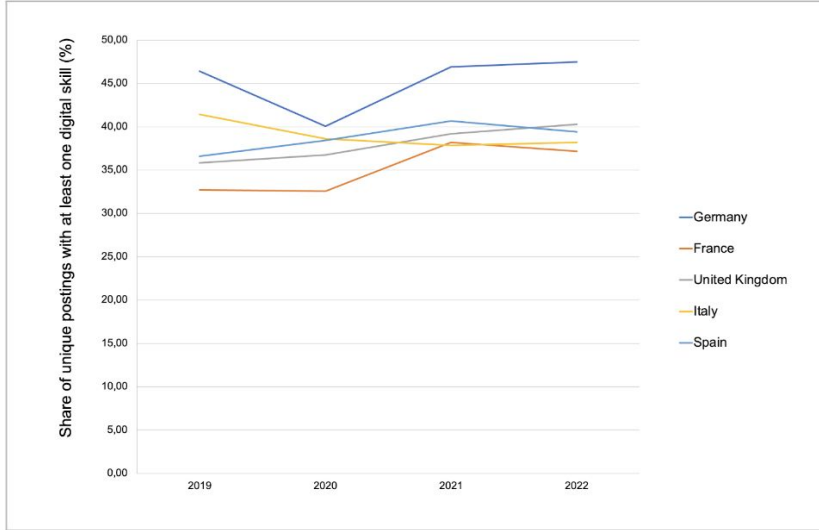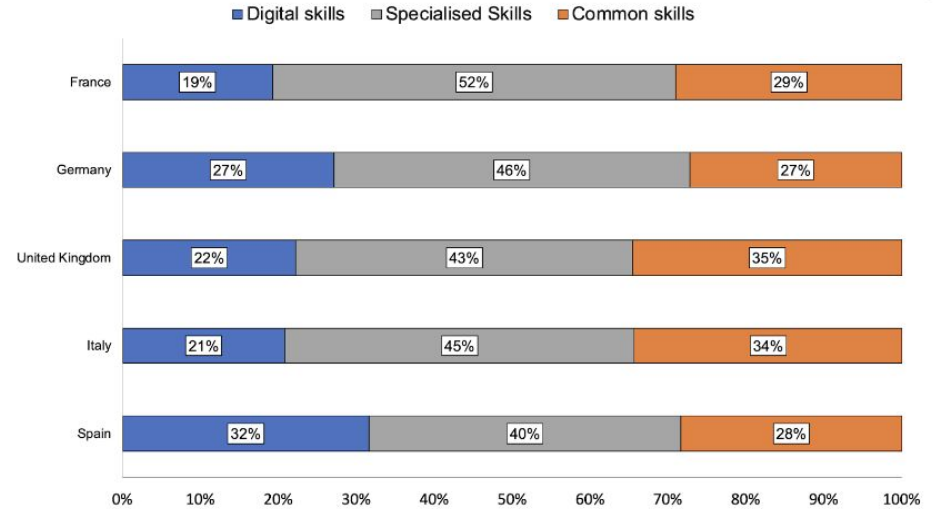Job postings requiring at least one digital skills | 2019-2022 | (%)

Source: Lightcast, Job postings data.

Figure 3.   **Skills degree in job postings**
2022 | (%)

Findings

The fastest growing and declining digital skills

- Digital skills related to the **field of computer science and programming languages** are growing fast.

- High churn in the specific tools - such as programming languages - being mentioned. This means that **flexibility to learn is more important than the specific tools** to learn.

- **Fastest declining skills are associated with more basic knowledge of digital technologies.** This may suggest these skills are **becoming implicit** and employers no longer need to mention them in job postings.

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Figure 5.   **Fastest growing and fastest declining digital skills**
France, Germany, Italy, Spain and United Kingdom | 2019 - 2022 | (%)
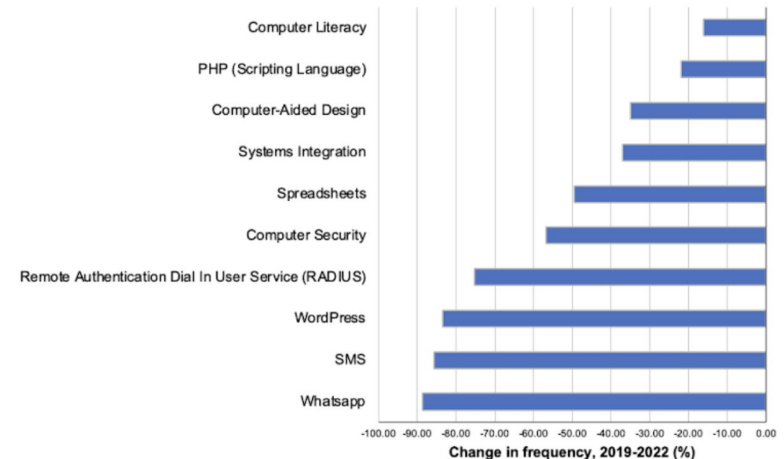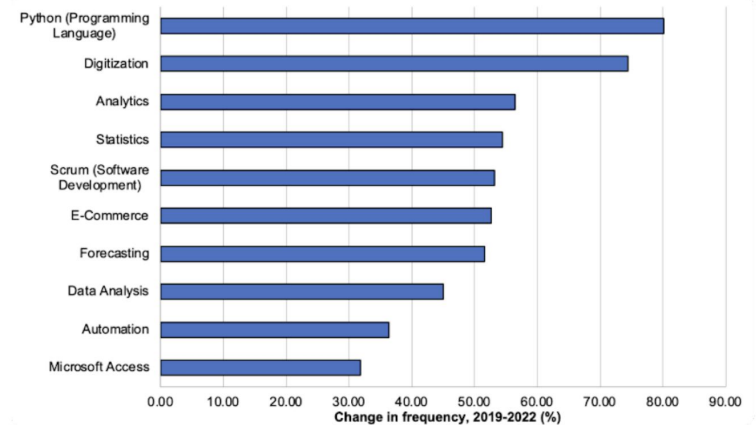
Findings

Demand for digital skills within apprenticeship-reliant occupations in three sectors
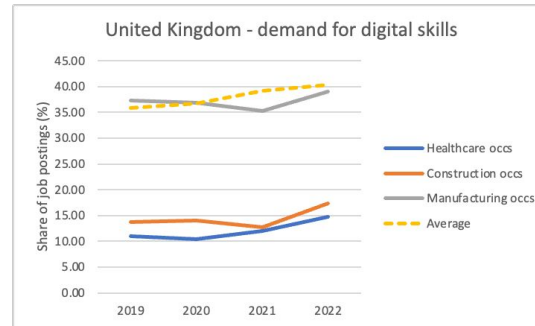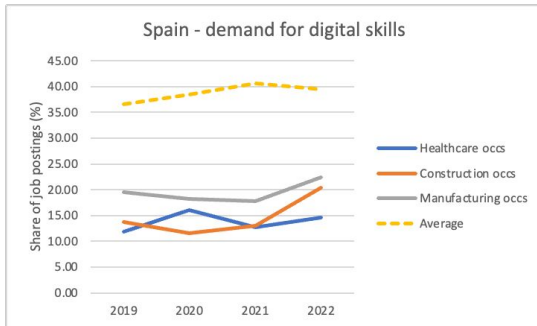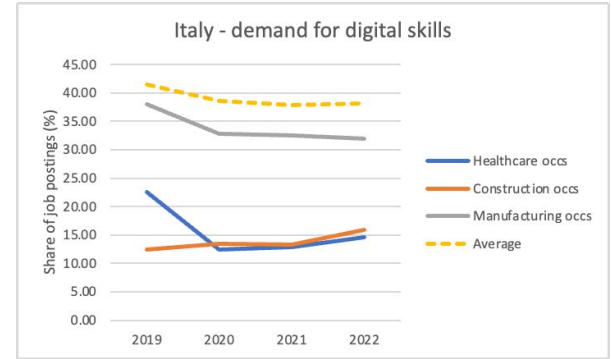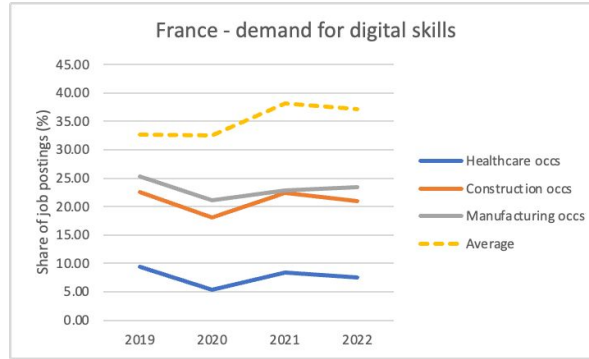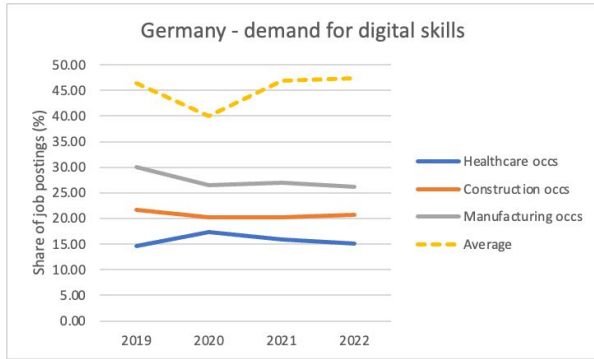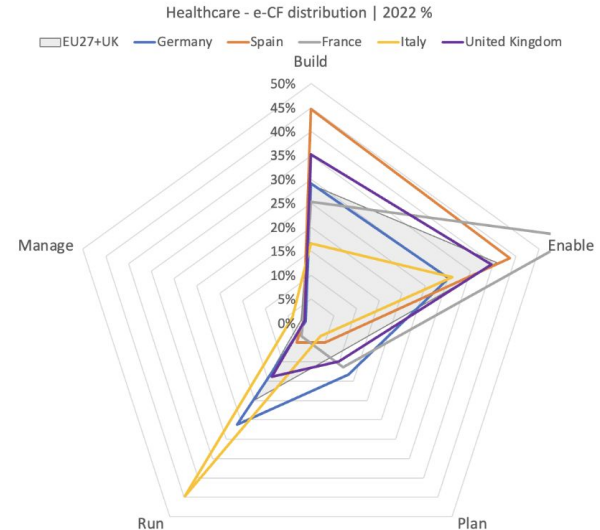
Findings

Healthcare-related occupations

Most in demand digital skills in healthcare-related occupations
France, Germany, Italy, Spain and United Kingdom | 2022 | (%)

Digital skills	Frequency (%)
Record Keeping	1.1
Computer Literacy	0.9
Microsoft Excel	0.5
Microsoft Outlook	0.5
Decision-Making Software	0.4

Digital skills required in healthcare-related occupations are linked to better **enabling, building and running of healthcare systems**.

In Run segment there is a prevalence of skills for managing day-to-day tasks such as spreadsheets and communication tools.

Figure 8. **e-CF Analysis for healthcare occupations**
France, Germany, Italy, Spain and United Kingdom | 2022 | (%)

Source: Lightcast, Job postings data.

Findings

Construction-related occupations

Most in demand digital skills in construction-related occupations
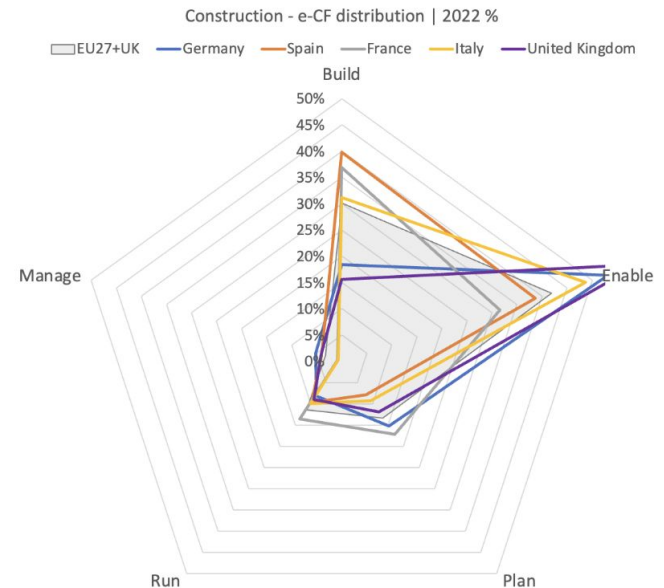France, Germany, Italy, Spain and United Kingdom | 2022 | (%)

Digital skills	Frequency (%)
Microsoft Office	0.87
Personal Computers	0.56
Telecommunications	0.56
Microsoft Excel	0.42
Automation	0.39

Enable > geospatial engineering and automation

Build > networking and telecommunications, including antenna, fibre optics, cabling, network devices

Plan > home automation and Building Information Modeling

Figure 11. **e-CF Analysis for construction occupations**
France, Germany, Italy, Spain and United Kingdom | 2022 | (%)

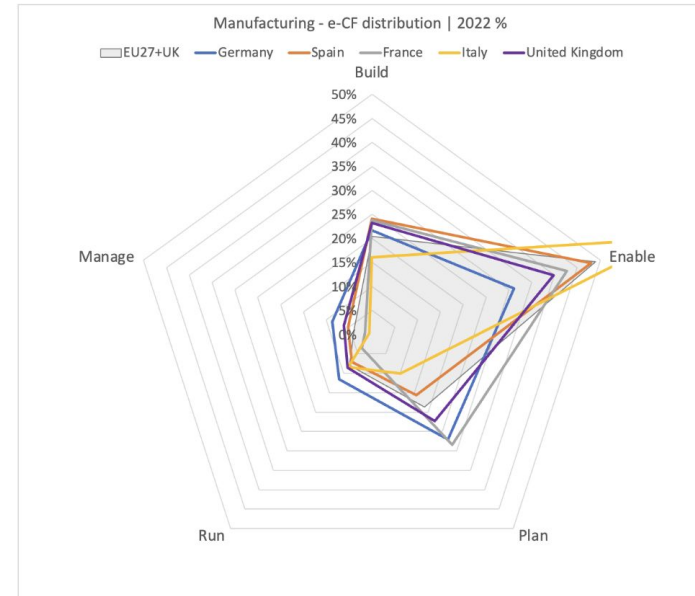*Source*: Lightcast, Job postings data.

Findings

Manufacturing-related occupations

Most in demand digital skills in manufacturing-related occupations
France, Germany, Italy, Spain and United Kingdom | 2022 | (%)

Digital skills	Frequency (%)
Microsoft Office	2.88
Personal Computers	1.67
Automation	1.25
Computer-Aided Design	1.20
Systems Engineering	1.13

The analysis reveals the significance of the Enable and Plan segments. Proficiency in i**ndustrial automation, CAD/CAM systems, and numerical control machines** is critical for these occupations within the Enable segment. The Plan segment highlights the sector's transformation through the incorporation of **artificial intelligence**, coupled with **industrial automation via machine learning and computer vision systems.**

Figure 14. **e-CF Analysis for manufacturing occupations**
France, Germany, Italy, Spain and United Kingdom | 2022 | (%)

Source: Lightcast, Job postings data.

Conclusions

Implications for policy-makers and next steps for research

- The digital transformation has already affected the labour market, with increased demand by employers on digital skills.

- Demand is evolving over time:
    1. From basic to more advanced digital skills → more advanced training needed
    2. From one specific tool to another → learning how to learn and adapt to the labour market is equally, if not more, important than learning the actual tools

- There is variation across sectors:
    1. Health: lower digital demand than other sectors, but **digital admin tools and digital medical devices is important.**
    2. Construction: undergoing significant change, with **digital skills changing the way we build and what we build.**
    3. Manufacturing: higher demand and higher complexity required than the other two sectors. Particular emphasis on **collaborative robots, AI, machine learning and automation.**

Thank you. Any questions?

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