

SKILL COMPLEMENTARITIES IN THE UK

We describe in the table below complementary and anti-complementary O*NET features for UK sub-major occupation groups.

Take Customer Service and Sales Occupations, for example, which according to the model are likely to see a fall in future demand. According to the O*NET data, Customer and Personal Service, Oral Comprehension and Oral Expression are the three most important features for this group. Our model predicts that increasing Judgment and Decision-Making, Fluency of Ideas, and Originality in the presence of these features will have the greatest positive impact on future demand, while increasing Public Safety and Security, Law and Government, Operation and Control, Engineering and Technology and Reading Comprehension will have the greatest negative impact.

Judgment and Decision-Making, Fluency of Ideas, Originality and Operations Analysis appear regularly across all occupation groups and present an illustrative case where changes in organisational design may be required to take advantage of them. Without enhanced delegation of formal authority and employee involvement in decision-making and the generation of ideas, the productivity gains from investing in these skills are likely to be modest. This is supported by a large body of evidence on the role and complementarity of high-performance work practices (Ben-Ner and Jones, 1995; Kruse et al., 2004; Lazear and Shaw, 2007). Decentralization, and the organisational structures and skills that support them, appear particularly important for firms closer to the technological frontier, firms in more varied environments, and younger firms (Acemoglu et al., 2007). The UK ranks around the OECD average in terms of the share of jobs that employ these practices, though the level of task discretion, defined as employees' immediate control over their work tasks has fallen sharply since the 1990s (Inanc et al., 2013; OECD, 2016d).

Science – defined here as the capacity to use scientific rules and methods to solve problems – is another cross-cutting complement. We find it to be a complementary feature not only among prototypical high-skill occupations but also Secretarial and Administrative occupations. Mastery of medium-skill science is already indispensable to a number of paraprofessional positions – from radiology technicians to electricians (Rothwell, 2013; Grinis, 2017). Our results suggest that clerical occupations may be ripe for a similar transformation. One can envisage scenarios where this is possible – for example, the credit controller occupation that increasingly applies aspects of data science to help investigate the credit worthiness of borrowers and collect arrears of payment.

Of course, any reconfiguration of skills, abilities, and knowledge requirements entails an evolution of the occupation. Or, put differently, occupations may need to be redesigned in order to make effective use of skills and knowledge complements. It is our hope that the results presented below will be a useful guide in this exercise in the UK.

For UK sub-major occupation groups, ranked lists (the highest ranked, top, and lowest ranked, bottom) of O*NET features that are: currently high-valued, complementary and anti-complementary

SOC	TITLE	CURRENT FEATURES	COMPLEMENTARY FEATURES	ANTI-COMPLEMENTARY FEATURES
1100	Corporate Managers and Directors	Administration and Management Oral Expression Oral Comprehension	Science Operations Analysis Originality	Public Safety and Security Law and Government Sound Localization
1200	Other Managers and Proprietors	Customer and Personal Service Oral Expression Oral Comprehension	Science Operations Analysis Originality	Public Safety and Security Engineering and Technology Law and Government
2100	Science, Research, Engineering and Technology Professionals	Computers and Electronics Written Comprehension Oral Comprehension	Science Operations Analysis Fluency of Ideas	Public Safety and Security Sound Localization Law and Government
2200	Health Professionals	Medicine and Dentistry Customer and Personal Service Problem Sensitivity	Operations Analysis Originality Fluency of Ideas	Public Safety and Security Law and Government Customer and Personal Service

SOC	TITLE	CURRENT FEATURES	COMPLEMENTARY FEATURES	ANTI-COMPLEMENTARY FEATURES
2300	Teaching and Educational Professionals	Education and Training Oral Expression English Language	Science Operations Analysis Originality	Public Safety and Security Law and Government Customer and Personal Service
2400	Business, Media and Public Service Professionals	English Language Oral Expression Oral Comprehension	Science Operations Analysis Originality	Public Safety and Security Law and Government Customer and Personal Service
3100	Science, Engineering and Technology Associate Professionals	Oral Comprehension Near Vision Computers and Electronics	Science Operations Analysis Fluency of Ideas	Public Safety and Security Sound Localization Law and Government
3200	Health and Social Care Associate Professionals	Customer and Personal Service Oral Expression Oral Comprehension	Science Operations Analysis Judgment and Decision-Making	Public Safety and Security Law and Government Customer and Personal Service
3300	Protective Service Occupations	Public Safety and Security Law and Government English Language	Gross Body Equilibrium Science Gross Body Coordination	Public Safety and Security Law and Government Engineering and Technology
3400	Culture, Media and Sports Occupations	English Language Oral Expression Oral Comprehension	Fluency of Ideas Originality Judgment and Decision-Making	Public Safety and Security Law and Government Sound Localization
3500	Business and Public Service Associate Professionals	English Language Oral Comprehension Oral Expression	Science Operations Analysis Fluency of Ideas	Public Safety and Security Law and Government Customer and Personal Service
4100	Administrative Occupations	Customer and Personal Service Oral Expression Clerical	Judgment and Decision-Making Science Fluency of Ideas	Public Safety and Security Engineering and Technology Mechanical
4200	Secretarial and Related Occupations	Clerical English Language Oral Comprehension	Judgment and Decision-Making Science Fluency of Ideas	Public Safety and Security Engineering and Technology Operation and Control
5100	Skilled Agricultural and Related Trades	Oral Comprehension Oral Expression Active Listening	Gross Body Equilibrium Operations Analysis Fluency of Ideas	Sound Localization Engineering and Technology Mechanical

SOC	TITLE	CURRENT FEATURES	COMPLEMENTARY FEATURES	ANTI-COMPLEMENTARY FEATURES
5300	Skilled Construction and Building Trades	Building and Construction Manual Dexterity Arm-Hand Steadiness	Gross Body Equilibrium Sales and Marketing Gross Body Coordination	Repairing Mechanical Computers and Electronics
5400	Textiles, Printing and Other Skilled Trades	Problem Sensitivity Production and Processing Oral Comprehension	Sales and Marketing Gross Body Equilibrium Operations Analysis	Engineering and Technology Sound Localization Public Safety and Security
6100	Caring Personal Service Occupations	Oral Expression Oral Comprehension Customer and Personal Service	Judgment and Decision-Making Fluency of Ideas Originality	Public Safety and Security Engineering and Technology Operation and Control
6200	Leisure, Travel and Related Personal Service Occupations	Customer and Personal Service Oral Expression Oral Comprehension	Fluency of Ideas Judgment and Decision-Making Originality	Public Safety and Security Engineering and Technology Reading Comprehension
7100	Sales Occupations	Customer and Personal Service Oral Comprehension Oral Expression	Judgment and Decision-Making Fluency of Ideas Originality	Public Safety and Security Engineering and Technology Reading Comprehension
7200	Customer Service Occupations	Customer and Personal Service Oral Expression Oral Comprehension	Judgment and Decision-Making Fluency of Ideas Originality	Public Safety and Security Law and Government Operation and Control
8100	Process, Plant and Machine Operatives	Near Vision Production and Processing Problem Sensitivity	Gross Body Equilibrium Sales and Marketing Judgment and Decision-Making	Repairing Sound Localization Mechanical
8200	Transport and Mobile Machine Drivers And Operatives	Transportation Far Vision Customer and Personal Service	Gross Body Equilibrium Sales and Marketing Gross Body Coordination	Engineering and Technology Mechanical Computers and Electronics
9100	Elementary Trades and Related Occupations	Manual Dexterity Multilimb Coordination Static Strength	Gross Body Equilibrium Sales and Marketing Economics and Accounting	Repairing Computers and Electronics Reading Comprehension
9200	Elementary Administration and Service Occupations	Customer and Personal Service Oral Comprehension Oral Expression	Gross Body Equilibrium Gross Body Coordination Judgment and Decision-Making	Repairing Reading Comprehension Computers and Electronics