Using Artificial Intelligence in addressing Cybersecurity Skills Shortage

Dr Syed Naqvi

S.S.Naqvi@ljmu.ac.uk

- Artificial Intelligence has emerged as a great enabler to significantly reduce human efforts in computing process

- Besides human efforts, the level of competencies needed to build and/or run a range of systems have been considerably lowered.

- This **human-machine partnership** has created new business models and is also allowing a wider participation of less trained workforce to specialist areas.

  - Resulting in reduced skills gap.

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Is it true with Cybersecurity?

Reason for Using Artificial Intelligence in Cyber Security

This article highlights why artificial intelligence in cybersecurity is used to protect your networks and data.

- To Enhance Automated Cyberthreat Detection
- To Secure Authentication
- To Keep Your Cybersecurity Error-Free
- To Handle Large Volumes of Secure Data
- To Pick Out the Tiniest Threat in Cyber Haystacks
- To Accelerate Detection and Response Time
- To tackle Advanced Hacking Techniques

Which cyber security skills do you find it difficult to recruit for within the UK now?

Legend: ■ Very difficult ■ A bit difficult ■ Not at all difficult □ N/A

- Information Security Management
- Information Risk Management
- Implementing Secure Systems
- Information Assurance Methodologies and Testing
- Operational Security Management
- Incident Management
- Audit, Assurance & Review
- Business Continuity Management
- Information Systems Research
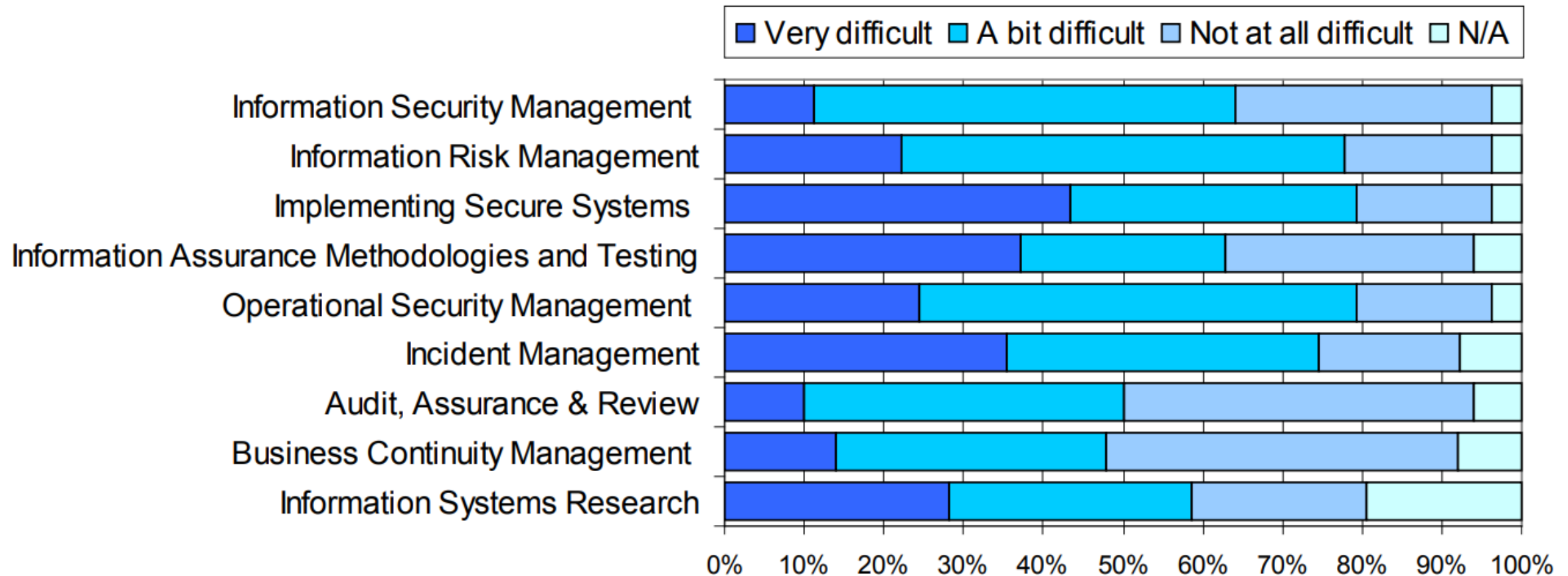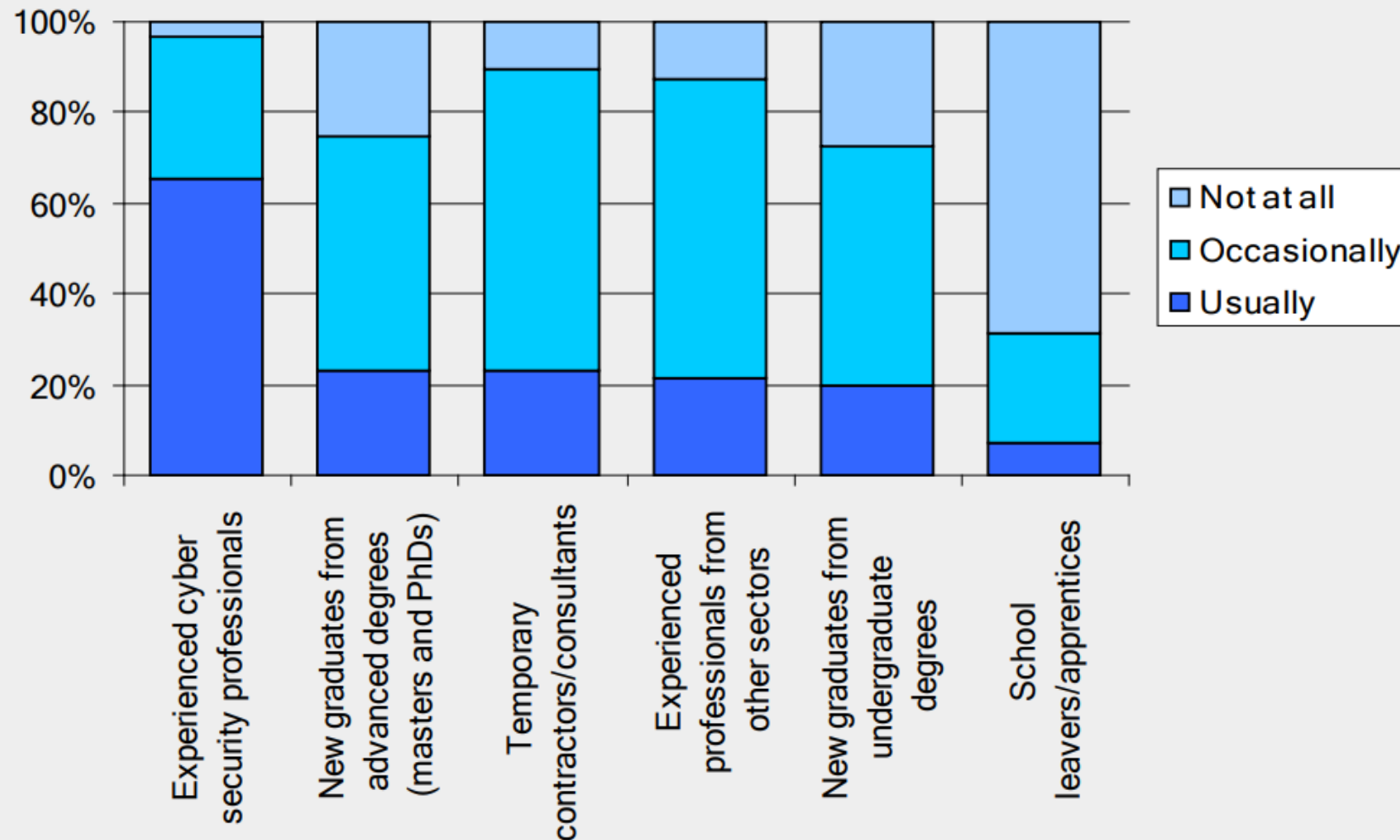
X-axis: 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Figure 4.6: Percentage of cyber firms that have skills gaps in the following technical areas, among those that have identified any skills gaps

Technical area	Percentage
Incident management, investigation or digital forensics	47%
Product development	45%
Assurance, audits, compliance or testing	43%
Operational security management	42%
Implementing secure systems	40%
Threat assessment or information risk management	38%
Cyber security governance and management	38%
Cyber security research	35%
Business resilience	21%

Activate Wir

What types of people do you recruit to fill cyber roles?

LIVERPOOL JOHN MOORES UNIVERSITY

■ Across all cyber sector

■ Across non-large cyber sector businesses (under 250 staff)

Recruited or joined from previous role in cyber security — 54% / 53%

Recruited or joined from non-cyber related previous role — 27% / 29%

Career starter (e.g. graduate or apprentice) — 19% / 18%

Which, if any, professional cyber/ information assurance qualifications/accreditations do you look for when you are recruiting staff (select all that apply)?
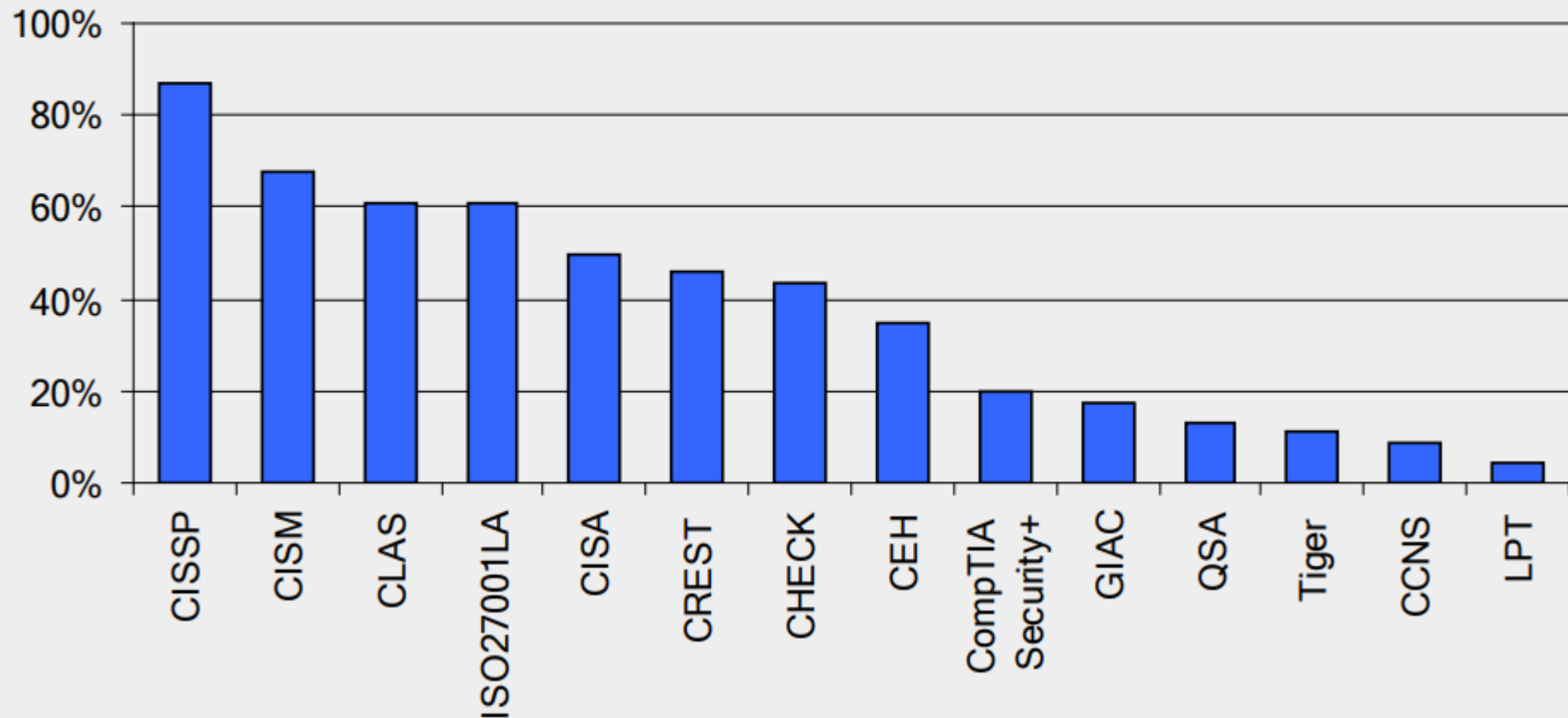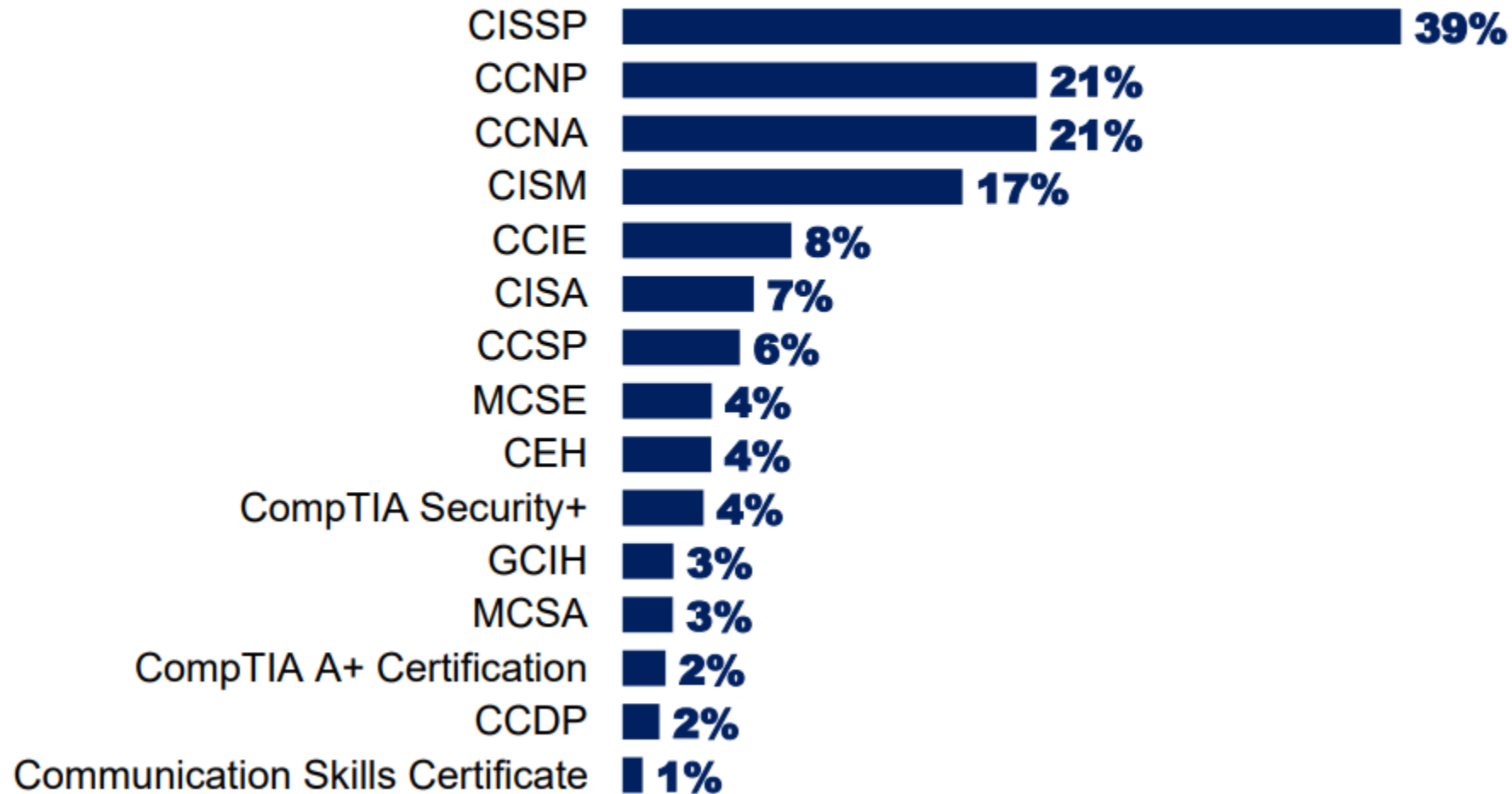
Figure 7.10: Percentage of core cyber job postings asking for the following certifications (where any certification is identified)

Certification	Percentage
CISSP	39%
CCNP	21%
CCNA	21%
CISM	17%
CCIE	8%
CISA	7%
CCSP	6%
MCSE	4%
CEH	4%
CompTIA Security+	4%
GCIH	3%
MCSA	3%
CompTIA A+ Certification	2%
CCDP	2%
Communication Skills Certificate	1%

SECURITY REVIEW

Cybersecurity Skills Gap Contributed to 80 Percent of Breaches: Fortinet Report

Published 7 months ago on May 9, 2022
By **Edward Frank**

Recruitment and retention of talent is a problem

60% struggle to recruit cybersecurity talent. 52% struggle to retain it

67% agree the skills shortage creates additional cyber risk
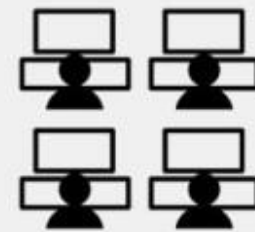
76% have a board recommending increases in IT and cybersecurity headcount

SKILLS GAP STILL NOT SHRINKING

Cybersecurity Skills Gap Co[ ]
Percent of Breaches: Fortin[ ]

Published 7 months ago on May 9, 2022
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ISACA®
Trust in, and value from, information systems

69% say their cybersecurity teams are **understaffed**.

58% have **unfilled (open)** cybersecurity positions.

32% say it **takes six months or more** to fill cybersecurity jobs at their organization.

UP **6** pts.

Figure 6.2: Most common reasons offered by cyber sector businesses for having hard-to-fill vacancies (unprompted – multiple answers allowed)
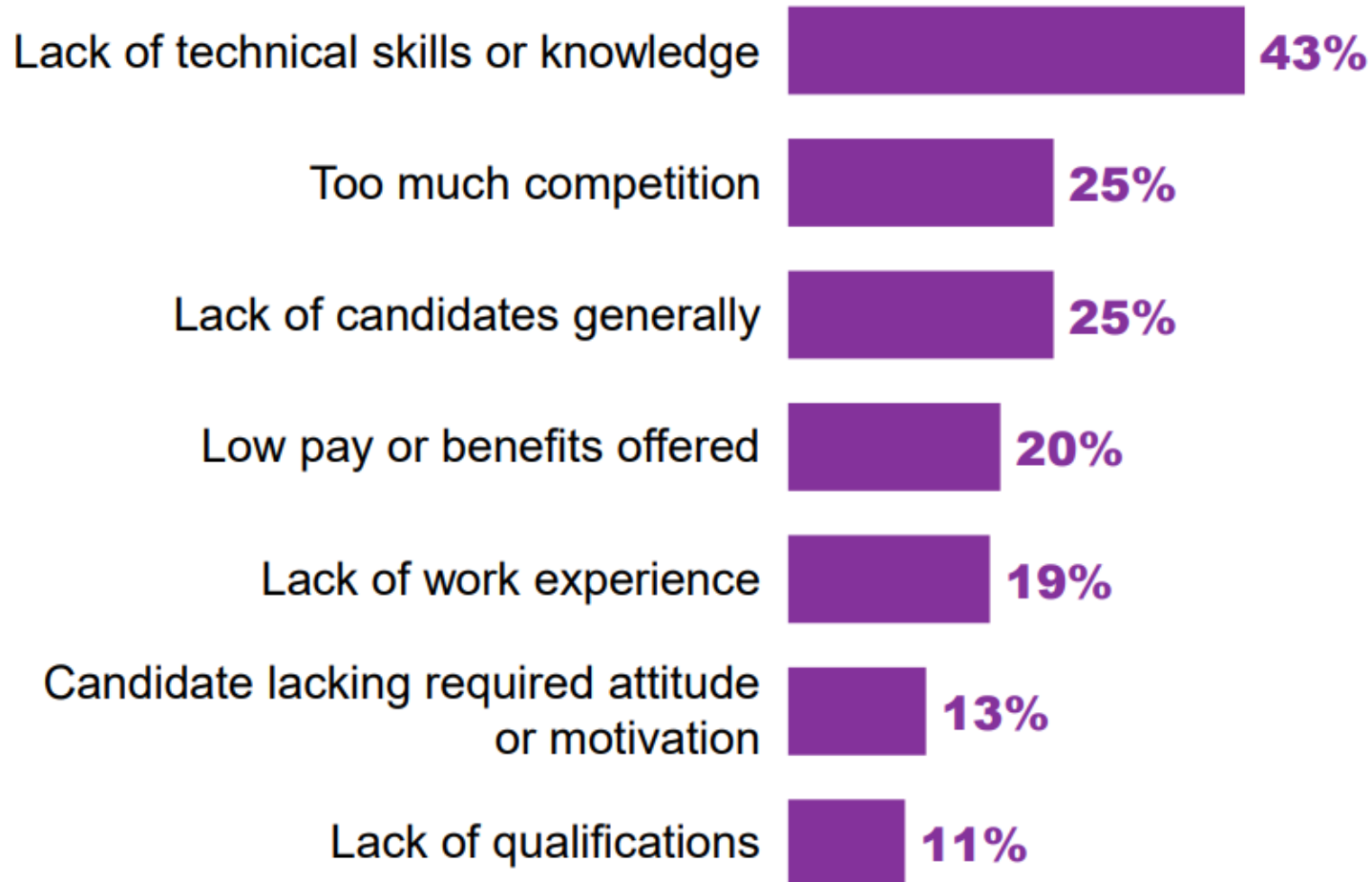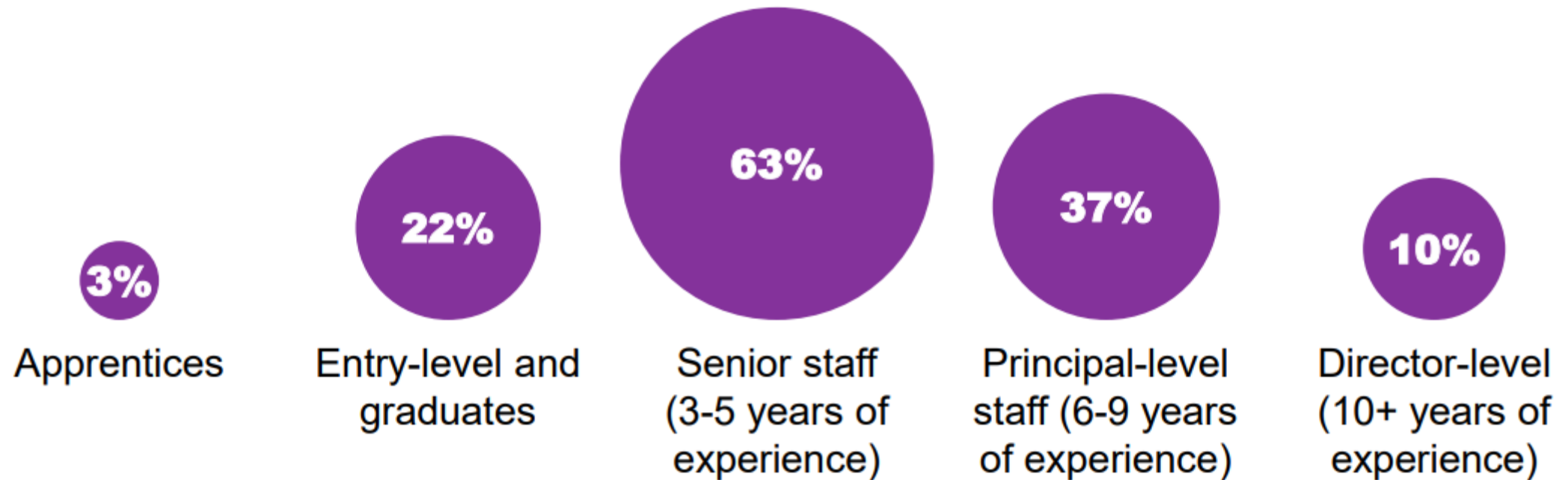
Lack of technical skills or knowledge — 43%

Too much competition — 25%

Lack of candidates generally — 25%

Low pay or benefits offered — 20%

Lack of work experience — 19%

Candidate lacking required attitude or motivation — 13%

Lack of qualifications — 11%

Figure 6.5: Percentage of cyber sector businesses that have found it hard to fill positions at the following levels, among those that have had hard-to-fill vacancies

3% Apprentices

22% Entry-level and graduates

63% Senior staff (3-5 years of experience)

37% Principal-level staff (6-9 years of experience)

10% Director-level (10+ years of experience)

Data Scientists

Data Scientist: The Sexiest Job of the 21st Century

Meet the people who can coax treasure out of messy, unstructured data. by Thomas H. Davenport and DJ Patil

From the Magazine (October 2012)

Data scientists' most basic, universal skill is the ability to write code.

Data Scientist: The S...
Job of the 21...

Meet the pe...

Data scie...
universal ...ility
to write co...

Data scientists today are akin to Wall Street "quants" of the 1980s and 1990s. In those days people with **backgrounds in physics and math** streamed to investment banks and hedge funds, where they could devise entirely new algorithms and data strategies. Then **a variety of universities developed master's programs** in financial engineering, which churned out a second generation of talent that was more accessible to mainstream firms.

11 Data Scientist Skills Employers Want to See in 2022

1. Data Visualization
2. Python
3. SQL/NoSQL
4. Social Media Mining
5. Fundamental Statistics
6. Natural Language Processing/Machine Learning

7. Microsoft Excel
8. High-Level Math
9. Teamwork
10. Communication
11. Business Savvy

ANALYSIS | COMPUTING

The Top Programming Languages 2019 › Python remains the big kahuna, but specialist languages hold their own

BY STEPHEN CASS | 06 SEP 2019 | 3 MIN READ

__Python__'s popularity is driven in no small part by the vast number of specialized libraries available for it, particularly in the domain of __artificial intelligence__

Secretaries

A Modern PA: The Changing Role of the Personal Assistant

POSTED ON MONDAY, JANUARY 28, 2019 BY TOP LONDON PA

A Modern PA: The Changing Role of the Personal Assistant

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- **Strong communication skills**
- **An embrace of new technologies**
- **Adaptability and openness to creative ways of working**
- **Strategic problem solving**
- **Dependability / trustworthiness**
- **Self-motivation and a strong sense of initiative**

There is a POTENTIAL!

Times Higher Education

AI bot poses as essay writer for hire to catch contract cheaters

Essay mill expert likens Georgia Tech's tactics to entrapment

Way Forward
Some Thoughts

AI in Cybersecurity: Today

Average cost of a data breach reaches an all-time high

Data breach average cost increased 2.6% from USD 4.24 million in 2021 to USD 4.35 million in 2022. The average cost has climbed 12.7% from USD 3.86 million in the 2020 report.

Security AI had the biggest cost-mitigating effect

Security artificial intelligence (AI), when fully deployed, provided the biggest cost mitigation. The average breach cost up to USD 3.05 million less at organizations with AI than organizations without AI.

AI in Cybersecurity: Tomorrow

- More innovation is needed in the Cybersecurity Solutions Development to fill the skills gap.

- Conception of Automatic/Aided Cybersecurity Solutions.

- Addition of proactivity and reactivity instead of only speeding-up the processing.

- Expert systems to propose/recommend Cybersecurity solutions with drag and drop APIs for customisations.

- Feeling of empowerment – Higher level of Confidence

- A small number of MSc programmes in the area of Cybersecurity and Artificial Intelligence are offered.

  - This is a good start for **Upskilling**

  - More comprehensive than CPDs

- Undergraduate programmes are needed!

Figure 7.9: Percentage of core and cyber-enabled job postings asking for the following minimum levels of education (where any minimum requirement is identified)

■ Core   ■ Cyber-enabled

Level 5/postgraduate
8%
6%

Bachelor's degree or equivalent
82%
73%

Foundation degrees, HNDs
1%
2%

Level 4/HNC or equivalent
2%
2%

Level 3/A Level or equivalent
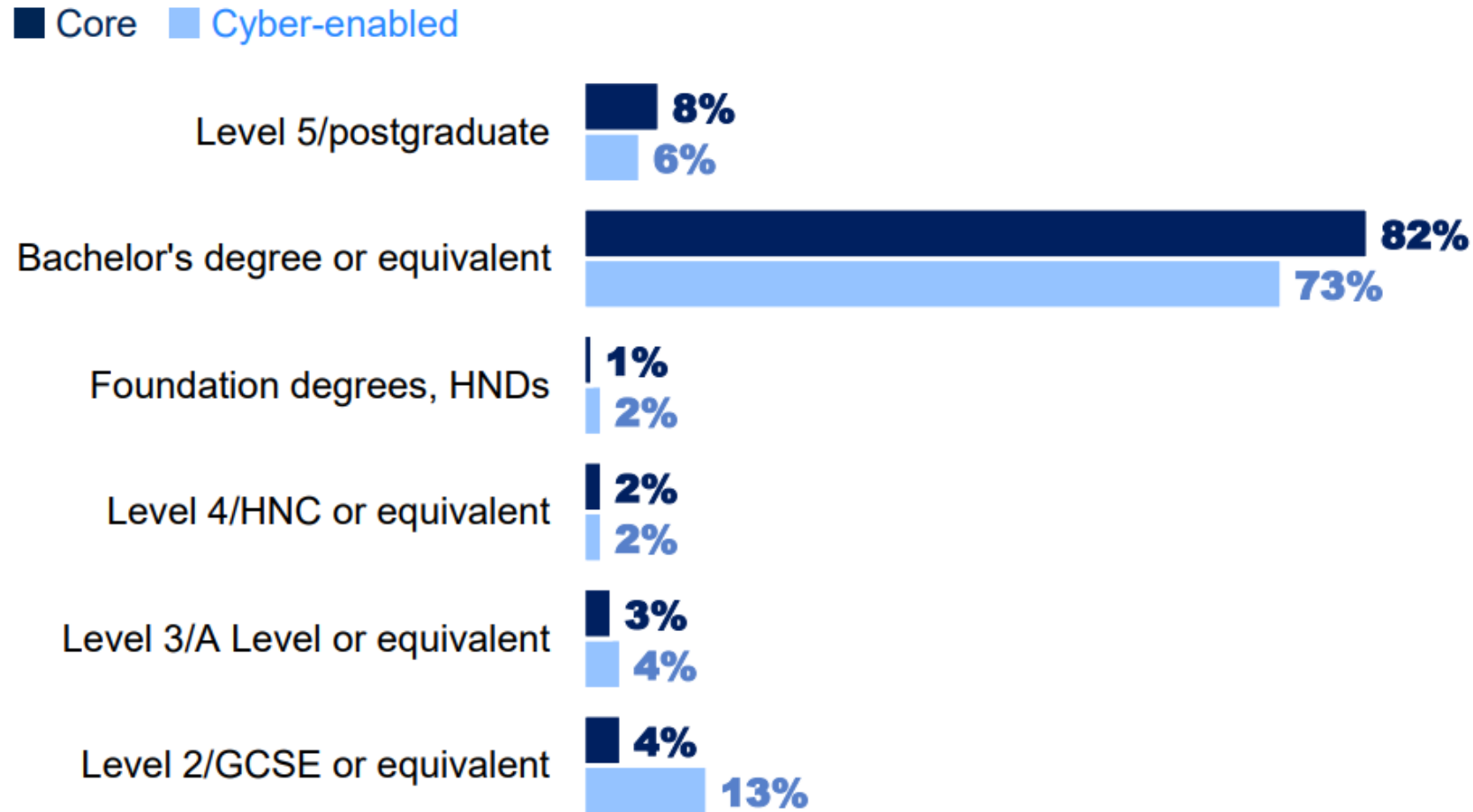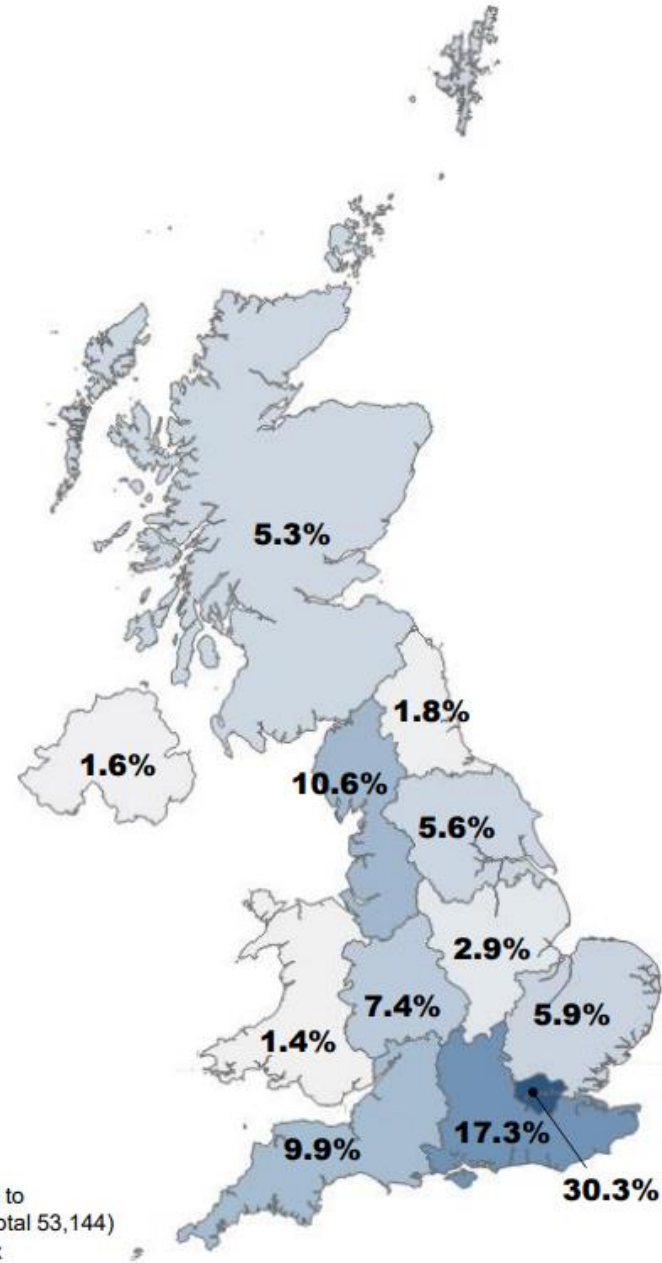3%
4%

Level 2/GCSE or equivalent
4%
13%

Figure 7.3: Percentage of core cyber job postings from each UK region

Ranking

1. Greater London (30.3%)
2. South East (17.3%)
3. North West (10.6%)
4. South West (9.9%)
5. West Midlands (7.4%)
6. East of England (5.9%)
7. Yorkshire and the Humber (5.6%)
8. Scotland (5.3%)
9. East Midlands (2.9%)
10. Northern Ireland (1.6%)
11. Wales (1.4%)
12. North East (1.8%)

Source: Burning Glass Technologies
Base: 41,803 core cyber job postings from January to
December 2021 where region was listed (out of a total 53,144)
Map created using OpenStreetMap data in Mapbox