Arbeidsmarkt cybersecurity

Mark Ruijsendaal

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2022

Auteurs: Nicole van Deursen is redactielid van iB-Magazine. Nicole van Deursen is bereikbaar via nicolevandeursen@pvib.nl. Sandra Kagie is freelance tekstschrijver (Sanscript tekstproducties). Sandra is bereikbaar via info@sanscriptproducties.nl.

INTERVIEW

Tekort aan securityspecialisten

'Stop met zoeken naar het schaap met de vijf poten'

Cybersecurity specialisten zijn en blijven lastig te vinden. Dat bedrijven en organisaties vacatures op dit vlak moeilijk ingevuld krijgen, heeft echter niet alleen te maken met een tekort aan talenten. Zelf kunnen en móeten bedrijven volgens Mark Ruijsendaal van het nationale veiligheids-cluster Security Delta (HSD) meer doen om mensen te interesseren voor het vakgebied en misschien nog wel belangrijker om de juiste mensen te behouden voor het vak van informatiebeveiliging. "Wanneer ik nu naar de sector als geheel kijk, zie ik vooral een onvolwassen onderwijs- en arbeidsmarkt. Een opgave voor ons allemaal om dit te veranderen", roept hij op.

5 invloeden op   poten van talent

Beschikbaarheid

Financiering

Talent

Automatisering

Risk appetite

Digitalisering

1 Wet/regelgeving

Society

Work

Taakorganisatie

Tech: AI, Quantum, ..

Arbeidsmarkt

4

3 Risico's

Loopbaan

IAM, Zero trust, …

Security

Education

Competenties

5

7

Type dreigingen

2 Toekomst

Trainingsaanbod

6

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Table 1: Overview of EU Legislations in the Digital Sector

Applicable law	Published in the Official Journal of the European Union.
In negotiation	Proposal by the European Commission entered the legislative process.
Planed initiative	Mentioned by the European Commission as potential legislative initiative.

Research & Innovation	Industrial Policy	Connectivity	Data & Privacy	IPR	Cybersecurity	Law Enforcement	Trust & Safety	E-commerce & Consumer Protection	Competition	Media	Finance
Digital Europe Programme Regulation, (EU) 2021/694	Recovery and Resilience Facility Regulation, (EU) 2021/241	Frequency Bands Directive, (EEC) 1987/372	ePrivacy Directive, (EC)2002/58, 2017/0003(COD)	Database Directive, (EC) 1996/9	Regulation for a Cybersecurity Act, (EU) 2019/881, 2023/0108(COD)	Law Enforcement Directive, (EU) 2016/680	Product Liability Directive (PLD), (EEC) 1985/374, 2022/0302(COD)	Unfair Contract Terms Directive (UCTD), (EEC) 1993/13	EC Merger regulation, (EC) 2004/139	Satellite and Cable Directive, (EEC) 1993/83	Common VAT system, (EC) 2006/112, 2022/0407(CNS)
Horizon Europe Regulation, (EU) 2021/695, (EU) 2021/764	InvestEU Programme Regulation, (EU) 2021/523	Radio Spectrum Decision, (EC) 2002/676	European Statistics, (EC) 2009/223, 2023/0237(COD)	Community Design Directive, (EC) 2002/6, 2022/0391(COD)	Regulation to establish a European Cybersecurity Competence Centre, (EU) 2021/887	Directive on combating fraud and counterfeiting of non-cash means of payment, (EU) 2019/713	Toys Regulation, (EC) 2009/48, 2023/0290(COD)	Price Indication Directive, (EC) 1998/6	Technology Transfer Block Exemption, (EU) 2014/316	Information Society Directive, (EC) 2001/29	Administrative cooperation in the field of taxation, (EU) 2011/16
Regulation on a pilot regime for distributed ledger technology, (EU) 2022/858	Connecting Europe Facility Regulation, (EU) 2021/1153	Open Internet Access Regulation, (EU) 2015/2120	General Data Protection Regulation (GDPR), (EU) 2016/679	Enforcement Directive (IPR), (EC) 2004/48	NIS 2 Directive, (EU) 2022/2555	Regulation on interoperability between EU information systems in the field of borders and visa, (EU) 2019/817	European Standardization Regulation, (EU) 2012/1025	E-commerce Directive, (EC) 2000/31	Company Law Directive, (EU) 2017/1132, 2023/0089(COD)	Audio-visual Media Services Directive (AVMSD), (EU) 2010/13	Payment Service Directive 2 (PSD2), (EU) 2015/2366, 2023/0209(COD)
	Regulation on High Performance Computing Joint Undertaking, (EU) 2021/1173, 2024/0016(CNS)	European Electronic Communications Code Directive (EECC), (EU) 2018/1972	Regulation to protect personal data processed by EU institutions, bodies, offices and agencies, (EU) 2018/1725	Directive on the protection of trade secrets, (EU) 2016/943	Cybersecurity Regulation, (EU) 2023/2841	Regulation on terrorist content online, (EU) 2021/784	Radio Equipment Directive (RED), (EU) 2014/53	Unfair Commercial Practices Directive (UCPD), (EC) 2005/29	Market Surveillance Regulation, (EU) 2019/1020	Portability Regulation, (EU) 2017/1128	Digital Operational Resilience Act (DORA Regulation), (EU) 2022/2554
	Regulation on Joint Undertakings under Horizon Europe, (EU) 2021/2085, 2022/0033(NLE)	.eu top-level domain Regulation, (EU) 2019/517	Regulation on the free flow of non-personal data, (EU) 2018/1807	Design Directive, 2022/0392(COD)	Information Security Regulation, 2022/0084(COD)	Temporary CSAM Regulation, (EU) 2021/1232, 2022/0155(COD)	eIDAS Regulation (European Digital Identity Framework), (EU) 2014/910	Directive on Consumer Rights (CRD), (EU) 2011/83	P2B Regulation, (EU) 2019/1150	Satellite and Cable II Directive, (EU) 2019/789	Crypto-assets Regulation (MiCA), (EU) 2023/1114
	Decision on a path to the Digital Decade, (EU) 2022/2481	Roaming Regulation, (EU) 2022/612	Open Data Directive (PSI), (EU) 2019/1024	Compulsory licensing of patents, 2023/0129(COD)	Cyber Resilience Act, 2022/0272(COD)	E-evidence Regulation, (EU) 2023/1543	Regulation for a Single Digital Gateway, (EU) 2018/1724	e-invoicing Directive, (EU) 2014/55	Single Market Programme, (EU) 2021/690	Copyright Directive, (EU) 2019/790	Financial Data Access Regulation, 2023/0205 (COD)
	European Chips Act (Regulation), (EU) 2023/1781	Union Secure Connectivity Programme, (EU) 2023/588	Data Governance Act (DGA Regulation), (EU) 2022/868	Standard essential patents, 2023/0133(COD)	Cyber Solidarity Act (Regulation), 2023/0109(COD)	Digitalisation of cross-border judicial cooperation, (EU) 2023/2844	General Product Safety Regulation, (EU) 2023/988	Regulation on cooperation for the enforcement of consumer protection laws, (EU) 2017/2394	Vertical Block Exemption Regulation (VBER), (EU) 2022/720	European Media Freedom Act, (EU) 2024/1083	Payment Services Regulation, 2023/0210(COD)
	Establishing the Strategic Technologies for Europe Platform (STEP), (EU) 2024/795	Gigabit Infrastructure Act, (EU) 2024/1309	European Data Act (Regulation), (EU) 2023/2854			Directive on combating violence against women, 2022/0066(COD)	Machinery Regulation, (EU) 2023/1230	Geo-Blocking Regulation, (EU) 2018/302	Digital Market Act (DMA Regulation), (EU) 2022/1925	Remuneration of musicians from third countries for recoredd music played in the EU	Digital euro, 2023/0212 (COD)
	European critical raw materials act (Regulation), (EU) 2024/1252	New radio spectrum policy programme (RSPP 2.0)	Interoperable Europe Act, (EU) 2024/903			Directive for combating sexual abuse and child sexual abuse material, 2024/0035(COD)	AI Act (Regulation), 2021/0106(COD)	Digital content Directive, (EU) 2019/770	Regulation on distortive foreign subsidies, (EU) 2022/2560		Regulation on combating late payment, 2023/0323(COD)
	Net Zero Industry Act, 2023/0081(COD)	Digital Networks Act	Regulation on data collection for short-term rental, (EU) 2024/1028				Eco-design Regulation, 2022/0095(COD)	Directive on certain aspects concerning contracts for the sale of goods, (EU) 2019/771	Horizontal Block Exemption Regulations (HBER), (EU) 2023/1066, (EU) 2023/1067		
	EU Space Law		European Health Data Space (Regulation), 2022/0140(COD)			Digitalization of travel documents	AI Liability Directive, 2022/0303(COD)	Digital Services Act (DSA Regulation), (EU) 2022/2065	Platform Work Directive, 2021/0414(COD)		
			Harmonisation of GDPR enforcement procedures, 2023/0202(COD)					Political Advertising Regulation, (EU) 2024/900	Single Market Emergency Instrument (SMEI), 2022/0278(COD)		
			Access to vehicle data, functions and resources					Right to repair Directive, 2023/0083(COD)			
			GreenData4all					Consumer protection: strengthened enforcement cooperation			

https://www.bruegel.org/dataset/dataset-eu-legislation-digital-world

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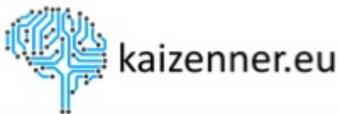
Fig. 1 - Most identified initial infection vector.
Source: ENISA dataset

- 0.8% Insider threat
- 8% Malicious applications
- 9.9% Botnet
- 60% Phishing
- 21.3% Vulnerabilities
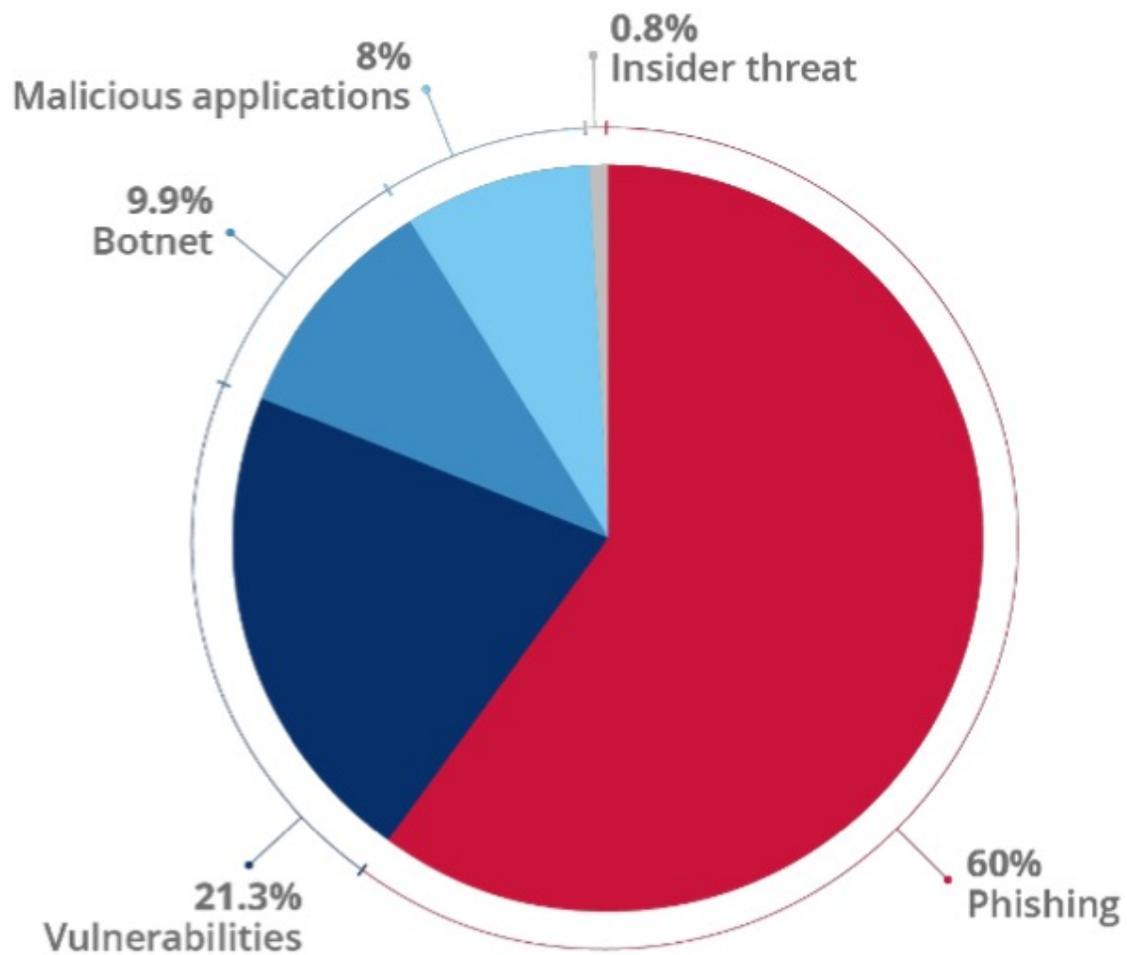
Fig. 5 - Distribution of threats.
Source: ENISA dataset

- 10.6% Supply Chain
- 18.2% Operational Technology
- 1.5% Exposure
- 42.4% Mobile Threats
- 27.3% Web Threats

ENISA Threat Landscape 2025

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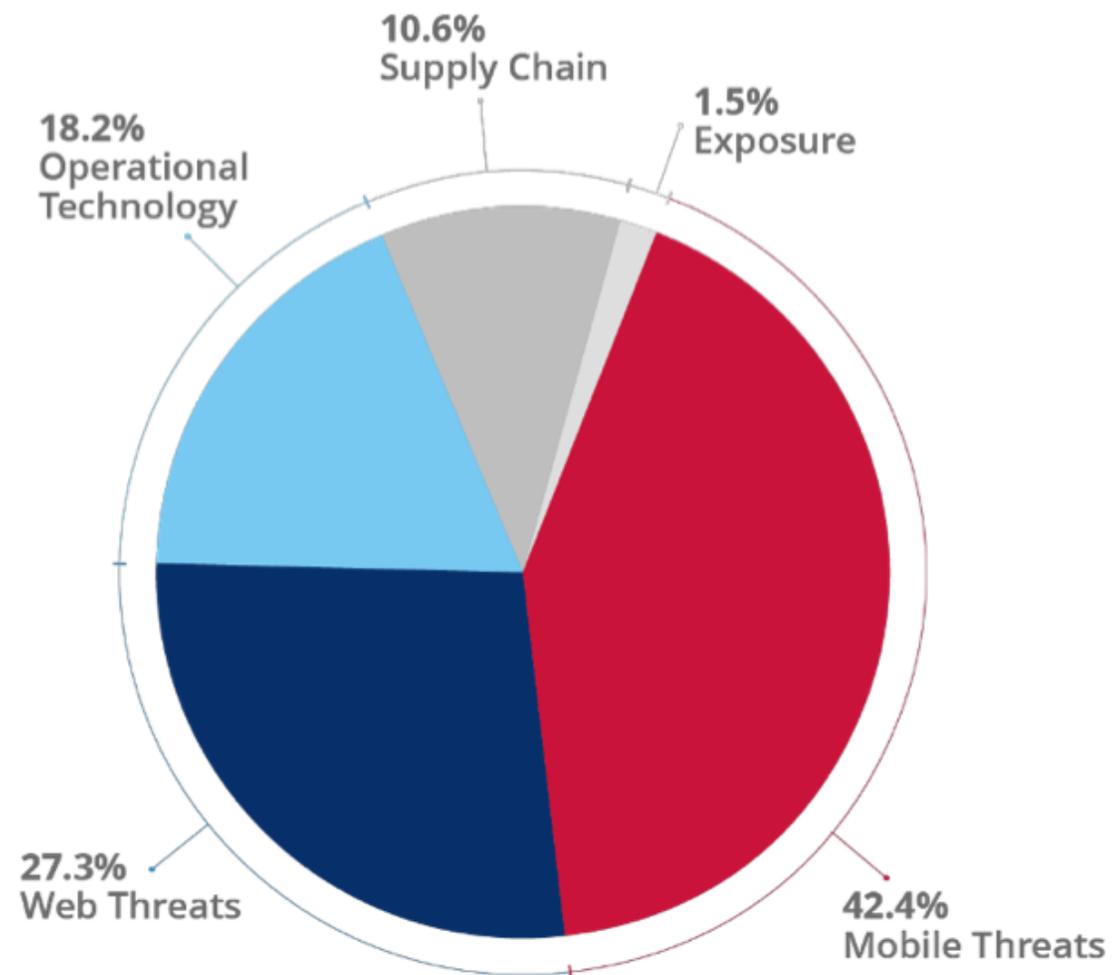
Rank	ID	Name	Score	CVEs in KEV	Rank Change vs. 2023
1	CWE-79	Improper Neutralization of Input During Web Page Generation ('Cross-site Scripting')	56,92	3	+1
2	CWE-787	Out-of-bounds Write	45,2	18	-1
3	CWE-89	Improper Neutralization of Special Elements used in an SQL Command ('SQL Injection')	35,88	4	0
4	CWE-352	Cross-Site Request Forgery (CSRF)	19,57	0	+5
5	CWE-22	Improper Limitation of a Pathname to a Restricted Directory ('Path Traversal')	12,74	4	+3
6	CWE-125	Out-of-bounds Read	11,42	3	+1
7	CWE-78	Improper Neutralization of Special Elements used in an OS Command ('OS Command Injection')	11,3	5	-2
8	CWE-416	Use After Free	10,19	5	-4
9	CWE-862	Missing Authorization	10,11	0	+2
10	CWE-434	Unrestricted Upload of File with Dangerous Type	10,03	0	0
11	CWE-94	Improper Control of Generation of Code ('Code Injection')	7,13	7	+12
12	CWE-20	Improper Input Validation	6,78	1	-6
13	CWE-77	Improper Neutralization of Special Elements used in a Command ('Command Injection')	6,74	4	+3
14	CWE-287	Improper Authentication	5,94	4	-1
15	CWE-269	Improper Privilege Management	5,22	0	+7
16	CWE-502	Deserialization of Untrusted Data	5,07	5	-1
17	CWE-200	Exposure of Sensitive Information to an Unauthorized Actor	5,07	0	+13
18	CWE-863	Incorrect Authorization	4,05	2	+6

ENISA Threat Landscape 2025- Common Weakness Enumeration (CWE)

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Table 1. New prioritisation of threats

	THREAT	RISK (I*L)	IMPACT	LIKELIHOOD
1.	Supply Chain Compromise of Software Dependencies	17,71	4,21	4,21
2.	Skill Shortage	17,20	4,10	4,20
3.	Human Error and Exploited Legacy Systems within Cyber-Physical Ecosystems	16,69	3,96	4,22
4.	Exploitation of Unpatched and Out-of-date Systems within the Overwhelmed Cross-sector Tech Ecosystem [Optional]	16,21	4,05	4,00
5.	Rise of Digital Surveillance Authoritarianism / Loss of Privacy	15,34	3,96	3,88
6.	Cross-border ICT Service Providers as Single Point of Failure	15,12	4,14	3,65
7.	Advanced Disinformation / Influence Operations (IO) Campaigns	14,38	3,42	4,21
8.	Rise of Advanced Hybrid Threats	14,03	3,68	3,81
9.	Abuse of AI	13,22	3,43	3,86
10.	Physical Impact of Natural/Environmental Disruptions on Critical Digital Infrastructure [Optional]	12,99	3,68	3,53

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Dashboard Job Openings HSD-partners

The content of Securitytalent.nl is based on the partners of Security Delta (HSD). Security Talent does not aim at providing a comprehensive collection of all jobs, internships, careers and education in the Netherlands.

Workweek

- 42.3% 40 hours
- 31.8% 36-39 hours
- 22% 32-35 hours
- < 32 hours
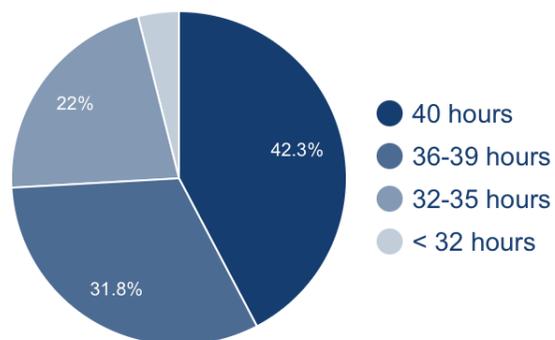
Community Size

- National Security
- Cyber Security
- Critical Infrastructure
- Urban Security
- Forensics

Distribution of Jobs

least █████████████ most

Top Job Profiles

1. ICT security specialist 2 (applied-level)
2. Cyber Security Consultant
3. Security Manager
4. Application Developer
5. Data Analyst
6. ICT Security Manager

Jobs by Education Level

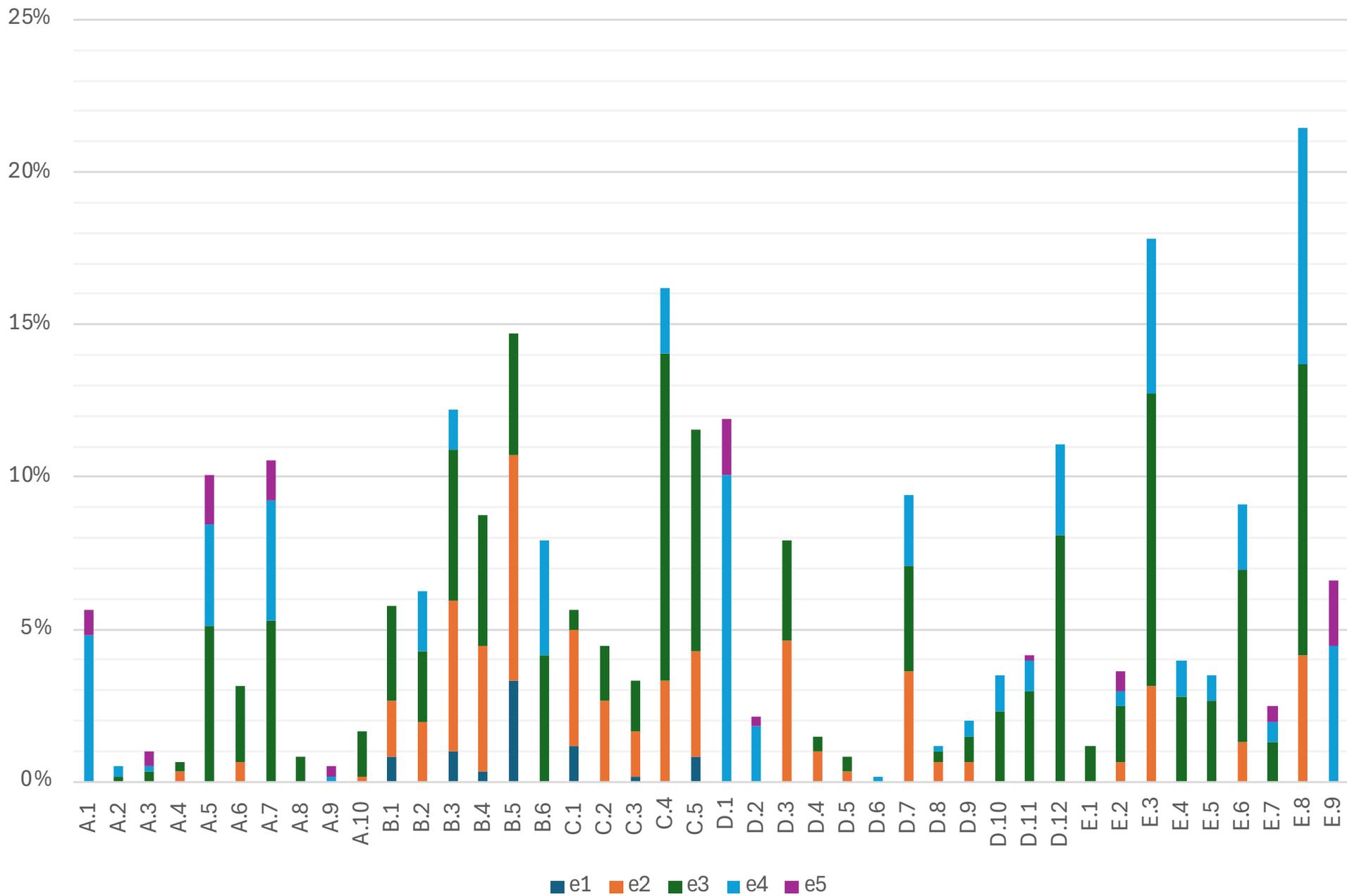- Doctorate/PhD (EQF 8)
- Master (EQF 7)
- Bachelor (EQF 6)
- Associate degree (EQF 5)
- MBO-4/HAVO/VWO (EQF 4)
- MBO-3 (EQF 3)
- MBO-2/VMBO-kade.. (EQF 2)
- MBO-1/VMBO-BB (EQF 1)

0%   20%

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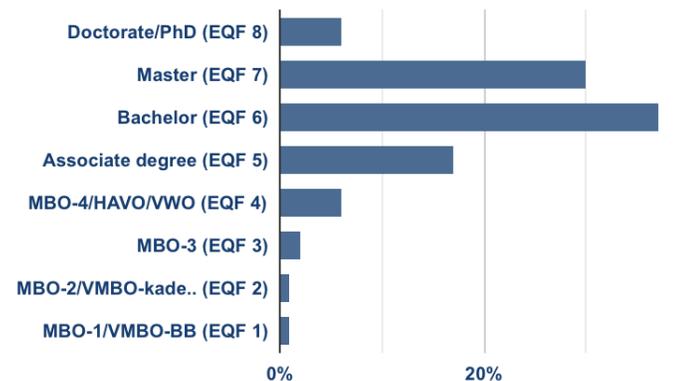
Veel gevraagde taken, skills en kennis

#	Main task(s)	Categorie	% vacatures	Aantal vacatures
1	Develop relationships with cybersecurity-related authorities and communities	Man. & Org.	40,7%	24860
2	Cooperate and share information with authorities and professional groups	Man. & Org.	36,7%	22439
3	Collaborate with other teams and colleagues	Man. & Org.	31,4%	19178
4	Cooperate with k... applicable legal f...			
5	Identify cross-sec... context or propo...			
6	Enforce and advo...			
7	Assess cybersecu... including security... organisation's str...			
8	Develop and prop... culture of data pr...			
9	Deploy penetrati...			
10	Design and propo...			

#	Key skill(s)	Categorie	% vacature	Aantal vacature
1	Motivate and encourage people	Man. & Org.	44,0%	26863
2	Identify, analyse and correlate cybersecurity events	Onderzoek	41,9%	25562
3	Collaborate with other tean...			
4	Work on operating systems...			
5	Communicate, coordinate a...			
6	Develop codes, scripts and ...			
7	Develop code, scripts and p...			
8	Think creatively and outside...			
9	Identify and select appropri...			
10	Work under pressure			

#	Key knowledge	Categorie	% vacatures	Aantal vacatures
1	Cybersecurity standards, methodologies and frameworks	Technisch	45,8%	27983
2	Cybersecurity controls and solutions	Technisch	43,1%	26336
3	Cyber threats	Technisch	35,9%	21906
4	Cybersecurity related laws, regulations and legislations	Legal	34,7%	21199
5	Management practices	Man. & Org.	30,3%	18481
6	Cybersecurity procedures	Man. & Org.	30,0%	18296
7	Cybersecurity risks	Technisch	28,2%	17243
8	Cybersecurity recommendations and best practices	Man. & Org.	26,5%	16151
9	Cybersecurity policies	Man. & Org.	21,6%	13167
10	Cybersecurity-related technologies	Technisch	13,9%	8458

Onderzoek cybersecurity arbeids- en opleidingsmarkt, EZK/Dialogic/PTvT, 2023

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Percentual representation: Total Vacancies (all countries)

Security Certification Roadmap

#	Certificaat	% vacatures	Aantal vacatures
1	CISSP	11,2%	6821
2	CISM	8,1%	4925
3	CISA	5,6%	3417
4	CIPP	2,8%	1713
5	CEH	2,1%	1301
6	CCSP	1,6%	999
7	OSCP	1,6%	950
8	CRISC	1,3%	785
9	CIPM	1,2%	762
10	GIAC	0,6%	342
11	GCIH	0,4%	253
12	CSSLP	0,4%	230
13	OSCE	0,3%	204
14	SSCP	0,2%	150
15	GSEC	0,2%	141
16	GCIA	0,2%	105
17	GCFA	0,2%	103
18	CFE	0,2%	97
19	ECSA	0,1%	52
20	GWAPT	0,1%	45
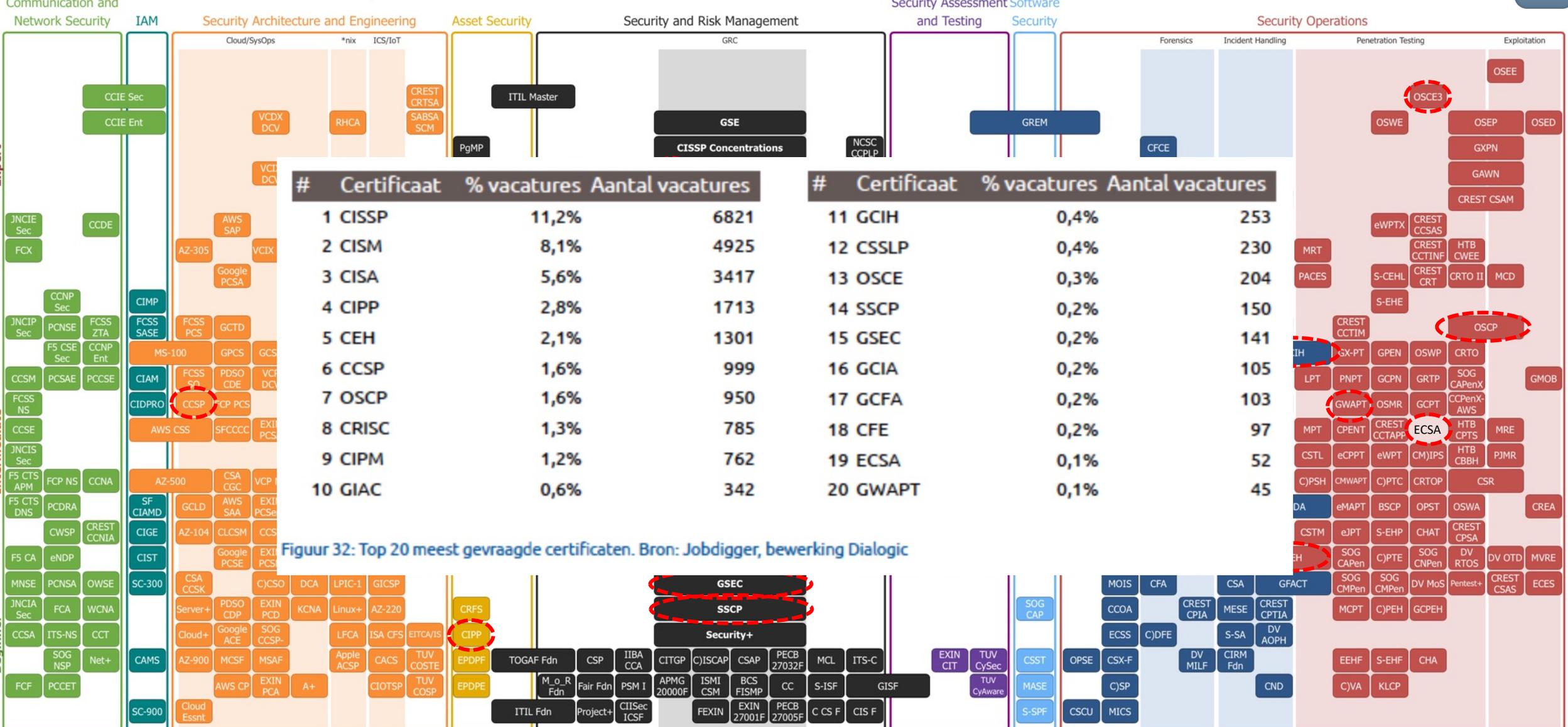
Figuur 32: Top 20 meest gevraagde certificaten. Bron: Jobdigger, bewerking Dialogic

481 certifications listed | July 2024

https://pauljerimy.com/security-certification-roadmap/
Onderzoek cybersecurity arbeids- en opleidingsmarkt, EZK/Dialogic/PTvT, 2024

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Education total line comparison: Per country, per competence total

Legend: Total, Croatia, Cyprus, Netherlands, Greece

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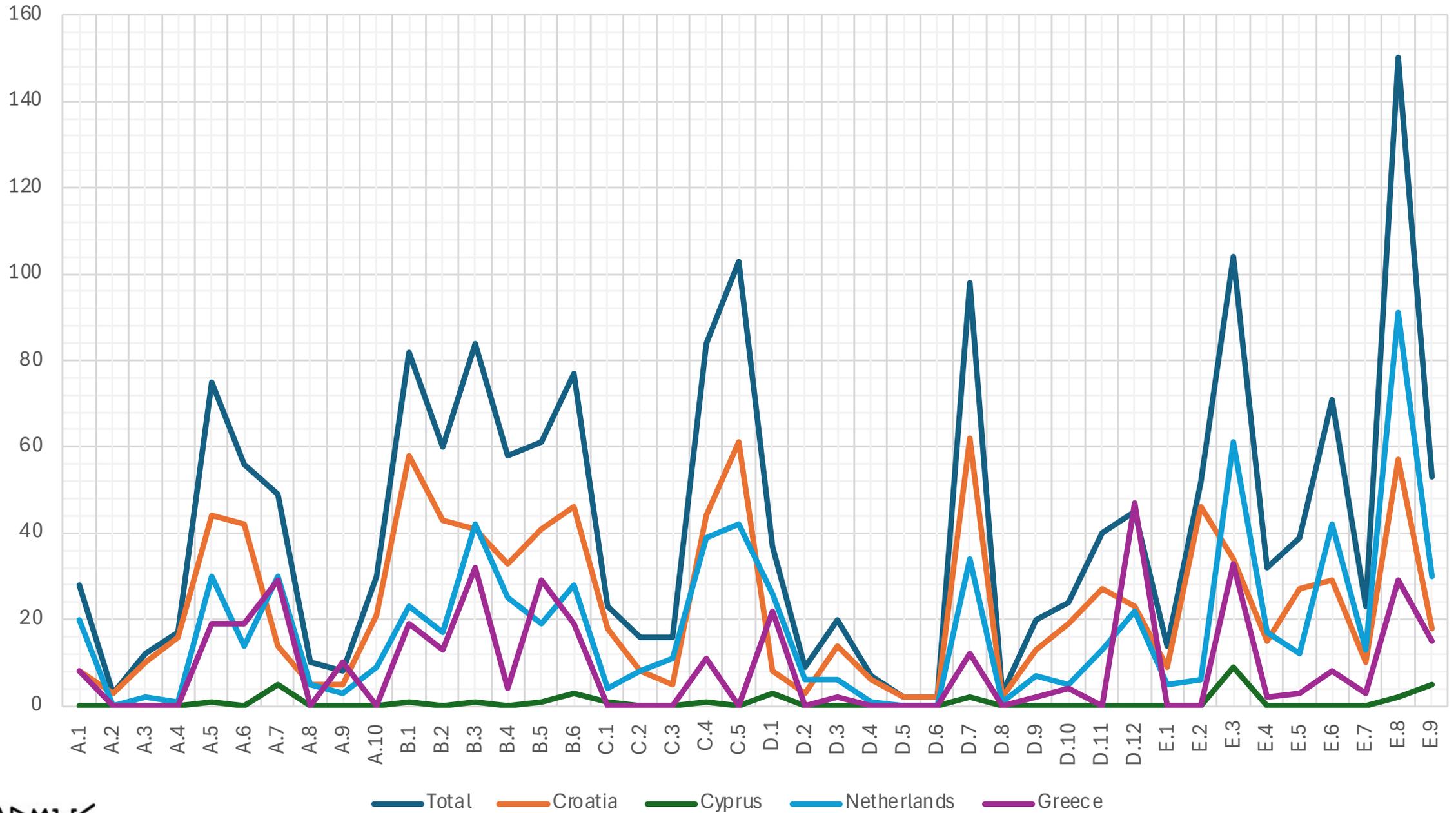
Identified number of trends requiring competence	Cyber hubs - country reports							Literature review	Trend analysis	Focus groups	Adjustment factor
	Lithuania	Spain	Estonia	Slovenia	Greece	Hungary	Belgium				
A.1. IS and Business Strategy Alignment										1	2%
A.2. Service Level Management											0%
A.3. Business Plan Development											0%
A.4. Product/Service Planning											0%
A.5. Architecture Design								1	2		8%
A.6. Application/Product Design										1	2%
A.7. Technology Trend Monitoring										1	2%
A.8. Sustainability Management											0%
A.9. Innovating											0%
A.10. User Experience											0%
B.1. Application/Product Development									2	1	7%
B.2. Component Integration		1	1								2%
B.3. Testing								6	1		21%
B.4. Solution Deployment											0%
B.5. Documentation Production		1	1								2%
B.6. ICT Systems Engineering	1	3	2	1	2	1	1		1		14%
C.1. User Support											0%
C.2. Change Support											0%
C.3. Service Delivery											0%
C.4. Problem Management	1	3	2	1	2			4	2	1	28%
C.5. Systems Management	2	2	2	1	2	1	2	4	1	1	29%
D.1. Information Security Strategy Development								2			6%
D.2. Quality Strategy Development											0%
D.3. Education and Training Provision								6	2		23%
D.4. Purchasing											0%
D.5. Sales Development											0%
D.6. Digital Marketing											0%
D.7. Science and Analysis			1						4	1	13%
D.8. Contract Management											0%
D.9. Personnel Development								5		1	17%
D.10. Information and Knowledge Management								1			3%
D.11. Needs Identification											0%
D.12. Security Consulting									1	1	5%
E.1. Forecast Development											0%
E.2. Project and Portfolio Management											0%
E.3. Risk Management		2	2		1			4	2	1	24%
E.4. Relationship Management									2	1	7%
E.5. Process Improvement											0%
E.6. Quality Management and Compliance	1	1	1		1	1			4	1	17%
E.7. Business Change Management								1	1		6%
E.8. Information Security Management		1	1		1	1	1	4			17%
E.9. Information Systems Governance	1		1				1			1	5%

GAP in courses

Education & Training Provision

Personnel Development

Problem Management

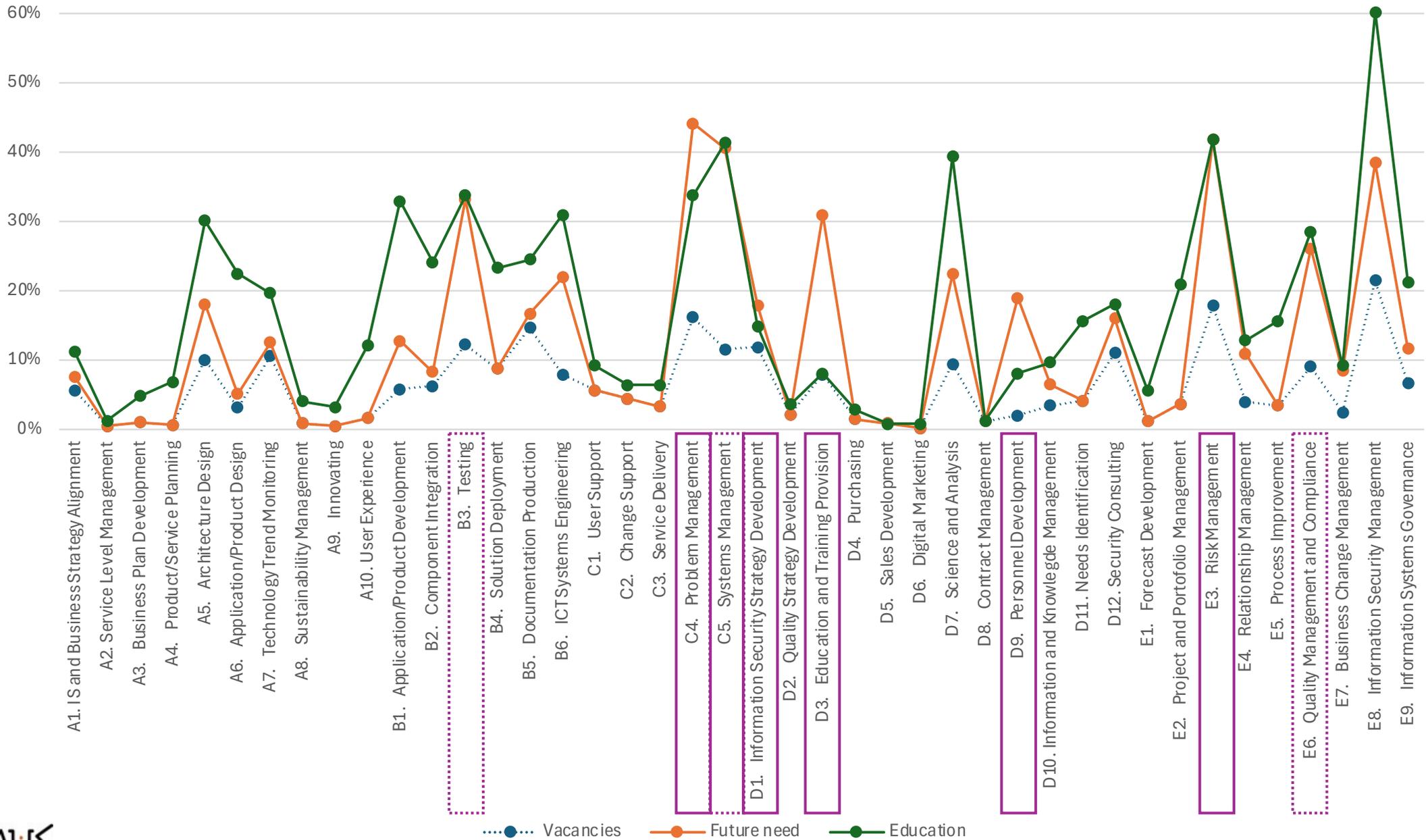## Information Security Strategy Development

Risk Management

<-*->

Systems Management

Testing

Quality Management & Compliance

Competence		Rank Overall
A.1. IS and Bu		24
A.2. Service		9
A.3. Business		25
A.4. Product/		27
A.5. Architec		34
A.6. Applicat		40
A.7. Technolo		28
A.8. Sustaina		22
A.9. Innovati		19
A.10. User Ex		32
B.1. Applicat		41
B.2. Compon		37
B.3. Testing		10
B.4. Solution		36
B.5. Docume		29
B.6. ICT Syste		30
C.1. User Sup		23
C.2. Change		16
C.3. Service		20
C.4. Problem		3
C.5. Systems		12
D.1. Informat Developmen		4
D.2. Quality S		14
D.3. Educatio		1
D.4. Purchas		13
D.5. Sales De		6
D.6. Digital M		8
D.7. Science		38
D.8. Contrac		7
D.9. Personn		2
D.10. Informa Management		21
D.11. Needs		33
D.12. Securit		18
E.1. Forecast		26
E.2. Project a		39
E.3. Risk Mar		5
E.4. Relations		15
E.5. Process		35
E.6. Quality N Compliance		17
E.7. Business		11
E.8. Informat		42
E.9. Informat		31

GAP analysis for cybersecurity education

cadmus-project.eu

Interventies en acties

Training en opleidingsontwikkeling
- Module gebaseerde aanpak voor professionals

Monitoring van arbeidvraag en opleidingen
- Dynamisch veld, inzichten delen

Outreach: vergroot de talentpool
- Bredere selectie, zij-instromers & helpers

Competenties voor matching
- E-CF, CompetentNL, skills framework EC, ECSF

Onderhoudt de workforce
- Ontwikkel individuen, vergroot de pool, behoudt talent

Wrap-up

- Veranderend veld
- Onvolwassen arbeidsmarkt
- Relatief stabiele vaardigheden
- Steeds beter zicht op actuele vraag
- Gebrek aan talent is veiligheidsdreiging
- Hoe te ontwikkelen (Rick)
- Wie te kiezen & ontwikkelen (Ferry)

Mark Ruijsendaal
mark.ruijsendaal@securitydelta.nl

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