Cyber
Women
Community

WOMEN
IN IT AND CYBERSECURITY

SURVEY REPORT

**General Partner of
Cyber Women Community**

standard
chartered

WOMEN IN IT AND CYBERSECURITY

Ladies and Gentlemen,

Diversity is critical within IT and in partnership with the Cyber Women Community, we compiled this report to focus on the importance of female experts in the cybersecurity industry.

A first for Standard Chartered, our survey gathers insights from 218 women working in cybersecurity and IT. It also highlights future trends and includes the important contributions of female IT students – the next generation of our future talent.

Interestingly, the report found that the vast majority of women choosing a career connected with cybersecurity was deliberate – with 80% of female experts making the decision to join the industry. Additionally, 92% of the women we surveyed believe that they can succeed in cyber.

The report also confirms what we have known for a long time: women working in this field are very satisfied with their decision. They are also active ambassadors of the industry, encouraging others to pursue a career in cybersecurity.

At Standard Chartered, diversity and inclusion are deeply held values and we are proud of our growing cybersecurity department in Poland which consists of over 200 top experts with many being women. Being a leading international bank, our cybersecurity team also includes many women who are leaders and mentors for people taking their first steps in the industry; and our female experts are very active members of the Cyber Women Community.

We are proud to champion women in cyber and sponsoring this report. Please keep reading for more detailed survey results on the following pages.

Wishing you an enlightening read!

Cezary Piekarski,

Global Head, Cybersecurity
Services, Trust & Resilience
Standard Chartered Bank

Agata Kulas,

Head of Process and Controls,
Data Management & Privacy,
Chief Data Office Transformation,
Technology and Operations
Poland Location Head
Standard Chartered Bank

SURVEY REPORT
WOMEN IN IT AND CYBERSECURITY

adies and Gentlemen

I am delighted to bring you the report presenting the aspirations, development opportunities and working conditions of women in the cybersecurity industry. The report is based on the findings of a pioneering survey conducted in Poland, which analysed for the first time the role of women in the cybersecurity industry.

The numbers don't lie - in our database, where we have a really good representation of the Polish cybersecurity industry (the database was created over the years of Evention's organisation of many conferences on this subject and the animation of the CSO Council and the Cyber Woman Community), there is only a dozen or so per cent of women. We look to the future with optimism - women's interest in working in cybersecurity is growing and, most importantly, the ladies who are already active in the industry are really very satisfied with their work (surveys have shown a clearly high level of satisfaction). People say that the hardest thing to do is to take the first step to overcome the entry barrier, partly due to the mental barrier and partly due to the need to gain the trust of colleagues and superiors - in order to then be able to build a rewarding career with high growth potential and good employment conditions.

The report presents some of the extensive research we conducted in December 2021 and January 2022. The research was carried out on the initiative of Standard Chartered as a joint project together with the Cyber Women Community. It included both quantitative and qualitative research, targeting three distinct groups: women active in the cybersecurity industry, those working in IT but not in the cybersecurity domain, and female IT students.

Enjoy your reading! I hope the report will be widely discussed and will encourage women to pursue careers in cybersecurity. Looking at the positive impact ladies have on the industry, I am confident that this is the change we need.

Przemysław Gamdzyk
CEO, Evention,
the organiser of Cyber Women Community

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Women find IT a perfect place for themselves

Although the IT industry is still a male-dominated world, more and more women are joining it every year. They do very well in IT and especially in the cybersecurity area. However, despite their high level of competencies, they still struggle with the lack of equal pay or opportunities for faster promotion.
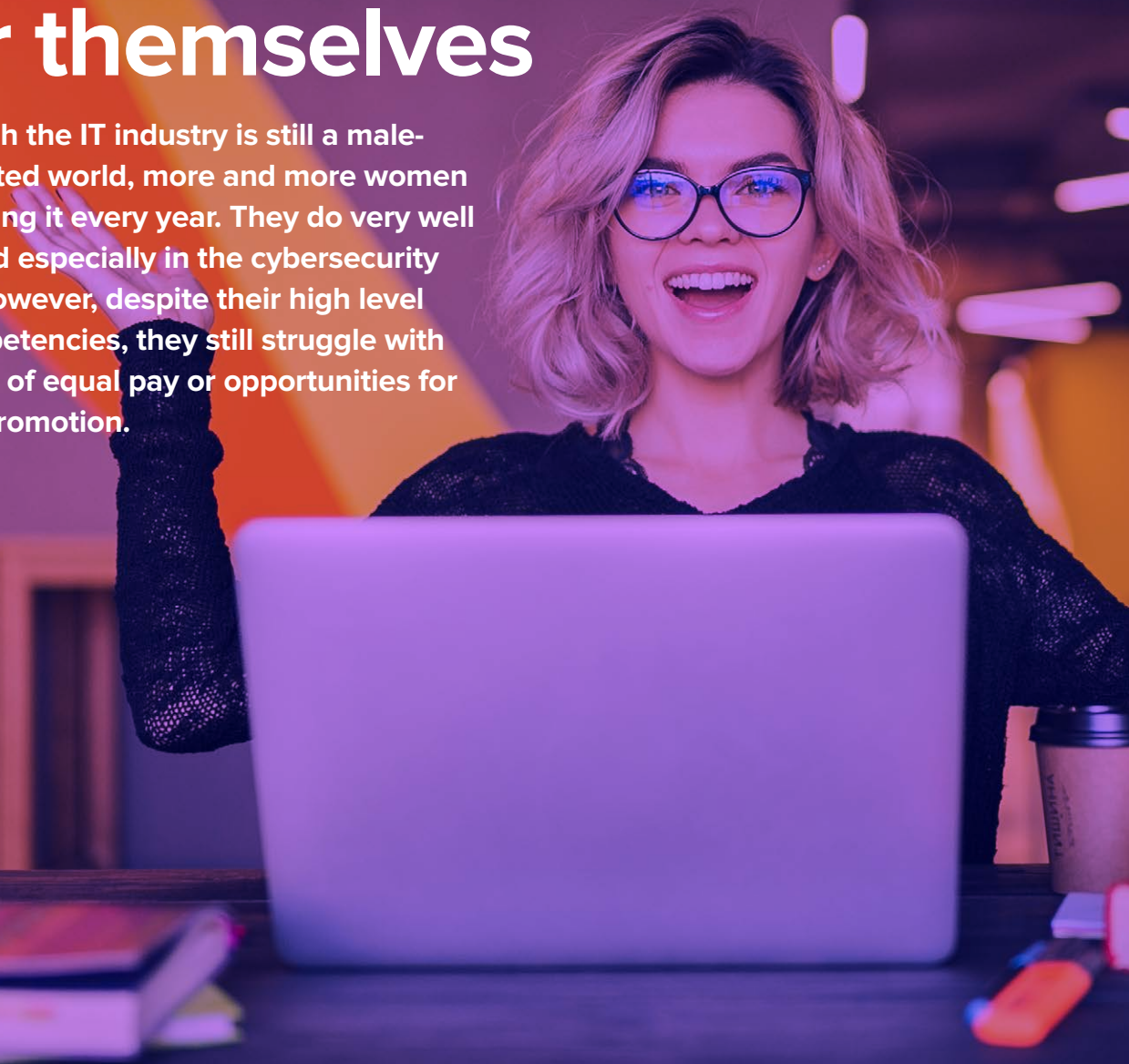
The survey, „Women in IT and the cybersecurity industry", reveals the current situation of women in IT: how and why they got there, what problems they are facing and how they see their future.

The majority of women working in IT are satisfied with their choice and have a high level of job satisfaction. Their competencies are high and there is no area they cannot cope with, although they have the hardest time succeeding in programming - this is still the domain of men.

Key conclusions
- **80% of women in IT are satisfied with their workplace** and nearly 90% consider it better than their previous job. This is due to the high salaries, which increase with each successive employer.
- **9 out of 10 women would repeat their choice of career path** and only one out of 20 respondents would again consider a career outside IT.
- **Two-thirds of women working in IT see cybersecurity as an attractive industry specialisation**. More than half of female students are interested in this area as a potential career path.
- **More than 90% of women working in cybersecurity** recommend this specialisation to others, especially recommending compliance, data privacy, auditing and risk management.

Paradoxically, an industry as modern as IT is not free of gender inequality issues. They have no reason for existence, apart from stereotypes. The situation is slowly changing for the better, but it is still there.

- **40% of female students** question their competencies, believing that men have a greater aptitude in IT. It is only at their career stage in the industry that women begin to see that they were wrong.
- **Nearly 50% of women in cybersecurity and one in three working in IT were treated less favourably than men.** Above all, women face a lack of confidence on the part of the opposite sex, and their competencies are often called into question simply because they are female.
- **As many as ¼ of women** in cybersecurity complain of being given tasks not compatible with their skills.
- **There is still a disparity in earnings by gender.** Despite general satisfaction with their salaries, more than half of women feel that they earn less than professionals of the opposite sex with

similar work experience.
- **More than 50% of the women** surveyed believe that men in IT have a better chance of promotion and career development.

One thing is certain: the low number of women in cybersecurity and IT is not due to a lack of skills but to a lack of confidence in their abilities and an unsuitable educational profile. It is, therefore, necessary to take measures to eliminate harmful gender stereotypes and predispositions (unfortunately, often perpetuated by families and teachers) and to raise awareness of the benefits of employment in the technology sector already at the early stages of education. The increased presence of women in IT has the potential to change the image of the industry and give it a new growth direction, where strong soft skills and a wide view from the borderline of different specialisations will count alongside technical and scientific skills.

Why do women go for the IT industry?
Most women entered the IT industry already during their professional careers. They tended

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What emotions do you feel when you think about your work in IT so far?

WOMEN IN THE IT INDUSTRY, INVOLVED WITH CYBERSECURITY

- **acceptance** is a key emotion - pointed out by 56% of women, more often felt in cybersecurity than in other areas of IT
- of the remaining positive emotions, the following are: **fun of working** - 42% (significantly more often in cybersecurity than for women in other IT areas), **curiosity** - 36%, **calm** - 32%, **admiration** - 16%
- after years of working in the cybersecurity field, **boredom** is also apparent - 20%, **predictability** - 14%, as well as a **concern** if anything unforeseen will undermine the work - 16%
- **the most negative emotions are marginal**, with the majority indicated by less than 5% of those surveyed

to be motivated to make the switch by high salaries (40%) and the prospects of growth of the technology industry, implying ease of finding work. The possibility of working remotely - even before the pandemic became widespread - was also a factor. Interestingly, quite a large percentage of girls were already thinking about a career in IT as early as the secondary school (20%).

The greatest job satisfaction is reported by ladies employed in cybersecurity (92%). An important aspect of this domain is its innovativeness, which creates extraordinary opportunities for shaping digital reality. There is also a greater opportunity to broaden one's competencies and to take part in interesting projects, something that those employed in IT outside the security field are lacking. As one survey participant puts it: „I like my job because it is needed. I help people, optimise something, improve something and thus make the world a better place".

On average, women in IT change specialisation only once during their entire career. In cyber-

security, project manager (27%) was most frequently mentioned among the positions considered. Outside of cybersecurity, data analyst (32%) and business analyst (26%) were most frequently mentioned.

As far as the form of employment is concerned, the majority of women in IT, in both analysed segments, work full-time. Only 10 per cent of women in cybersecurity are self-employed, and even fewer in other IT domains (5 per cent), while civil law contracts (contracts for specific deliverables or types of continuous work) are more common.

Gender and working in IT

Even in a sector as modern as IT, however, there is still a perceptible disparity in salaries between men and women and a lack of gender equality manifested in the somewhat different treatment of the two sexes. This is largely due to the fact that the industry is still heavily male--dominated. For every three men working in IT there is one woman, and in cybersecurity this disparity is even greater - here there are six men for every woman. For the time being, only a small percentage of technology compa-

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What emotions do you feel when you think about your work in IT so far?

WOMEN IN THE IT INDUSTRY, NOT INVOLVED WITH CYBERSECURITY
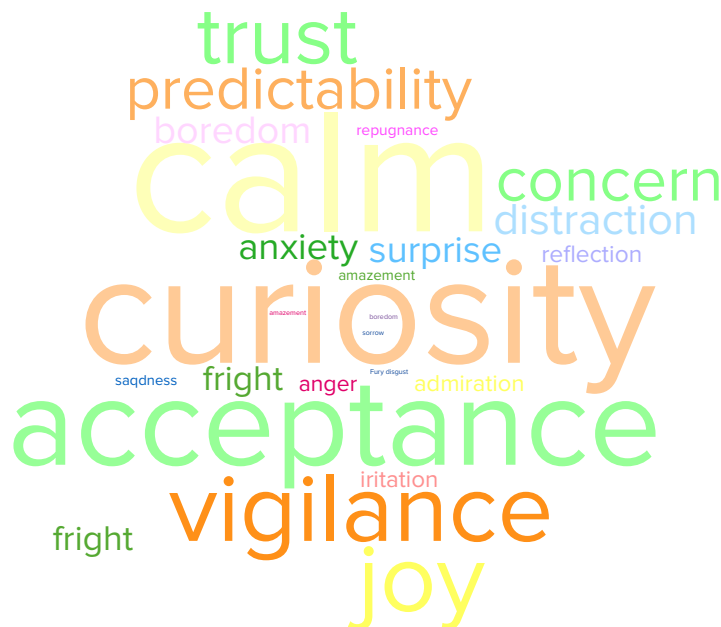
- the key emotion is **curiosity** - indicated by 47% of women
- of the remaining positive emotions, the following are: **calm** – 42%, **acceptance** – 36%, **joy** – 20% and **trust** – 18%
- they are also accompanied by **vigilance** - 22%, and after years of work, **predictability** - 15%, and **concern** - 15%
- **the most negative emotions are marginal**, with the majority indicated by less than 5% of people surveyed

What is your view of career opportunities in the IT industry?

WOMEN IN THE IT INDUSTRY, INVOLVED WITH CYBERSECURITY
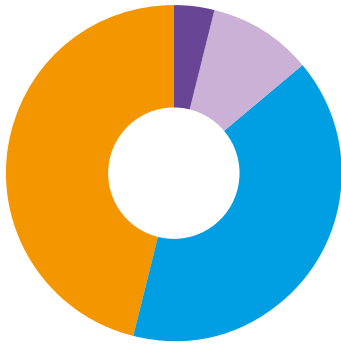
DATA IN %

VERY DISSATISFIED	-
SOMEWHAT DISSATISFIED	4
NEITHER SATISFIED NOR DISSATISFIED	10
SOMEWHAT SATISFIED	40
VERY SATISFIED	46

WOMEN IN THE IT INDUSTRY, NOT INVOLVED WITH CYBERSECURITY

DATA IN %

VERY DISSATISFIED	2
SOMEWHAT DISSATISFIED	4
NEITHER SATISFIED NOR DISSATISFIED	15
SOMEWHAT SATISFIED	49
VERY SATISFIED	31

How does gender inequality materialise in the IT industry?

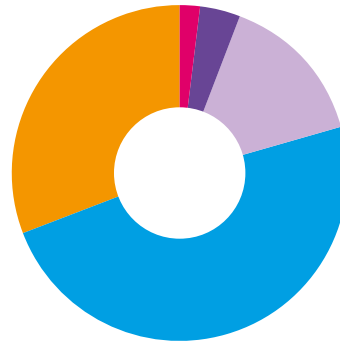| WOMEN IN THE IT INDUSTRY, INVOLVED WITH CYBERSECURITY			WOMEN IN THE IT INDUSTRY, NOT INVOLVED WITH CYBERSECURITY
64		LIMITED CONFIDENCE IN THE SKILLS OF WOMEN IN IT IS NOTICEABLE	67
68		WOMEN ARE TREATED AS LESS COMPETENT \ THEIR COMPETENCIES ARE CALLED INTO QUESTION	58
59		WOMEN EARN LESS THAN MEN	58
55		WOMEN HAVE LIMITED OPPORTUNITIES OR FACE DIFFICULTIES IN GAINING PROMOTION	50
45		CHAUVINISTIC OR SEXIST JOKES ARE MORE COMMON TOWARDS WOMEN	42
32		WOMEN ARE GIVEN SIMPLER, LESS COMPLEX TASKS	33
18		MOBBING IS MORE COMMON TOWARDS WOMEN	33
18		WOMEN ARE GIVEN LESS ATTRACTIVE TASKS, WHICH DO NOT ALLOW THEM TO SHOW THEIR FULL SKILLS	29
27		WOMEN DO NOT GET COMPLETE PROJECTS, ONLY PARTS OF ASSIGNMENTS	21

DATA IN %

nies (10%) are close to gender parity in terms of employment.

The situation is similar at universities. There is a clear predominance of men in science-related subjects (mathematics, physics), with one woman for every four men, three men for every woman in cybersecurity-related faculties, and equal proportions in faculties combining IT with managerial skills (administration, management).

More than 40% of women in IT and cybersecurity report that they are treated less favourably than their male colleagues: they are paid less, they are promoted less often, and their skills are questioned at work by assigning them simpler and less ambitious tasks or small parts of projects. Admittedly, this tends to happen at the beginning of a career and women who have built up their position as professionals over time can expect equal treatment. As one female participant in the survey puts it: „After

Working in cybersecurity through the eyes of women

- cybersecurity is an area where women perform as well as in any other
- given the hardship and effort it takes to get started in IT, women with aspirations want to see the results of their work, they want to be noticed, and to be appreciated
- the constant pressure to prove to oneself that one is good enough to work in the IT sector, which is still so male-dominated, makes this pressure very strong
- according to some women, security in IT is „ a boring area" because:
    "no events is a success and therefore no successes can be seen"
    "the progress of the work cannot be observed"
    "the work is very reproducible"

What makes you unhappy in your work?

WOMEN IN THE IT INDUSTRY,
INVOLVED WITH CYBERSECURITY

BASE SALARY AMOUNT	16
BONUS AMOUNT	16
NO INTELLECTUAL CHALLENGES OR CONCEPTUAL WORK	16
POOR RELATIONS WITH SUPERIORS	16
LACK OF WORK-LIFE BALANCE / TOO MUCH WORK	14
NO OPPORTUNITIES FOR DEVELOPMENT, COMPETENCES GROWTH	12
THE TREATMENT OF WOMEN IN IT	12
NO ACCESS TO PRIVATE MEDICAL CARE	10
NO INTERESTING PROJECTS	10
TEAM I WORK WITH/IN	10
THE LOCATION OF THE OFFICES	10
POOR RELATIONS / COMPANY MORALE	10
FREQUENT OVERTIME	10
THERE IS NO SUCH THING	24

What makes you unhappy in your work?

WOMEN IN THE IT INDUSTRY,
NOT INVOLVED WITH CYBERSECURITY

BASE SALARY AMOUNT	33
BONUS AMOUNT	25
FREQUENT OVERTIME	16
LACK OF WORK-LIFE BALANCE / TOO MUCH WORK	15
POOR RELATIONS / COMPANY MORALE	13
NO INTELLECTUAL CHALLENGES OR CONCEPTUAL WORK	11
NO ACCESS TO PRIVATE MEDICAL CARE	11
THE LOCATION OF THE OFFICES	11
NO OPPORTUNITIES FOR DEVELOPMENT, COMPETENCES GROWTH	9
POOR RELATIONS WITH SUPERIORS	7
THE TREATMENT OF WOMEN IN IT	7
OFFICE AND WORKSTATION EQUIPMENT	7
NO GYM CARDS AVAILABLE	7
THERE IS NO SUCH THING	20

DATA IN %

The gender competency gaps in IT as seen by women

- **CREATIVE** - THEY HAVE INTERESTING IDEAS, THINKING OUT OF THE BOX CONCERNING THEIR ACTIONS AND BEHAVIOURS
- **ABLE TO SPLIT ATTENTION (MULTITASKING)** - ABLE TO DO MORE THAN ONE TASK AT A TIME, NOT SHYING AWAY FROM ADDITIONAL TASKS
- **WELL-EDUCATED** - THOROUGH KNOWLEDGE OF THE JOB TO BE UNDERTAKEN, SUPPORTED BY EXPERIENCE IN INTERNSHIPS
- **SPECIALISTS** - GENERALLY MORE COMPETENT THAN REQUIRED FOR THE JOB, FOCUS ON CONTINUOUS TRAINING AND SELF-DEVELOPMENT
- **ACCURATE** - A CHARACTERISTIC PARTICULARLY SOUGHT AFTER IN THE IT SECTOR

- **CONFIDENT** - NOT ALWAYS LEGITIMATELY SO
- **TECHNICAL** - THEY HAVE THEIR OWN WORLD, WHICH IS THEIR HOBBY
- **SECRETIVE** - THEY HAVE LESS DEVELOPED SOFT COMPETENCIES, IT IS MORE OFTEN DIFFICULT TO REACH THEM, LEARN SOMETHING FROM THEM
- **VERY KNOWLEDGEABLE** - OFTEN WITHIN A NARROW AREA, BUT RESEARCHED AND STUDIED

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a year or so, the guys realised that I had surpassed them in certain things, that I was doing certain tasks faster. I never named it explicitly, but it would come out by itself when handing in reports, the manager would praise my analyses and then they would split into two groups. Some started to treat me as an authority and some as a threat."

It is worth noting that lower wages and a longer promotion path are not just a matter of strongly rooted stereotypes. They are also due to longer periods of absence for young women on parental leave.

Gender also determines a lot of positives for the industry itself. Women feel their influence,

In what areas / specialties of IT do you think women have the greatest opportunity to build their careers?

ACCORDING TO FEMALE STUDENTS IN IT-RELATED FACULTIES/SPECIALISATIONS

DATA ANALYST	36	IT SYSTEMS ADMINISTRATOR	10
BUSINESS ANALYST	30	IT SYSTEMS SOFTWARE ARCHITECT	10
DATABASE ADMINISTRATOR	25	WEB DEVELOPER	10
SYSTEM ANALYST	25	SERVER ADMINISTRATOR	8
TESTER	22	FRONT-END DEVELOPER	8
IT PROJECT MANAGER	18	IT SECURITY ENGINEER	8
DATA PROTECTION/CYBERSECURITY SPECIALIST	18	INFORMATION SYSTEMS SECURITY SPECIALIST	8
IT CONSULTANT	17	BUSINESS INTELLIGENCE DEVELOPER	7
NETWORK ADMINISTRATOR	16	SOFTWARE QUALITY ENGINEER	7
HELP DESK SPECIALIST	16	SYSTEMS ENGINEER	7
SOFTWARE DEVELOPER	16	WEBMASTER	7
NETWORK ARCHITECT	13	BACK-END DEVELOPER	6
COMPANY DEVICES ADMINISTRATOR	11	SOFTWARE ENGINEER	6
TECHNICAL SUPPORT CONSULTANT	11	DEVOPS ENGINEER	5
NETWORK OPERATOR	11		

DATA IN %

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which can be seen in the change in behaviour of men, who are now beginning to be more tactful.

The predisposition of women to work in IT and cybersecurity

Women bring soft skills and such natural qualities as divided attention, attention to detail, inquisitiveness and communication skills to IT. They enable them to build good team relations. Women's skills that can be successfully used in IT are, first and foremost:

- building a workplace atmosphere - a more collaborative, less antagonistic environment;
- holistic approach to problems - better, comprehensive business analysis;
- the use of richer language - fuller narrative, more informative descriptions, detailed summaries;
- recruitment competencies - more insightful look at the candidate, empathy;

- a thorough education - often in more than one domain of science;
- perseverance and self-development.

In some areas of IT, especially cybersecurity, women's natural vigilance and preemptiveness are beneficial to developing a career in this field. The security-related specialisations where ladies can best use their innate predisposition are mainly: compliance (42%), data privacy (42%), audit (40%), risk management (40%), incident response (36%), red team (32%) and anti-fraud departments (32%).

It can be said that there is no area of IT operations in which women do not perform well, helped by their innate predispositions. There is one exception: the most difficult area for women to succeed in is software development, which is still the male domain. Women who choose the software developer profession need to be particularly self-confident and resistant to stress. But once they have succeeded in this hermetic environment, they enjoy special esteem.

Women can be given even more encouragement to work in IT

Women know that by choosing an IT-related field of study, they are entering a ‚male territory'. Nevertheless, many of them decide to take this step. The main way to convince women about cybersecurity could be through awareness-raising activities in the early stages of education. The main idea is to eliminate the stereotype that men have more ‚scientific minds' and are better predisposed to technical sciences.

The results of the survey ‚Women in IT and cyber security' show that the majority of women who have chosen to work in IT are satisfied with their choice. A significant proportion of them (40%) made the decision to ultimately get involved with the IT industry at an early stage in their life or education. For one in four women surveyed, a job in IT is the fulfilment of a dream or the finalisation of a decision made when they were still in secondary school, and sometimes even in primary school.

By choosing to specialise in IT while studying, women are already fully aware that it is a fast-growing industry, offering job stability with competitive rates of pay. One of the main motivations cited by survey participants for entering IT and cybersecurity is the expected salary level.

At the same time, women are generally satisfied with their IT studies as such - 41% of female students expressed no objections to their IT studies. The greatest dissatisfaction, reported by one in five female students, is the priority of theory over practice. One in ten female students, on the other hand, had objections to student relations and the quality of the academic teaching staff.

The female students perfectly understand that their decision to choose their studies and careers is future-oriented and opens up great possibilities for their future professional development.

What are you satisfied with in terms of IT-related field of study?

FEMALE STUDENTS IN IT-RELATED
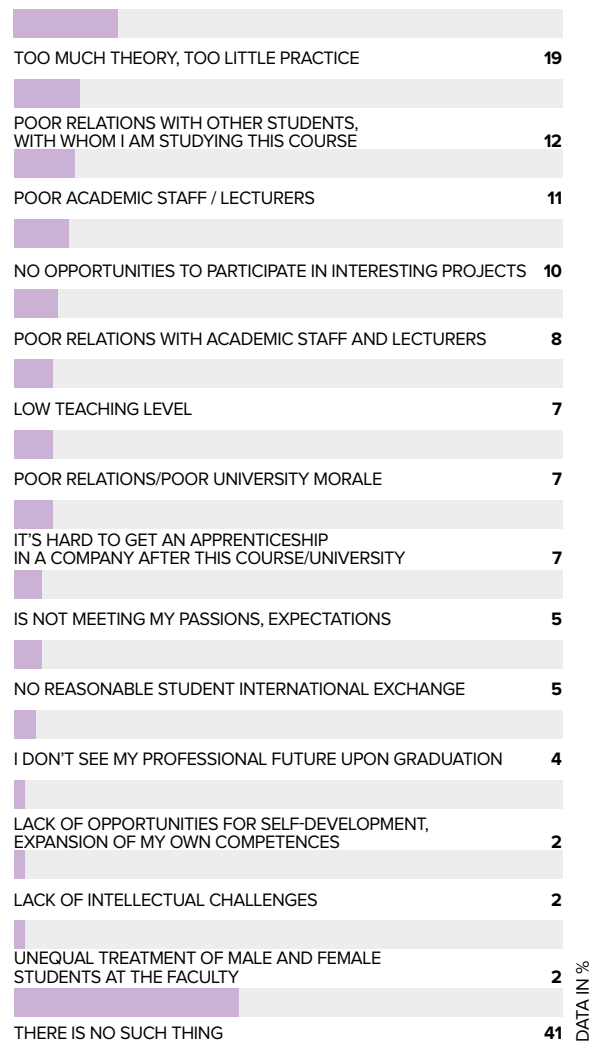FACULTIES / SPECIALISATIONS

IT IS A FUTURE-ORIENTED DOMAIN	39
RELATIONS / ATMOSPHERE AT THE UNIVERSITY	25
IT FITS WITH MY PASSIONS, EXPECTATIONS	24
OPPORTUNITIES TO PARTICIPATE IN INTERESTING PROJECTS	23
HIGH LEVEL OF INSTRUCTION	22
OPPORTUNITIES FOR SELF-DEVELOPMENT, BROADENING OF SKILLS	22
RELATIONS WITH OTHER STUDENTS STUDYING THIS COURSE	19
INTELLECTUAL CHALLENGES	18
GOOD ACADEMIC STAFF / LECTURERS	16
A PROPER MIX OF THEORETICAL AND PRACTICAL TEACHING	16
EQUAL TREATMENT OF MALE AND FEMALE STUDENTS	16
EASE OF OBTAINING AN APPRENTICESHIP WITH COMPANIES FOLLOWING THIS COURSE/UNIVERSITY	13
RELATIONS WITH ACADEMIC STAFF / LECTURERS	11
INTERNATIONAL STUDENT EXCHANGES WITH VALUABLE ORGANISATIONS AROUND THE WORLD	8
THERE IS NO SUCH THING	8

What are you dissatisfied with in terms of IT-related field of study?

FEMALE STUDENTS IN IT-RELATED
FACULTIES / SPECIALISATIONS

TOO MUCH THEORY, TOO LITTLE PRACTICE	19
POOR RELATIONS WITH OTHER STUDENTS, WITH WHOM I AM STUDYING THIS COURSE	12
POOR ACADEMIC STAFF / LECTURERS	11
NO OPPORTUNITIES TO PARTICIPATE IN INTERESTING PROJECTS	10
POOR RELATIONS WITH ACADEMIC STAFF AND LECTURERS	8
LOW TEACHING LEVEL	7
POOR RELATIONS/POOR UNIVERSITY MORALE	7
IT'S HARD TO GET AN APPRENTICESHIP IN A COMPANY AFTER THIS COURSE/UNIVERSITY	7
IS NOT MEETING MY PASSIONS, EXPECTATIONS	5
NO REASONABLE STUDENT INTERNATIONAL EXCHANGE	5
I DON'T SEE MY PROFESSIONAL FUTURE UPON GRADUATION	4
LACK OF OPPORTUNITIES FOR SELF-DEVELOPMENT, EXPANSION OF MY OWN COMPETENCES	2
LACK OF INTELLECTUAL CHALLENGES	2
UNEQUAL TREATMENT OF MALE AND FEMALE STUDENTS AT THE FACULTY	2
THERE IS NO SUCH THING	41

DATA IN %

University relations

Working in IT is mostly a combination of passion and rationality. Women feel that they are doing what they like, what they feel good about and what they find interesting. The rapidly changing world of technology means that they have constant opportunities for development and self-improvement.

Female students believe that the greatest potential for women in IT is in analytical, data science-related positions. Only one in four mentions positions directly related to cybersecurity in this context.
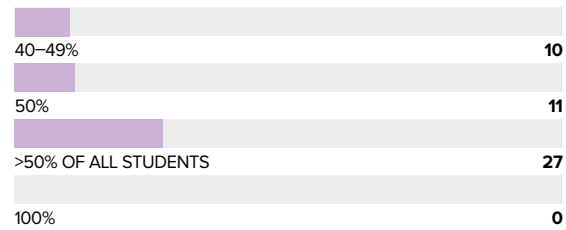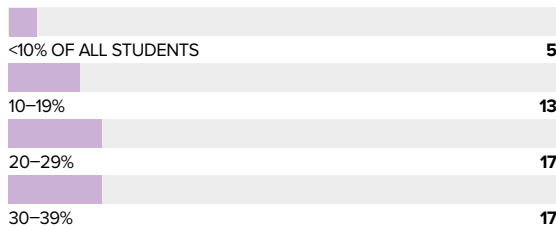
Women know that by choosing an IT-related field of study, they are entering ‚male territory'. Nevertheless, many of them choose such faculties. On average, women account for 39% of the total number of students in IT specialisations. In cybersecurity, there is one woman for every three men.

Almost ¾ of female students feel they are treated equally to men. Meanwhile, women already working in IT say that they are faced with a lack of trust from the opposite sex, their competencies are often questioned simply by virtue of them being a woman, and it is relatively common at the beginning of careers to be assigned to very simple tasks with no risk of failure. 1/4 of women in cybersecurity complain about being given tasks that do not match their skills and believe that women's involvement in conceptual work is being limited.

The female students, however, have a slightly different perspective: nearly three-quarters of them feel that there is equality in IT-related courses and that cases, where women are treated differently from men, are marginal. Sporadic cases of discrimination against women at university are, according to the survey participants, the domain of old guard lecturers.

What percentage of students in your faculty are women?

FEMALE STUDENTS IN IT-RELATED FACULTIES / SPECIALISATIONS

<10% OF ALL STUDENTS	**5**
10–19%	**13**
20–29%	**17**
30–39%	**17**

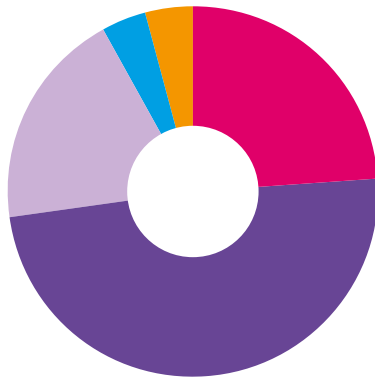|	
40–49%	**10**
50%	**11**
>50% OF ALL STUDENTS	**27**
100%	**0**

DATA IN %

THERE IS A CLEAR PREVALENCE OF MEN IN TYPICALLY SCIENCE-RELATED SUBJECTS,
WHILE IN SUBJECTS COMBINING IT WITH MANAGERIAL SKILLS THE PROPORTIONS ARE EVENLY BALANCED.

Do women and men in the IT-related course you are studying receive equal treatment?

FEMALE STUDENTS IN IT-RELATED
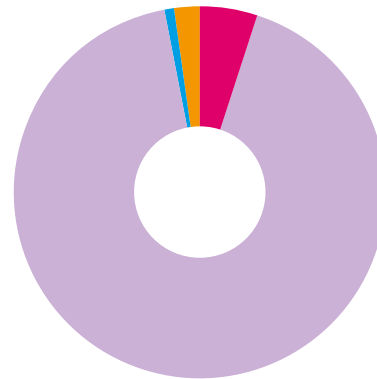FACULTIES / SPECIALISATIONS

DATA IN %

	DEFINITELY YES	24
	SOMEWHAT YES	49
	NEITHER YES NOR NO	19
	SOMEWHAT NOT	4
	DEFINITELY NOT	4

Are women in the IT-related course you are studying treated better or worse than men?

FEMALE STUDENTS IN IT-RELATED
FACULTIES / SPECIALISATIONS

DATA IN %

	DEFINITELY BETTER	5
	SOMEWHAT BETTER	0
	COMPARABLY	91
	SOMEWHAT WORSE	1
	DEFINITELY WORSE	2

Career path

One noticeable problem is that women in IT, at least at the beginning of their careers, lack self-confidence. Nearly 40 per cent of female students doubt their competencies, believing that men are more predisposed to IT. It is only at the career stage in the industry that women begin to see that they were wrong before. Meanwhile, the key to success in the industry is determination.

"Women don't have that confidence and they feel that they have to know something in 100% in order to start working, whereas men don't have that need in their heads and simply if they know at least a little bit about something, they are already applying, coming forward to participate in ideas because they know they will learn on the go. A woman, on the other hand, if she doesn't know the issue 100%, won't come forward and because of that, we are losing out. Women are often held back by the fact that

they don't feel competent enough to go for something," said one of the women participants in the study.

„I've had a few situations where I haven't been able to present my ideas with full conviction and to stand up for myself. A man, when he comes to a meeting, says: I'm going to do it this way. I, on the other hand, spend a lot of time convincing, I do SWOT analyses and I focus on that, but I lack self-confidence," said another female survey participant.

Nearly half of women also feel that there are areas in IT where they can do better than men.

More than 2/3 of women working in IT see cybersecurity as a potentially attractive industry specialisation, and more than 3/4 of those involved with cybersecurity see it as attractive from a professional perspective. Only 1/3 of IT women not involved with cybersecurity do not see

Do you find working in cybersecurity attractive?
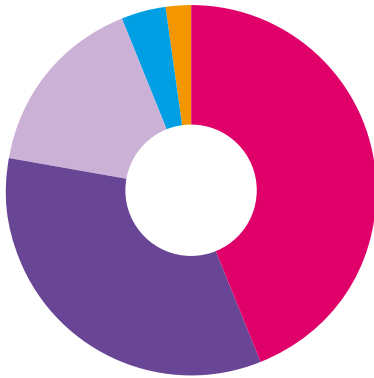
WOMEN IN THE IT INDUSTRY, INVOLVED WITH CYBERSECURITY

	DEFINITELY YES	44
	SOMEWHAT YES	34
	NEITHER YES NOR NO	16
	SOMEWHAT NOT	4
	DEFINITELY NOT	2

DATA IN %

WOMEN IN THE IT INDUSTRY, NOT INVOLVED WITH CYBERSECURITY

	DEFINITELY YES	13
	SOMEWHAT YES	38
	NEITHER YES NOR NO	27
	SOMEWHAT NOT	15
	DEFINITELY NOT	7

DATA IN %
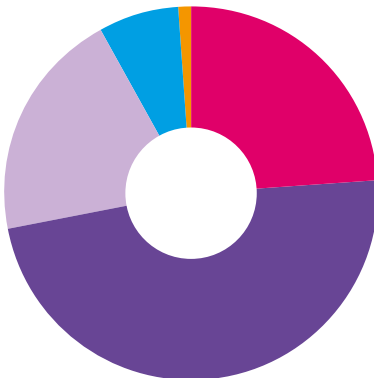
FEMALE STUDENTS IN IT-RELATED FACULTIES / SPECIALISATIONS

	DEFINITELY YES	24
	SOMEWHAT YES	48
	NEITHER YES NOR NO	20
	SOMEWHAT NOT	7
	DEFINITELY NOT	1

DATA IN %

Do you find working in cybersecurity attractive?

WOMEN IN THE IT INDUSTRY, INVOLVED WITH CYBERSECURITY

COMPUTER SCIENCE / ROBOTICS AND RELATED	**39**
LINGUISTICS	**24**
ADMINISTRATION / MANAGEMENT	**22**
ECONOMICS	**18**
CYBERSECURITY	**14**
LAW	**6**
LOGISTICS	**4**
MATHEMATICS / PHYSICS	**4**

WOMEN IN THE IT INDUSTRY, NOT INVOLVED WITH CYBERSECURITY

COMPUTER SCIENCE / ROBOTICS AND RELATED	**38**
LINGUISTICS	**18**
ADMINISTRATION / MANAGEMENT	**16**
ECONOMICS	**12**
CYBERSECURITY	**12**
LAW	**8**
LOGISTICS	**8**
MATHEMATICS / PHYSICS	**6**
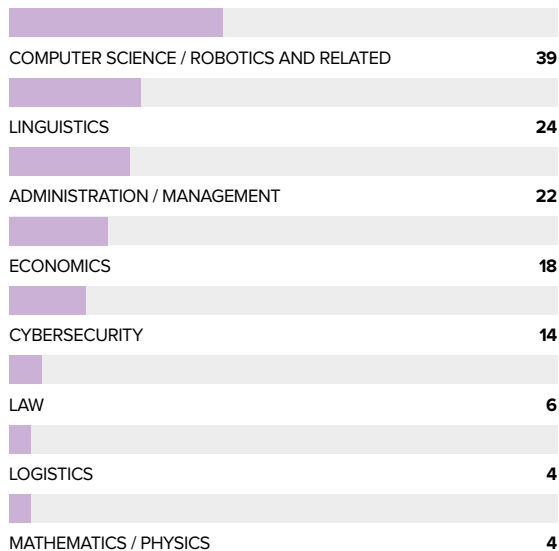
DATA IN %

Women in IT and cybersecurity
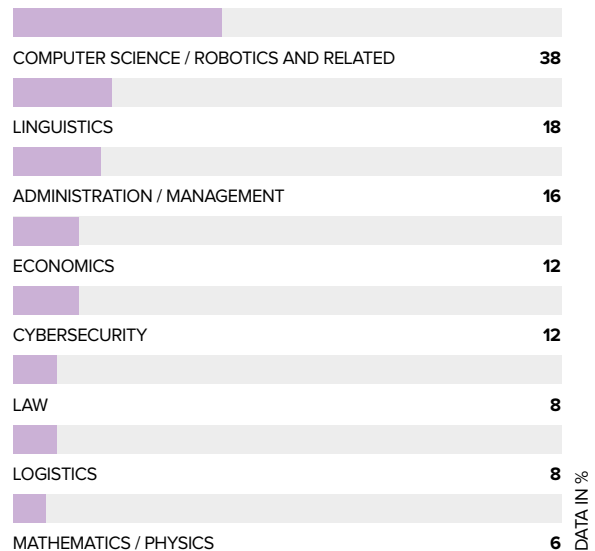
Activities to prepare women for studies and work in IT

EXISTING	TO BE IMPLEMENTED
ACTION DAY FOR GIRLS – **GIRLS TO TECHNICAL UNIVERSITIES**, SHOWING THAT TECHNICAL EDUCATION IS ALSO FOR WOMEN	**NO GENDER STEREOTYPING** - EVERY CHILD CAN DO WHAT THEY WANT, GROW THEIR PASSIONS AND INTERESTS
CAREER PROGRAMMES AND ATTRACTIVE INTERNSHIPS AS PART OF STUDIES – OPPORTUNITIES TO LEARN ABOUT THE INDUSTRY	**ADEQUATE EDUCATION** – HIGH-QUALITY COMPUTER SCIENCE FROM PRIMARY SCHOOL ONWARDS
FOUNDATIONS SUPPORTING WOMEN IN AREAS RELATED TO TECHNICAL ACTIVITIES – E.G. THE PERSPECTIVES FOUNDATION	**RECRUITMENT PROCESSES IN A NEW ORDER** - FOCUSED NOT ONLY ON THE TECHNICAL ASPECTS OF THE JOB, BUT ON ALL SKILLS

themselves in this specialisation, while already more than half of the female students are interested in this area as a potential career path. For 72% of female students, cybersecurity is an attractive area from a professional perspective.

Competencies and attitudes
Women in IT and cybersecurity today do not feel being treated as well as men. In their opinion, they are far less likely to occupy prestigious positions, or slower to reach managerial positions.

However, this does not change the fact that future outlooks are regarded overwhelmingly positively by women. **Cybersecurity is seen as a good place for women.** In particular, the ability of women to find their way in any situation, a conciliatory approach and a softer tone of voice are all factors that are important in building a cybersecurity environment. Women are naturally gifted with qualities that make it easier for them to build relationships, to establish threads of understanding. These, they say, make work less tiring and turn everyday problems into challenges.

Feminine thoroughness, insight and getting to the heart of a problem are definite advantages. In addition, women are constantly improving their qualifications and competencies, and this gives them a lot of room for excelling in the area of cybersecurity. Most women working in IT believe that it is not the gender, but the skills that determine the predisposition to succeed in a job.

Women are aware that success in cybersecurity depends as much on the specific environment in which they work as on themselves. Women's attitudes towards the male working environment are of considerable importance here. If they are assertive, want to learn, and want to expand their knowledge, nothing will stand in their way of self-fulfilment and building a career path.

„Just coming into existence was difficult, but I knew I wanted to. I knew how technology was developing and the risks that could come from that. Therefore, I knew I wanted to go into cybersecurity. Consistently, step by step, because I wanted to look after security, I managed to build my career," - said one of the female specialists during the interview.
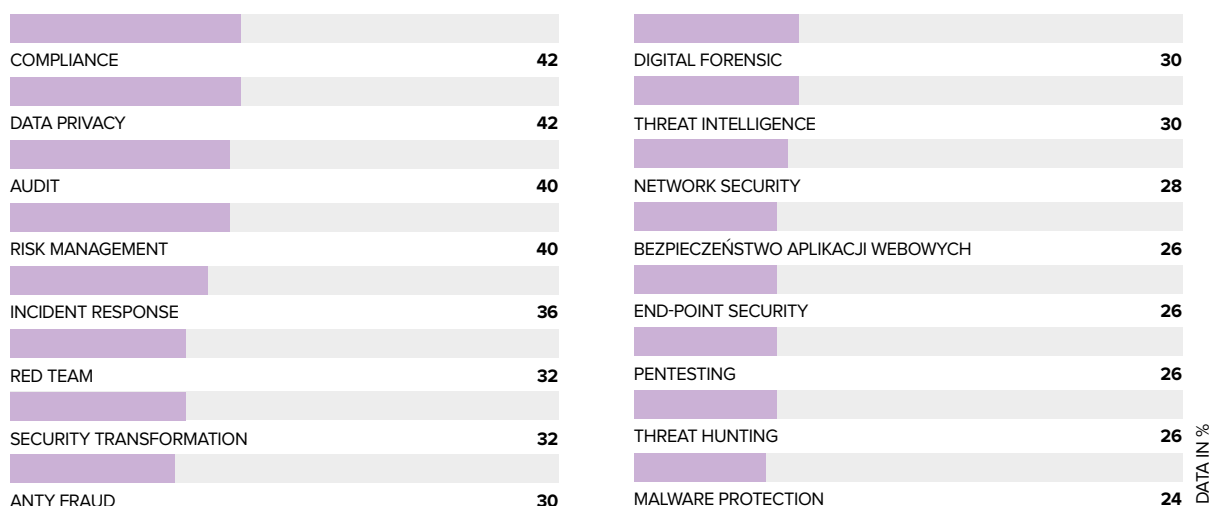
Noticing and encouraging
The main way to convince women about cybersecurity is through awareness-raising activities in the early stages of education. This is primarily to eliminate the stereotype that men have more ,technical minds' and predispositions. Encouragement measures are also needed for women considering a career in IT generally.

According to the survey participants, the best incentive is simply to acknowledge and appreciate women working in the industry. This can be achieved, among other things, by including feminatives in conversations about IT and in job offers. This would send a clear signal to women that the industry welcomes them too, that they are important, and that they matter. It is also good practice to showcase the profiles of women in the industry who are well-known and respected. Training on how to build up one's own brand in the IT environment, highlighting the characteristics typical of women, can be of great importance.
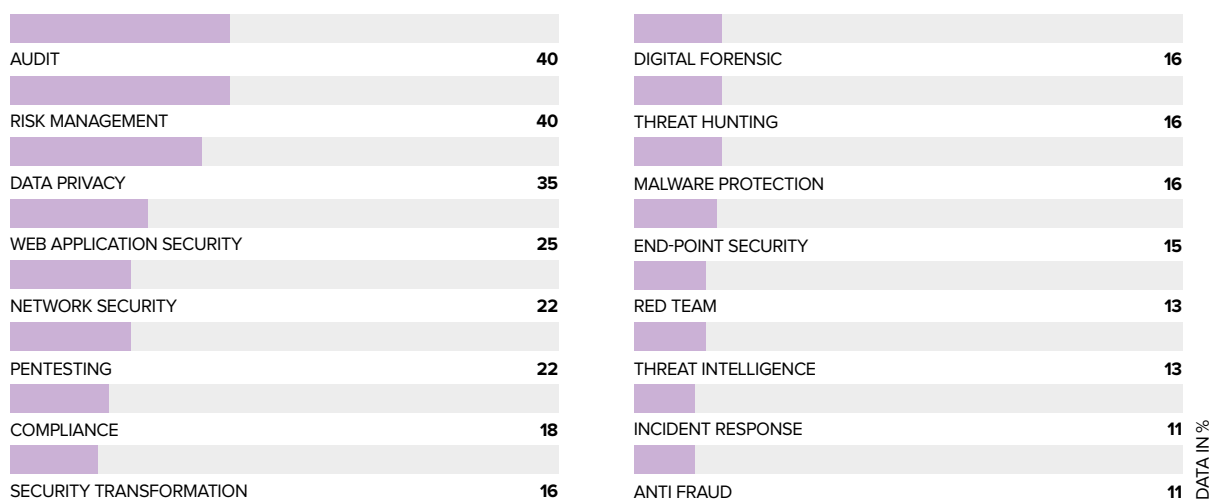
The interest in IT and cybersecurity is also influenced, according to the women participa-

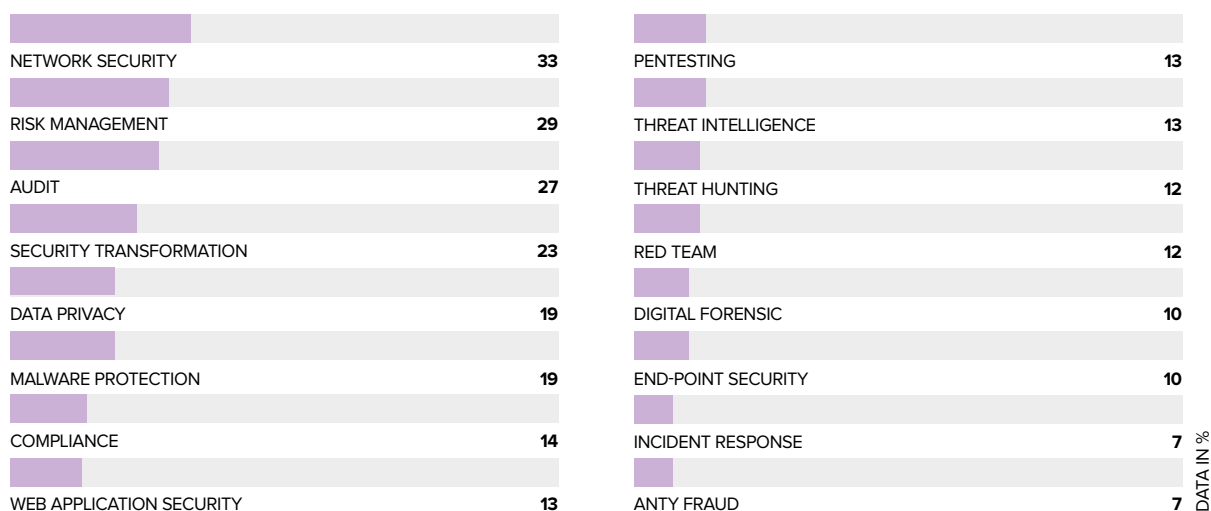## What, if anything, could encourage women to work in cybersecurity?

WOMEN IN THE IT INDUSTRY, INVOLVED WITH CYBERSECURITY

COMPLIANCE	42
DATA PRIVACY	42
AUDIT	40
RISK MANAGEMENT	40
INCIDENT RESPONSE	36
RED TEAM	32
SECURITY TRANSFORMATION	32
ANTY FRAUD	30

DIGITAL FORENSIC	30
THREAT INTELLIGENCE	30
NETWORK SECURITY	28
BEZPIECZEŃSTWO APLIKACJI WEBOWYCH	26
END-POINT SECURITY	26
PENTESTING	26
THREAT HUNTING	26
MALWARE PROTECTION	24

DATA IN %

WOMEN IN THE IT INDUSTRY, NOT INVOLVED WITH CYBERSECURITY

AUDIT	40
RISK MANAGEMENT	40
DATA PRIVACY	35
WEB APPLICATION SECURITY	25
NETWORK SECURITY	22
PENTESTING	22
COMPLIANCE	18
SECURITY TRANSFORMATION	16

DIGITAL FORENSIC	16
THREAT HUNTING	16
MALWARE PROTECTION	16
END-POINT SECURITY	15
RED TEAM	13
THREAT INTELLIGENCE	13
INCIDENT RESPONSE	11
ANTI FRAUD	11

DATA IN %

FEMALE STUDENTS IN IT-RELATED FACULTIES / SPECIALISATIONS

NETWORK SECURITY	33
RISK MANAGEMENT	29
AUDIT	27
SECURITY TRANSFORMATION	23
DATA PRIVACY	19
MALWARE PROTECTION	19
COMPLIANCE	14
WEB APPLICATION SECURITY	13

PENTESTING	13
THREAT INTELLIGENCE	13
THREAT HUNTING	12
RED TEAM	12
DIGITAL FORENSIC	10
END-POINT SECURITY	10
INCIDENT RESPONSE	7
ANTY FRAUD	7

DATA IN %

ting in the survey, by educational background and societal mindset. Often, both family and school do not support the technical interests of young women. Parents often suggest to their daughters the faculties that are incompatible with their interests, considering these interests „inappropriate" for their gender. Boys are still more often perceived as „scien-tific minds" by their parents than girls. The effect of this, according to the participants in the study, is that women, unsure of their abilities, do not succeed in their chosen subjects. However, this can be changed through the measures that influence attitudes towards IT both among women themselves and those around them.

Purpose and methodology of the research

The research was carried out as a joint project between the Cyber Women Community and Standard Chartered, with the involvement of Brainlab as the contractor for the quantitative and qualitative part of the survey. The main objective of the project was to understand the position and situation of women working in the IT industry, with a particular focus on the domain of cybersecurity. The research was also intended to provide an understanding of the perceptions about the industry among female students in IT--related fields of study or specialisations.

The survey included women working in the IT industry - both involved and not involved with cybersecurity - as well as women studying IT-related faculties and specialisations - considering getting jobs in IT both within and outside of the cybersecurity domain.

During the first stage, 12 expert interviews were conducted remotely (online) with women working in the IT industry - both involved and not involved with cybersecurity - and with female students of IT-related faculties / specialisations.
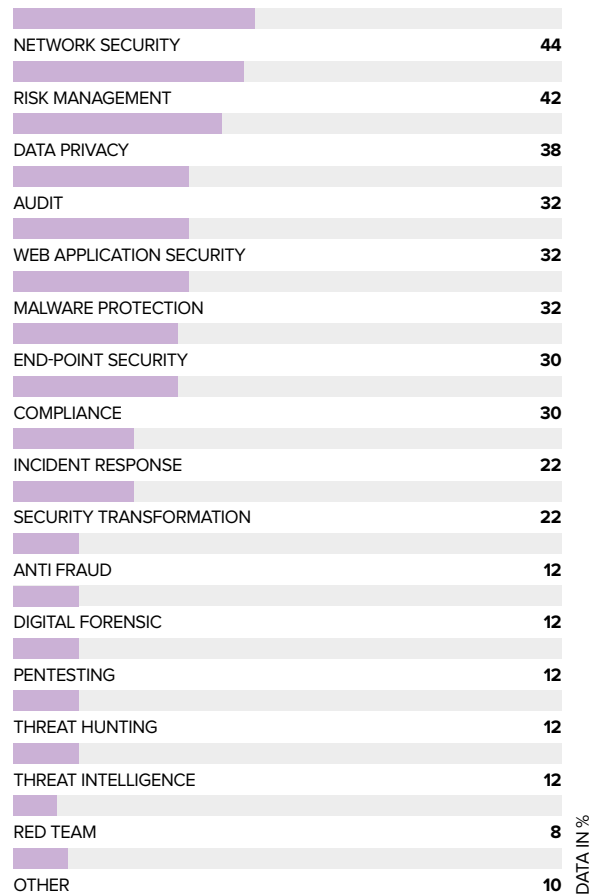
The second stage involved a quantitative survey conducted online. A total of 218 women participated, again from the same groups as before.

The survey found that around 90% of female IT employees have a university degree (94% in cybersecurity roles and 89% outside of cybersecurity). The majority have a master's degree (48% and 42% respectively). A small percentage (6% and 2%) have a PhD or other degree. In contrast, those with secondary education are currently in the process of continuing their education at universities.

The domains in which female cybersecurity employees most often work are network security (44%), risk management (42%) and data privacy (38%). In contrast, the largest number of female cybersecurity survey participants work as IT project managers (22%), data protection/cybersecurity specialists (22%) and security engineers (14%).
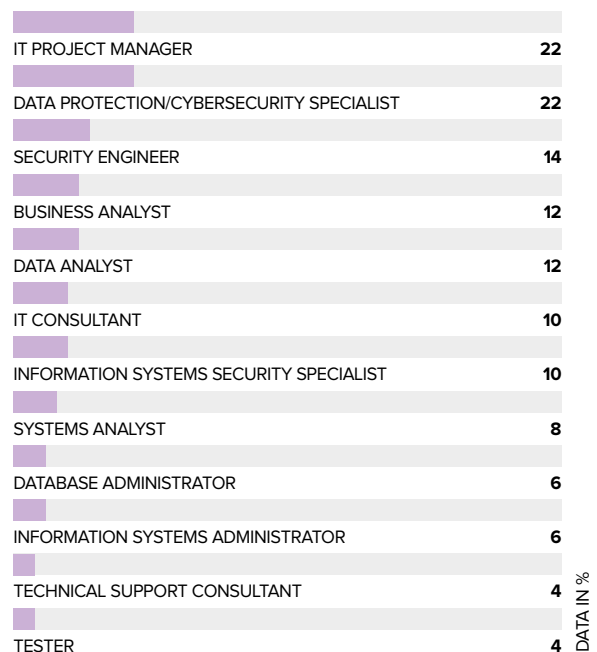
What areas of cybersecurity is your work currently related to?

WOMEN IN THE IT INDUSTRY,
INVOLVED WITH CYBERSECURITY

NETWORK SECURITY	44
RISK MANAGEMENT	42
DATA PRIVACY	38
AUDIT	32
WEB APPLICATION SECURITY	32
MALWARE PROTECTION	32
END-POINT SECURITY	30
COMPLIANCE	30
INCIDENT RESPONSE	22
SECURITY TRANSFORMATION	22
ANTI FRAUD	12
DIGITAL FORENSIC	12
PENTESTING	12
THREAT HUNTING	12
THREAT INTELLIGENCE	12
RED TEAM	8
OTHER	10

DATA IN %

Which of the following IT positions do you currently work in?

WOMEN IN THE IT INDUSTRY,
INVOLVED WITH CYBERSECURITY

IT PROJECT MANAGER	22
DATA PROTECTION/CYBERSECURITY SPECIALIST	22
SECURITY ENGINEER	14
BUSINESS ANALYST	12
DATA ANALYST	12
IT CONSULTANT	10
INFORMATION SYSTEMS SECURITY SPECIALIST	10
SYSTEMS ANALYST	8
DATABASE ADMINISTRATOR	6
INFORMATION SYSTEMS ADMINISTRATOR	6
TECHNICAL SUPPORT CONSULTANT	4
TESTER	4

DATA IN %

Piotr Borkowski, **Head of Red Team Operations & ICS Testing, Standard Chartered**

" The IT and cyber worlds have always been very broad and vast. Thanks to the change in their perception that is taking place, many people have the chance to experience this more and more. The industry offers the opportunity to pursue many specialisations, express views or to learn from many different experiences. As part of building cybersecurity in the broadest sense, at Standard Chartered we often run complex projects, in many cases managed by women, with great success! What makes me very happy is the growing interest in our industry among female students and women who have had their first years of experience in the IT industry. What they have in common is ambition; they are focused on their continuous development. This ‚hard' world of security is becoming increasingly dynamic and effective precisely because more and more people with a wide variety of experience are joining it. We see this every day in our team at Standard Chartered, which recognises the role of women in the cybersecurity industry, having one of the best teams of its kind in Europe - constantly evolving, becoming more and more dynamic.

The opinion of the
Cyber Women Community
female experts

Kamila Różana, **Lead, Red Team Risk, Governance & Issue Management, Standard Chartered**

" I am delighted that this report has been produced as it addresses issues that are important to women in the industry in which I am fulfilling myself as a cybersecurity expert. We are currently witnessing major changes with the increasing role of women , who are increasingly making their presence felt in the industry. The emergence of new and the evolution of existing areas of expertise are encouraging female professionals to change their career paths. In fact, the cybersecurity domain is already so broad that pe-

ople who have gained their experience in other professions can realise themselves here. I have no doubt that the cyber world is wide open to women.


Olga Budziszewska, **Security Strategy and Risk Manager, Accenture Security**

" The situation of women in the cybersecurity industry is presently very good. This is primarily due to the huge shortage of professionals and, consequently, the wide range of training and reskilling programmes available to those with solid

17

work experience who want to retrain in cybersecurity.

The extremely dynamic development of technology also favours people who are developing professionally or planning to move into cybersecurity. The most important things are motivation, determination and open-mindedness. The worst that can happen is thinking that once I've learnt something, I have to do it for the rest of my life. However, while there are no longer any differences at the industry entry-level , we are still in a clear minority at the executive level.
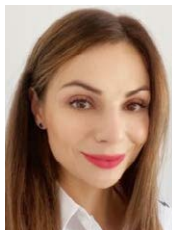
Klaudia Dutka,
Security Risk Manager, Rockwell Automation

" I am not a computer scientist by education, I studied analytical chemistry. Many of my female professional colleagues do not have a computer science background either. You don't have to be a computer scientist to start a career in cybersecurity . It is a highly interdisciplinary area, where the technical part balances with social skills. We should do more to show that cybersecurity is a discipline that offers a wide range of opportunities for growth, and to debunk its stereotype as an extremely technical area. Cybersecurity is evolving rapidly and the demand for specialists is growing at a tremendous pace. However, I would not link the qualities needed in this area to gender, it is more a matter of experience or temperament.

Zuzanna Halemejko,
Senior Manager, Forensic Technology, Ernst & Young Consulting

" I hope to see more women in the cybersecurity industry. The bottleneck is the still low proportion of women in the total number in the engineering faculties. As long as there will not be more female graduates in the labour market, the number of women in cybersecurity will not exceed a critical level and it will continue to be a male-dominated environment. We should convince other women who are at the be-

ginning of their career paths to choose engineering studies if this is something of interest to them - that it is an opportunity for them not only to make a career but also to lead a small revolution in companies and departments dealing with technology.

Małgorzata Mazurkiewicz,
Senior Auditor IT, ISACA

" Encouraging women toward cybersecurity must be something to work on from the early school years. Few people know that girls and boys assimilate knowledge differently. It's an unpopular approach, but by creating separate learning environments by gender, we are helping girls gain the courage to tackle subjects such as maths or physics. This is very important. After all, at a later stage of education, such as university, we are only reaping what we sowed at the early childhood stage. In contrast, a factor that encourages women to work (not only in IT) is employer flexibility. Women do not want to give up their families, but they also do not want to give up their dreams of a rewarding job.

Magdalena Skorupa,
Data Privacy & Compliance Director, Reckitt

" More and more women are finding the courage to explore areas that were previously reserved for men. This can be seen in recruitment processes in cybersecurity, where women are applying increasingly. The bigger challenge afterwards is for women to persevere in their choice. Doubts begin to arise: am I the right fit, is it really for me, can I be a match for my male colleagues. Women have to learn to overcome the barriers within themselves, to gain an inner conviction that they are qualified and that they will make it. Most barriers are psychological, not industry- or market-related. You don't need to have the technical knowledge to start working in cybersecurity. There are many areas - including risk management, compliance, and governance - in which one can perform equally well.

Together we can do more

Our aim is to demonstrate that cybersecurity is a domain where women can realise themselves professionally and that it is not a typically male industry. We are convinced that working in this industry is an excellent career path," said Agnieszka Wielądek, Community Manager Cyber Women Community (CWC) and Aneta Legenza, Head, Strategy & Planning, Standard Chartered.

Where did the idea for setting up a Cyber Women Community come from?

Agnieszka Wielądek: The initiative came from a group of ladies who got together two years ago at a CSO Council Christmas meeting. Some of them had been part of the security heads community for several years but were hardly visible among the self-confident gentlemen. They say there are no coincidences, but that's when they unexpectedly met at one of the round tables. It turned out that they had gained their knowledge by working for several years in various areas of cybersecurity in large organisations at home and abroad. They differed both in age and experience, but they had one thing in common: they believed that cybersecurity was an area where women could excel professionally and support each other. And two years ago, this was not a very popular view. This is how the Cyber Women Community was born.

What are the goals that the women in the cybersecurity community have set for themselves?

Agnieszka Wielądek: Our aim is to show that cybersecurity is a domain where women can fulfil themselves professionally and that it is not a typically male industry. Is it worth it? Definitely - because if you succeed, it is a source of really good earnings and great satisfaction! We also want to present women with a variety of career opportunities in this industry - from technical positions requiring IT knowledge to positions for non-techies. Actually even for people with an arts background! We also want them to know that they are not alone on this difficult career path. That there are women at the CWC who have managed to get into leadership positions and can support other ladies with their knowledge or experience.

Who can join the CWC?

Agnieszka Wielądek: Any woman interested in cybersecurity - working in it or knowing about it.

What are the ladies who participate in CWC activities gaining? What do they give to others from themselves?

Agnieszka Wielądek: Being part of the CWC allows women to share knowledge, and pursue different activities together - not only in the cyber domain. We also love charity events - the Business Run, and cybersecurity training for the Success University. But the most important thing is the support of women who work in the industry and understand the nuts and bolts - not only on a professional level but also on the social level. There is a great need to connect with women who have succeeded in cybersecurity. It is really inspiring for others! Ladies badly need female examples to follow, role models, achievers - then they bravely go for more.

Women in IT and cybersecurity

What is the strength of women in cybersecurity? What do they bring to the industry? What predispositions or competencies of women are particularly useful?

Aneta Legenza: Most women do not like gender distinctions. They believe that knowledge has no gender, what counts are hard, proven competencies. There are female specialists, whether as pentesters, in the SOC, compliance or training departments. But of course, in addition to knowledge (which is double-checked - not only by the industry but also by the „internal critic" in many women), women also bring the ability to connect, to talk to representatives from other departments. This often fosters joint development of best practices that serve the entire company. In addition to this, women like to share knowledge and are heavily involved in social and charitable activities, becoming great ambassadors of cybersecurity. I am delighted that we were able to persuade such a large group of women active in the area of cybersecurity to share their observations in this report, and I am proud to be a co-author of it.

What did your career path in the cyber industry look like?

Aneta Legenza: I started my adventure in cybersecurity already at the university level. Why this faculty? At the time, it was an option to combine my two specialisations: mathematics and computer science, and on the other hand, the direction I took - cryptology - sounded different and thrilling. I spent the next 15 years doing consulting services and taking part in numerous projects. I am an experienced and certified project manager. Most of my professional life has revolved around IT and security, so working at Standard Chartered, first as Director of the Security Transformation Programme and now as Director of Cybersecurity Strategy and Planning, has allowed me to spread my wings and dedicate myself fully to this subject matter.

How would you encourage women to work in cybersecurity?

Aneta Legenza: The hardest part is taking the first step and breaking down the stereotypes that technical majors are for men. Cyber-security is an industry for women and it is more feminine than many people think. I have a lot of female colleagues who thrive in it. The industry gives us the chance to work in a very diverse environment and diverse areas. Female engineers, humanists and psychologists find their place here. It is a place for everyone who is looking for opportunities to grow and the never-ending chance to learn new areas.

> Most women do not like gender distinctions. They believe that knowledge has no gender, what counts are hard, proven competencies.

Cyber Women Community

*We are inspiring and supporting women
in starting and developing careers in cybersecurity.
We are building an active community of women
who want to grow and are not afraid to dream!
We promote and empower women to discover
their ways in new technologies.*

WWW.CYBERWOMEN.EU