Autism and the technical security industry

Synopsis:
The technical security industry has a skills shortage. There is a need to develop the skills of its existing workforce to combat new threats and to encourage new talented people into the industry. The industry values some of the attributes associated with autism and already employs people who are formally or informally on the Autistic Spectrum. However, young autistic people do not necessarily know that the technical security industry exists and are therefore unaware of the job and career opportunities that the industry has to offer. We must make more people aware and provide structural and supported pathways for autistic people.
Introduction
In October 2016, IAAC ran a workshop with the National Autistic Society, members of the security industry, academia and other interested parties to discuss careers, skills and diversity. The National Autistic Society opened the discussion with a description of autism and its symptoms. This provided an opportunity to discuss and describe some of the attributes commonly associated with autistic people and how these reflect the requirements of certain roles within the technical security industry.

The National Autistic Society also explained that as a disability, autism is relevant for disclosure to an employer and is covered by the Equality Act 2010. Thus stated that it is unlawful for an employer to treat an applicant or employee less favourably than another applicant or employee for any reasons connected to their disability. Under the terms of the Act the employer must also consider making reasonable adjustments and in order for an employer to make these adjustments they will need to know about the disability. Despite this, disclosure is not common, and it can also potentially provide benefits to the employer and the employee in terms of access to funding and support. But where should disclosure fit into the employment cycle, and is there still a stigma associated with this disability within the cyber security industry and wider sector that the industry supports?

As described, many of the individual attributes associated with autistic people align with the requirements of the technical security industry. However, not every autistic person is suitable for the cyber security industry, nor does every autistic person want to join the industry. The industry does however need to ensure diversity and provide support to the individuals that are looking for work in this area, as well as encouragement to industry to help them consider employing autistic individuals.

The National Autistic Society provided evidence that once in employment there is a not insignificant percentage who leave that employment in a short space of time. This could be for a number of reasons such as sensory sensitivities, difficulty with social interaction and communication, as well as difficulty understanding the unwritten rules and expectations of the workplace. It is therefore important that any initiative to encourage more autistic people into the industry is also coupled with initiatives during employment. These should provide an understanding of the issues that might make the workplace difficult for the individual and guide employers to provide additional support facilities to make the workplace an easier place to grow.

The cyber security industry must make sure that it is inclusive if it is to meet the demands of both the skill shortage in terms of the number of people and the skills available within the industry. In terms of autism, the industry, and in particular the technical security element of it, is quite diverse but more can and should be done. There are a wide range of other activities required if we are going to be a truly diverse and inclusive industry. It is important that we put initiatives in place to encourage more autistic people into the industry and that these initiatives also form an integral part of the wider diversity programme.

Objectives
During the workshop, two primary activities were identified.

The first, how do we educate employers to recognise the potential benefits of employing autistic people, support them in the employment process and help them into the working environment?

The second activity was, how can we support autistic people who may have an interest in working in the cyber security industry to make sure that they have the relevant opportunities and they understand what is required of them in terms of identifying and moving towards a career in technical cyber security?

It was recognised in the workshop that these two complementary activities were extremely important, but to try to cover all of these in one document/initiative was going to be very difficult. It was agreed that these two activities would be broken down. IAAC would look at how to educate employers and CREST would look at how to support and encourage autistic people into the working environment in the technical cyber security industry.

These reports and the relevant activities need to be both complementary and collaborative in terms of their nature, as well as to fit in with wider initiatives in other areas of diversity.

How do we support autistic people?
The technical security industry has a skills shortage and a lack of people. The industry itself values some of the attributes associated with autism and already
employs people who are formally or informally on the autistic spectrum. In addition, young autistic people do not necessarily know that the technical security industry exists, nor do they understand that some of their attributes are valued and therefore are unaware of the job opportunities and career opportunities the industry has to offer. If we can address the needs of the technical security industry and we can address the needs of these young people, then both parties win.

Six primary activities were identified during the workshop to support the autistic individual into the working environment, particularly in terms of cyber related security careers and jobs.

The first activity identified is to make autistic individuals aware of the opportunities available within the cyber security industry. If we are going to encourage people to join the industry we must first ensure that they know we exist. We need to provide them with knowledge of the opportunities, the types of job roles that are available and how they might apply for these roles.

The second is to ensure that they recognised there was a positive view of some of the attributes that they demonstrate. We need to do this in a way which is both supporting and is also realistic in terms of the opportunities available to them and the types of jobs that are available.

The third is to increase the feeling of being valued. Everyone wants to feel valued but if you have had problems for much of your life, then that feeling is an even more important element of employment and essential to helping career growth. If we are going to support individuals into the industry, we must make them feel valued and provide support mechanisms within the organisations to help them both into work and to help them in terms of how they operate and how they progress and grow.

The fourth is supporting the application process. Some autistic people take a very structured and literal approach in terms of the way they provide answers to questions. The application processes for many organisations rarely support this and have confusing questions. Some autistic people may struggle to even complete the application.

Job titles and descriptions are often confusing. They talk about needing attributes such as ‘strong communication skills’, which may put some people off applying. Autistic people can be great communicators but when so much emphasis is put on this, it could appear daunting.

The fifth is supporting the interview process. Some autistic people experience difficulties in a one to one situation where there is a requirement to be communicative. What we need to do is to both educate the employer to be more sympathetic to the needs of autistic people, supporting applicants and ensuring they are less stressed and are more comfortable in the interview process. They need to know how they can portray their attributes in a positive way and increase their likelihood of employment.

Once in employment, it doesn’t stop there. Those who work with autistic people have to recognise that it is a disability and there may be certain things or certain attributes that the individual has that don’t fit into societal norms. They need to understand what autism is and be made aware or be aware of how they can help. This is essential because if we try to get people into the industry and then we don’t support them, we are ultimately going to fail. Their employment rates will drop because they will either leave because they feel uncomfortable or they’ll be removed from the work place because those working with them do not know how to interact with them.
3.1. **Being Valued and Recognising Positive Attributes**

The first thing to be considered in encouraging people to pursue a career in cyber security is to instil the feeling of being valued by the industry. This is extremely important and must start very early in academic studies. There are already school level career guides available from organisations such as CREST. However, these have not been validated against the requirements of young people with autism, nor have they been refined to be more appropriate to the audiences we would look to communicate with.

In addition to career guides, the cyber security industry could easily provide more specific information packs on why the industry is interested in the positive attributes associated with autism. In addition to written documents, the industry could produce a short film on these positive attributes and how they can be applied to certain job roles within the industry. It would also help to show why individuals demonstrating these attributes are extremely valuable to organisations and to the industry as a whole.

The cyber security industry needs to define positive industry supported enforcement messages, and these messages need to be communicated to schools, colleges, universities and other areas where individuals with autism reside. These messages will help to ensure that we get a consistent, supportable and understandable set of messages about the industry as wide as possible. These messages can be built into the career guides and support material.

Once created this material can be trialled and refined. There are already avenues for this type of validation for example, in areas such as Inscape in Manchester. The approach should be to develop activities and supporting material and trial them on a small basis before trying to roll them out throughout the country.

There is already career information available from organisations like CREST and via websites such as Inspired Careers. The ‘Day in the Life’ films on [www.inspiredcareers.org](http://www.inspiredcareers.org) may have suitable role models that will help individuals to understand how they can get into industry and what type of jobs are available and how exciting those job opportunities are.

In addition to ‘career day in the life films,’ initiatives such as Cyber Security Challenge would be attractive to people on the autistic spectrum. We can ensure that young autistic people are made aware of the Cyber Security Challenge and some of the challenges that may be specifically applicable to them. We can develop individual challenges to try to raise their level of confidence before we introduce them into national competitions against a much wider audience. If we do these three primary elements, in other words provide information on positive attributes, provide films on how those positive attributes are viewed within the industry and then support positive enforcement messages, we believe that the feeling of being valued will increase significantly.
To ensure a positive view of the traits and attributes of autistic people, other things can be done. The industry could certainly consider the refinement of some of the ‘day in the life’ videos previously mentioned to identify individuals specifically with autism and to draw out their experiences in a more structured manner. The positive message that we want them to have and also the positive message they should be taking to potential employers is: ‘I am autistic and this is what I bring to your organisation’. Encouraging a more positive view of autistic attributes and the benefit to organisations, will help the individual to feel more valued and increase their employment prospects.

3.2. Awareness of Opportunities

Knowledge of the opportunities is key to encouraging more people to consider a career in cyber security. Again, specific films related to autism as well as ‘day in the life’ films would help provide some of that information. But the industry could also gather the collective views from internal and external recruiters in terms of the attributes that they are looking for from individuals. If we can identify some correlation between those attributes and the employment requirements, then again we can provide much greater opportunities for individuals to know what types of roles to apply for.

Just because somebody is interested in working in the cyber security industry does not necessarily make them suitable, nor do some of the jobs actually fit very well within the attributes associated with somebody with autism. For example, there is a major requirement to identify ways of improving the awareness of cyber security through effective marketing to individuals. This requires the ability to communicate security awareness messages and to influence individuals in the way they operate within the organisation. Equally, there are roles we would not associate with being compatible to autistic traits, yet they may do the job really well. However, malware reverse engineering, penetration testing, intrusion analysis are certainly roles where a number of autistic traits would be really beneficial in terms of the individual.

3.3. Supporting the Application Process

The application process to move towards an interview can be a minefield for anyone, and particularly so for autistic people. Answering questions literally, not answering questions that are required or not understanding context can make the written application poor in comparison to others. The industry needs to help autistic candidates work through the application process and present themselves in the best light. The industry, for example, could work with existing autism bodies to provide a checklist of important considerations for completing applications and provide specific guidance. This would be designed to help somebody with autistic traits to complete what other individuals would find easy in terms of open-ended questions and to understand better what a potential employer may be looking for.

The industry could produce guidelines for applicants suggesting that they look at employer websites for details of their diversity policy and how to use them to their advantage in the application process.

The guidance could highlight the positives associated with their condition and make sure that there are standard application statements that can be put in that describe how these attributes can be of benefit. The interviewer will then be able to make reasonable adjustments by rephrasing questions. The guidance could suggest to individuals that they provide internet links or web links to information on autism to again try to highlight to the employer exactly what the disability is, what the issues may be in terms of employment and therefore what support mechanisms need to be in place, but at the same time reduce some of the fears of the employer in terms of the individual’s ability to work.

The industry could provide a showcase for autistic cyber-related activities encouraging autistic individuals to write documents, to do activities and forming an important part of their application process. Rather than having to describe the details of what they have done during a formal interview process, they showcase something they have
previously completed and therefore demonstrate competence and capability. In addition, some autistic people speak very fluently about subjects that they are passionate about. If they have done research in this area and they produce something which they believe is good, the enthusiasm for this work will come through and therefore the potential in terms of the individual’s enthusiasm for doing this type of work would also shine through.

The industry could provide a support line to help people through the application process. The support line could also be used to help them prepare for interviews and help them into the working environment. It could also be made available to those experiencing problems in the working environment. We could also encourage cyber security recruiters to ask more closed questions. Some may even consider providing questions in advance to all candidates.

We could certainly work with the National Autistic Society and other agencies to try to provide this support line for people and try to provide the help that they need to understand how they can operate within the organisation in an effective way and how they can get on with work colleagues.

The cyber security and recruitment industry could provide example CVs from autistic people or just samples of answered questions. In other words, taking open questions that some autistic individuals struggle with and demonstrating how they can be answered in a positive way. We could also look for roles within our organisations and within the industry that would have a match in terms of requiring similar attributes to autistic people, and again in that way we can identify the roles and the job opportunities that would be most suitable.

3.3.1. Work Placements

Work placements are very difficult to find, especially for, but not limited to, autistic people. To help address this CREST is looking at activities like virtual work placements to overcome some of the geographic restrictions and some of the financial problems individuals have with identifying work placement opportunities. These virtual work
placements could provide the opportunity for individuals to comment on or contribute to research activities which they then get recognised for in terms of their contribution to a final publication. This remote but focussed working may be very suitable for autistic individuals.

Virtual work placements could also be a good way of providing opportunities for autistic people to demonstrate that they can work as a team, even if that team is remote, and provide a positive contribution. The team element is really important. Some of the work within the cyber security industry requires teamwork but does not necessarily require individuals to sit next to each other and debate and provide a collaborative view. What they need is individuals working and then coming together to share their ideas and to share what their concepts are in a constructive way, and certainly some of these virtual work placement opportunities could provide that opportunity.

3.4. Supporting the Interview Process

In supporting autistic individuals, providing support prior to the interview process is of vital importance. Considering the need for skills within the industry and having identified the type of individuals that tend to have the attributes that would be suitable, industry must try to get past and find alternatives to the more traditional interview process. For many autistic people it is a daunting and frightening experience. The industry could also provide interview techniques and documents to help autistic individuals.

We could suggest that candidates are given the opportunity to provide a list of reasonable adjustments such as:
- Dim lighting
- Quiet room
- Reduced eye contact

Once that list has been created, the individual can look for various things to try to make them feel more comfortable. They could, for example, ask for the questions they will be asked in advance so they’re not wrong-footed in the interview. They could look at other things that would reduce the stress. For example, going to the site where they are going to go for the interview prior to the interview. The industry could also provide opportunities in workshops to support what would be said in terms of an interview, so in other words mock interviews with real employees in a workshop environment. Again, this may even provide the opportunity for autistic individuals to be exposed to the industry and therefore may reduce the need for individuals to have a more formal interview. If an organisation has spent the time to identify that they would be willing to work in these workshops, they will have probably spent the time to understand the requirements and needs of autistic people. Therefore, they will have better insight into the support an autistic employee may need and therefore be more likely to employ.

The industry can look to provide mentoring services with specific interview techniques orientated towards autistic people. Those mentoring techniques would be extremely beneficial to the individual, both in terms of the support services to get individuals into work, but may also form a platform of how they are going to operate in a normal working environment in the future.
The industry could work with autistic individuals in conjunction with the National Autistic Society to provide examples of interview-coping strategies. The coping strategies could range from how to get to the site, how to prepare and develop coping strategies, to helping people understand their disabilities and turning those to their advantage.

As part of the interview process the industry could also suggest that the individuals take in copies and details of their condition. We have suggested that candidates provide links on their applications and it is also important that interviewers are passed the relevant information regarding candidate disclosure in accordance to the Equality Act 2010. It could potentially cause someone a lot of distress having to disclose face to face at the beginning of an interview and could be detrimental to their performance. It may have taken a lot for them to disclose on application and so this must be treated as important. Just as someone disclosing they may need physical adjustments during interview would need and expect this, so should an autistic person.

The industry could try to generate guidance films specifically for autistic people to describe what recruiters are looking for. Again, anything we can do to make it feel less threatening and less intimidating as the individual goes into the recruitment process, the better. If they know what to expect, they are going to feel much more comfortable. If they know what is expected of them during the process, then again the likelihood of a positive outcome will be increased significantly.

The industry could arrange workshops to both promote the industry and to help coach the individuals. If we expose individuals through workshops to organisations that want to employ people in the cyber security industry, then it may be the case that during these workshops individuals are identified and are offered jobs without the need to go through to formal interviews which for some autistic people is quite a daunting proposition.

3.5. Support in Working Environment

The final activity is support whilst in working environments. This is an extremely important consideration because once in employment, the National Autistic Society said the number of people that do not stay very long within the company that has employed them is quite significant. They stated that a lot of this can be traced back to problems the individual has whilst working in traditional environments. Usually because of a lack of understanding and no reasonable adjustments.

The induction process is a first very important step. There are a number of things that can be done in this area. Where disclosure has been made, the employer should be able to identify potential difficulties and make anticipatory adjustments to the environment, training for staff and communication. The person responsible for inducting the individual into the organisation will need to account for their specific needs and take steps to try to ensure that the elements that could potentially stress the individual can be first of all considered and then secondly turned into positive statements and actions. These can be then described to some of the work colleagues for an understanding of the issues associated with the autistic individual.

Disclosure needs to have been agreed in advance and at induction it is essential that the person responsible is made aware and understands the symptoms, the areas that could stress the individual and can help to support them in the working environment.

It is essential to provide details on how the mentor will help, along with who is responsible for inducting the new employee in to the organisation and how this will be done and a positive working environment ensured. This is very much like a personal development programme but orientated towards making sure the individual feels comfortable within the working environment.
The next thing that could be done is one-to-one mentoring support. Mentoring is a very important part in terms of the general support of the working environment, but for somebody with autistic characteristics, it is essential. It is important that the mentor understands that autistic people generally do not stay at a fixed point on the spectrum. Their difficulties will vary and fluctuate depending on different situations. The one-to-one mentoring would be not only help in terms of how to do the job but also how to actually operate within the environment and work with colleagues.

The next element is support to the individual provided through professional IT institutions and autism charities and other specialist support services. There are undoubtedly things that the professional institutions can do to assist individuals into a career in cyber security by providing demonstrable career pathways and career guidance aimed at minority groups with different needs. In addition, support services can be developed for those already in work to help them in the working environment, allowing them to cope better with difficult situations and for management and colleagues to understand the issues associated with autism.

4. **Summary and Call For Action**

A number of potential activities have been described in this report but we have not discussed the potential target audience; apart from the individual. Obviously we need to concentrate on autistic people themselves, but if the industry is trying to make sure that there is an opportunity for people to consider a career in this important industry, then the parents, carers, and educators of autistic individuals need to also be made aware of both the opportunities and the issues associated with working in the industry. If we do not have the support of parents, carers and educators then the individual will not have all of the opportunities available to them to join this exciting industry.

It is also important to consider those individuals who are responsible for careers advice and those responsible for looking after autistic people. In the school areas, school governors can make a significant difference. It is the responsibility of the governors to ensure a good development and support environment for all, and also for everybody to understand the opportunities that are available to them. In terms of the academics, again identification of the positive attributes associated with autistic people is a very important consideration. The individual must be made to feel like they are wanted, make sure that they understand that their skills are valued and make sure there is a good opportunity for them and fantastic career opportunities.

In addition to schools, college and universities, the specialist institutions that support autistic individuals should also be made aware of career opportunities. Anything that the industry produces as part of this initiative must take into account at least these five different target groups and make sure that any documentation or support material that’s available is targeted at these groups.

If we develop the supporting activities for individuals trying to enter the industry, it’s not unfeasible for them to be used and utilised by people already working. Therefore, all of the material produced can apply to a more mature autistic person who may be having issues working in the traditional working situation. In the production of material, it is extremely important that we’re careful not to disrespect the individuals. They are valued, and therefore they must be recognised in terms of the contribution they can make and the fantastic opportunities that are available to them working in this exciting industry.
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<td><strong>Coordinate and Promote</strong></td>
<td>1. Establish an industry/autism support group/panel to oversee and coordinate activities and set performance metrics</td>
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<td>2. Publicise IAAC &amp; CREST Reports and create a register of suitable material from all sources</td>
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<td><strong>Knowledge Of Opportunities</strong></td>
<td>3. Work with autism specialist and cyber security recruiters and autism support groups to create a specialist autism positive attribute list</td>
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<td><strong>Knowledge Of Opportunities</strong></td>
<td>4. Create autism in cyber security specific career guide</td>
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<td><strong>Being Valued and Recognising Positive Attributes</strong></td>
<td>5. Produce a short film that focuses positive attributes and career opportunities</td>
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<td><strong>Being Valued and Recognising Positive Attributes</strong></td>
<td>6. Review <a href="http://www.inspiredcareers.org">www.inspiredcareers.org</a> to signpost suitable Day In The Life films. Liaise with the cyber security industry for creation of new Day In The Life films to reinforce career options and suitability of the industry.</td>
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<td><strong>Knowledge Of Opportunities</strong></td>
<td>7. Create specific links on neuro-diversity from main menu on <a href="http://www.inspiredcareers.org">www.inspiredcareers.org</a></td>
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<td><strong>Support In The Application Process</strong></td>
<td>8. Liaise with cyber security industry on the development of suitable ‘virtual workplacements’</td>
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<td><strong>Support In Interview Process</strong></td>
<td>9. Review CSC, NCSC, NSA and CREST activities for challenges suitable for target groups of individuals and reference in supporting material</td>
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<td><strong>Support In Interview Process</strong></td>
<td>10. Create specialist subject area white papers and films from research and workplace material and post on the CREST Advocate YouTube channel and/or other suitable channels</td>
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<td><strong>Support In Interview Process</strong></td>
<td>11. Trial career inspiration and workplace material at Inscape</td>
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<td>12. Create or link to guides that support the application and interview processes</td>
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<td><strong>Support In The Application Process</strong></td>
<td>13. Establish mentoring and interview workshops (potentially provide extension to intervention workshops organised by the NCA)</td>
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The Information Assurance Advisory Council (IAAC) is a unique ‘not for profit’ body that brings together a community of some 600 professionals. This includes corporate leaders, government officials, members of the defence, security and law enforcement communities, academics, scientists and technical experts, in order to address the information assurance and related challenges faced by the ‘Information Society’. IAAC was founded in 1999. Since then it has been at the leading edge of many of the developments in Information Assurance and Cyber Security thinking in UK, maintaining a non-partisan position on matters affecting the way society uses and protects information.

https://www.iaac.org.uk

Cyber Security Challenge UK is a series of national competitions, learning programmes, and networking initiatives designed to identify, inspire, and enable more people to become cyber security professionals. Established to bolster the national pool of cyber skills, it offers a unique programme of activities to introduce sufficient numbers of appropriately skilled individuals to learning and career opportunities in the profession.

Our Sponsors demonstrate exceptional commitment to the Challenge initiative, providing considerable financial and other support to help the Challenge achieve its aims and objectives. They are a driving force working to help safeguard UK cyberspace and are a cornerstone within the trusted Challenge community. https://cybersecuritychallenge.org.uk/about

For further information contact CREST at http://www.crest-approved.org

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