NW CYBERCOM

STRATEGY RESEARCH REPORT
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EXECUTIVE SUMMARY

There is a growing culture of commercialisation and entrepreneurship within academia with some notable success stories and initiatives – but there remain barriers around funding, dedicated time to commit to spinout generation and ensuring product market fit.

THE NW CYBERCOM PROGRAMME HAS BEEN A SUCCESSFUL INTERVENTION:

By providing pre-seed funding (up to £25K per project) to 14 projects, and with sector specific guidance and mentorship from successfully exited founders (the Innovators in Residence), the cohorts have realised further opportunities. Participants have been selected for ICURe and CyberASAP for future funded acceleration opportunities, and four projects are on a spinout trajectory, with at least one project exploring investment potential.

STRATEGIC INTENT IS CLEAR, BUT FRAGILE FUNDING MECHANISMS HINDER ACADEMIC ENTREPRENEURSHIP:

In the UK, particularly in the North West (NW), there is a growing strategic commitment to commercialisation and economic growth of cyber, science and technology solutions from academia. Funding for initiatives catering to academics pursuing entrepreneurship is already limited yet is being reduced further. Without the stability of funding year on year, there will be less support for the most innovative, highly commercial projects to explore spinout opportunities.

ACADEMICS ARE HIGHLY MOTIVATED BY MAKING REAL WORLD IMPACT BUT STRUGGLE TO PURSUE COMMERCIALISATION DUE TO TIME CONSTRAINTS:

There is often a genuine, deep-seated belief in academics pursuing commercialisation, that their idea will have a meaningful societal and wider impact. This was found to be a key motivator for commercialisation. However, developing minimum viable products, proof of concepts, spinning out and attending the most valuable acceleration programmes all require a significant investment of time – which academics struggle to find around existing commitments.

Further funded interventions (see recommendations) are required to capitalise on the momentum that has built in the NW and across the UK.

RECOMMENDATIONS FOR FUTURE FUNDING

01 |

STEM2CTO: a programe to upskill academics in how to be a successful CTO.

02 |

NorthWest NetWork: a North West based entrepreneurial network for mentorship.

03 |

Tech Transfer Bridge: a physical and virtual hub that champions exploring new ideas and supports academics through curated events.

04 |

Product-Market Fit Playbook: a one stop shop guide for budding entrepreneurs to articulate their idea's product market fit.

05 |

Innovators in Residence (IIR) and the C-Suite: expand the IIR model and establish a sector specific cadre of experinced fractional CEOs/CFOs.

06 |

Graduate Training Scheme: support recent graduates with apprenticeships into spinouts / startups to give them hands on entrepreneurial experience.

07 |

Entrepreneurship Pathway: create a recognised pathway that celebrates the achievements of entrepreneurial academics.

08 |

Upskilling Tech Transfer Officers (TTOs): a modular programme of experiential learning, it would be beneficial to upskill TTOs with industry demand for novel technologies.

09 |

Ambassador Programme: inspiring the next generation of entrepreneurs through the success of others.

THE NW AND UK'S COMMERCIALISATION LANDSCAPE

"The gap is around market validation - they need to know the market and environment and competitor analysis."

- Interview

UK'S ACADEMIC COMMERCIALISATION LANDSCAPE

There is a growing culture of commercialisation and entrepreneurship within academia with some notable success stories and initiatives – but there remain barriers around funding, dedicated time to commit to spinout generation and ensuring product market fit.

GROWING INTERNATIONAL SUPPORT

Global momentum is growing around spinouts and secure technology innovation, but only a few ecosystems have achieved maturity.

The UK Science & Technology Framework identifies commercialisation of research as a core pillar to achieve science superpower status, emphasising spinouts, IP, and industry engagement.[1] To support this, the government pledges to support the creation of a scaleup finance ecosystem capable of nurturing science and tech spinouts.[2]

The next Research Excellence Framework (REF) for the UK will be completed in 2029 and will involve research assessment of Higher Education Providers. This will facilitate research excellence and impact, including through spinouts and industry engagement, driving university incentives toward commercial activity.[3]

FUNDING

There has been an uptick in investment in research translation and spinout support, particularly for cyber, quantum, life sciences and AI. The UK government and private capital are increasing support for early-stage research and development (R&D) and commercialisation pipelines. In the UK, university spinout investment grew five-fold from £1.06 billion in 2014 to £5.3 billion in 2021.[4]

On 26 March 2025, Sir Chris Bryant announced £60 million of R&D funding over the next year for advanced connectivity technologies, with the sector's potential also highlighted as a growth market in the Industrial Strategy.[5]
The UK's Higher Education Innovation Fund (HEIF) continues to distribute over £200 million annually to English universities to support knowledge exchange and commercialisation infrastructure.

At a strategic level, there is momentum to increase public funding, but in practice, funding support for initiatives is uncertain. Initiatives are being scaled down, such as ICURe, and government spending reviews have delayed new programmes from commencing. Funding stability is critical for academics to pursue commercialisation and entrepreneurship.

EASING OF REGULATORY & LEGISLATIVE REQUIREMENTS

Globally, governments are reviewing and modernising spinout governance, Intellectual Property (IP) terms, and academic-industry engagement processes to reduce friction and accelerate commercial activity.

To incentivise the commercialisation of research, an independent academic spinout review contracted by the Department of Science, Innovation, and Technology (DSIT), recommended harmonised, founder-friendly term sheets and reduced university equity stakes, from ~25% to best practice at 5–15%.[6]

Average deal time is being scrutinised: currently 10–12 months in the UK, but pilots are exploring 'fast-track' approval routes.

CyberASAP and Innovate UK programmes are creating clearer, repeatable regulatory pathways for cyber focused spinouts, reducing entry barriers for first time academic founders.

NW CYBERCOM & THE NW ECOSYSTEM

The NW CyberCom programme has strengthened the regional ecosystem through increased university engagement, the growth of cyber firms, and enhanced infrastructure and skills development across the NW. A summary of highlights are included below.

BUSINESS AND INVESTMENT INDICATORS

- Cyber company growth: Up from 300 (2022/23) to 350 (2023/2024).
- 55% of all UK cyber ecosystem investment in the first half of 2024 was in the NW.
- Between July 2023 and June 2024, the NW was the region with the largest Venture Capital (VC) investment in UK cyber security: Notable deals:
  - PortSwigger (Cheshire) raised £88 million.
  - CultureAI (Manchester) raised £8 million.
  - Mindgard (Lancaster spinout) secured a £3 million seed investment in 2023 and won the UK's Most Innovative Cyber Small to Medium-sized Enterprise (SME) 2024 at Infosecurity Europe 2024.

INFRASTRUCTURE DEVELOPMENT

- High quality and domain-specific cyber security and digital co-working and incubation hubs have been expanded: Digital Innovation Security Hub (DiSH), Lancaster Environment for New Security (LENS), InfoLab21, Fraser House, Bruntwood sites.
- Lancaster launched a new Data Emerging Suite and Digital Training Labs supported by a £4 million Office for Students (OfS) grant.
- Significant university investment:
  - £19 million from Lancaster for cyber security and protection science.
  - £4.7 million from Manchester into AI and trust.
  - UCLan expanding cyber apprenticeships

STAKEHOLDER REFLECTIONS (REAP EVENT)

- There is a strong appetite for collaboration, but barriers remain:
  - Investment knowledge gaps (especially among generalist VCs).
  - Need for dedicated cyber funds.
  - Persistent IP friction and unclear spinout pathways.
- There is a clear call for:
  - More cohesive brokerage between research, founders, and funders.
  - Testbed capabilities to keep spinouts regionally rooted.
  - Better visibility and brand-building around the NW cyber proposition.

SKILLS AND TALENT PIPELINE

- CyberFirst Gold Hubs launched in all NW local authority areas (24 total).
- Cyber MBA programme at Lancaster (certified by the National Cyber Security Centre (NCSC)).
- BAE Systems backing 40 cyber professionals through Capslock Certified Cyber Security Practitioner course with fully funded positions.
- Regional SME development facilitated through programmes such as Cyber Runway and NCSC for Startups as well as cross-sector skills partnerships with IN4 Group.

NW CYBERCOM PROGRAMME

NW CyberCom aims to accelerate the commercialisation of academic cyber research in the NW by connecting universities, industry, investors, and government through coordinated regional collaboration. As a result, the programme has funded projects with spinout potential, with 4 projects on a spinout trajectory.

SUMMARY OF THE PROGRAMME

- NW CyberCom is a £1.2 million initiative (funded by Research England) to accelerate the commercialisation of cyber research in the NW.
- Launched in 2023, it involves six universities (Lancaster, Manchester, Manchester Metropolitan, Liverpool, Salford and Central Lancashire) and partners including Plexal, CRSI and MIT.
- It aims to transform academic cyber research into spinouts, products, and services, aligned with national infrastructure, defence, and innovation needs.

CORE FOCUS AREAS:

- Unlocking multi-stakeholder partnerships across government, academia, corporates and capital, and providing access to end users in industry to inform product market fit.
- Facilitating testbeds / sandpits and commercial pathways for cyber technologies.
- Promoting an entrepreneurial culture within cyber academia.
- Access to seasoned entrepreneurs through the IIRs – successfully exited, sector specific founders to provide mentorship and guidance.

SUPPORTING ECOSYSTEM ACTIVITIES:

- 800+ academics were made aware of the project and opportunities for commercialisation
- Hosted major events (e.g. Developing the NW Cyber Ecosystem event, with 60+ stakeholders).
- Promoted cross-institutional collaboration, shared investment and IP discussions.
- Embedded cyber innovation priorities into place-based strategies and the National Cyber Force (NCF) narrative (based in Samlesbury from 2025).
- Early exposure to investors at events to shape a funding roadmap.

The NW CyberCom programme has resulted in real world impact including: **70 academic teams attended a commercialisation sandpit, 32 proof of concept applications were submitted, 14 projects have been funded, 3 projects going on to ICURe, with 1 project accepted onto CyberASAP and 4 projects on trajectory for spinout.**

SUPPORT DEMAND FOR ACADEMIC CYBER SPINOUTS

CyberASAP demonstrates a high calibre pipeline of cyber security innovations emerging from UK universities, with research-led spinouts showing strong technical potential. Yet software and hardware pathways each face distinct commercialisation challenges with hardware solutions requiring significant funding for proof of concept, and software needing deep IP understanding, while both pathways also demand business skills and industry engagement to succeed.

ACADEMIC SPINOUT PIPELINE THROUGH CYBERASAP [1]

GridGuardian

Company Overview: GridGuardian secures solar energy systems and EV chargers via embedded firmware-based cybersecurity to protect critical infrastructure
University: University of Sheffield
Stage of Development: Proof of concept complete; in field testing
Requirements: Support to scale testing, validate performance across devices, and secure regulatory and market access partnerships

CyberMATI

Company Overview: CyberMATI uses AI to detect phishing and spoofed websites by mimicking expert human threat assessment and adapting to new attack patterns
University: Sheffield Hallam University
Stage of Development: Proof of concept complete; international patent application filed
Requirements: Investment for ecosystem integration and support with go to market strategy, sales pipeline development, and scaling operations

FORENSIC

Company Overview: FORENSIC combines hardware and software to detect anomalies in cyber-physical systems using low-level hardware signals
University: University of Essex
Stage of Development: Proof of concept complete; preparing for spin out
Requirements: Investment for pilot trials in in smart manufacturing and support to progress toward a minimum viable product (MVP)

KEY DEMAND REQUIREMENTS FOR UK CYBER SPINOUTS

- **Early Stage Bottlenecks:** Pre-spinout cyber ventures from UK universities show strong technical promise but are frequently stalled by costly proof of concept demands, especially in hardware led innovations like GridGuardian and FORENSIC.
- **Commercial Capability Gaps:** Academic teams often lack commercial skills, investor engagement strategies, and clear go to market pathways — slowing their transition to viable ventures.
- **Post-Accelerator Drop Off:** While CyberASAP helps validate early ideas, longer term support is missing to move projects from prototype to scalable deployment.
- **High Risk Domains:** The path to commercialisation is especially fragile for cyber security solutions that have applications in critical infrastructure, smart manufacturing and cyber physical platforms where safety and compliance stakes are high.

WHAT DOES THIS MEAN FOR NW CYBERCOM?

- **Investor Access Strategy:** Connect promising pre-spinout academic ventures with regional testbeds and early-stage investors to proactively strengthen the NW innovation pipeline and accelerate progress towards proof of concept.
- **Commercialisation Support:** Leverage cross-disciplinary university expertise — including IP and patenting teams and business schools — to support technical teams with go to market and sales early on.

ACADEMIC CYBER SPINOUT MARKET

Academic spinouts represent an important pipeline for cyber security innovation in the UK, but university equity structures can hinder investor engagement with spinouts.

THE UK'S TOP FIVE CYBER SECURITY ACADEMIC SPINOUTS AND UNIVERSITY EQUITY

DARKTRACE	Raising £173m
Region: London University of Cambridge	Equity (%): 0
Darktrace utilises AI to monitor and protect organisations' digital assets through a cyber security software platform.	
PQSHIELD	Raising £50.3m
Region: South East University of Oxford	Equity (%): 30
PQShield develops cyber security technology using post-quantum algorithms.	
FREEVOLT TECHNOLOGIES	Raising £37.9m
Region: South East University of Oxford	Equity (%): 5
Freevolt Technologies develops smart cards and other biometric technology for access control and fraud prevention, utilising existing radio frequency energy.	
OPTALYSYS	Raising £31.2m
Region: Yorkshire and The Humber University of Cambridge	Equity (%): 0
Optalysys develops optical processors with applications in big data, supercomputing and data security, making use of lasers and gel-filled cells to encode and analyse large amounts of data.	
CYACOMB	Raising £15.1m
Region: East of Scotland Edinburgh Napier University	Equity (%): 30
Darktrace utilises AI to monitor and protect organisations' digital assets through a cyber security software platform.	

Figure 1. Plexal analysis using Beauhurst data (more information in Appendix B).*

KEY MARKET OPPORTUNITIES FOR UK CYBER SPINOUTS

- Only 32 of the UK's 770 active digital security companies are academic spinouts, signalling a commercialisation opportunity for universities with strong cyber security research departments.
- Top spinouts shows wide variation in university equity (0-30%) as shown in Figure 1. Darktrace and Optalysys, had 0% university equity, suggesting that lower stakes can attract higher investment.
- Yet PQShield and Cyacomb, each had 30% equity stakes and still raised significant funding, showing that higher university stakes are viable where lab and/or IP intensity is high.
- Beauhurst and the Royal Academy of Engineering found spinouts with under 15% university equity correlated with greater investment success, highlighting an opportunity for NW CyberCom to strengthen its regional commercialisation pipeline through equity reform.[1]

WHAT DOES THIS MEAN FOR NW CYBERCOM?

The NW universities should implement a flexible regional model for equity stakes that is aligned with USIT Guide [2] principles, providing:

- **Tailored Equity by Technology Type:** For example, differentiating between software (lower) and hardware (higher) ventures.
- **Transparent and Clear Policies:** Communicate clearly on equity, royalty rates, and exit clauses to speed up the process and build trust.
- **Flexible Licensing and Delayed Valuations:** Use tools like SAFE agreements and convertible notes to support early stage IP heavy spinouts via local innovation hubs.

CASE STUDIES: LEARNING FROM OTHERS

"What happens in Israel – there's an entirely different way of doing things. A massive investor ecosystem is self-fulfilling: investors are choosing the best products, and have the best products to pick from"

- Interview

INTERNATIONAL CULTURE OF R&D: RESEARCH

Academic research powers progress in specialised fields such as cyber security. R&D funding is a critical lever for supporting both the quality and quantity of research outputs. Government investment is key because it encourages further investment from other sources, amplifying the effect.

THE RELATIONSHIP BETWEEN INVESTMENT IN R&D AND RESEARCH

There is a positive relationship between R&D funding and research output from higher education institutions.[1] Not only does public investment allow universities to improve the labs, technologies, and human resources that reduce barriers to the high-impact research being undertaken, but it also ensures the cutting-edge innovations are not just market driven and are therefore more likely to drive long-term societal benefits, serving the public good.[2, 3]

This graph shows the number of cyber research publications for the US, UK, Israel and Singapore between 2019 and 2024. Singapore showed the highest growth in research with a CAGR of 15.1%, followed by the UK at 7.2%. Although the US leads in volume of research output, its annual growth rate of 4.1% is relatively low compared to nations such as Singapore and UK, where there has been a recent push to invest in emerging technology hubs.

CYBER RESEARCH PUBLICATION DATA*

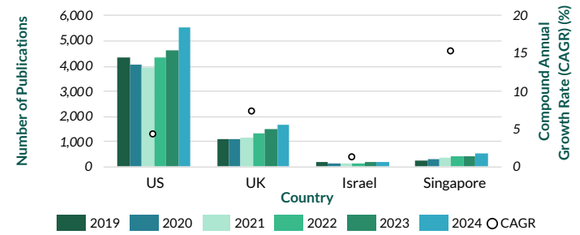


Figure 2. Plexal analysis using Scopus data (more information in Appendix A).

CASE STUDY: SINGAPORE DRIVING CYBER RESEARCH THROUGH R&D FUNDING

- Singapore has seen notable recent success in cyber R&D, particularly in academic research. This has been driven by a centralised governance approach, under the Cyber Security Agency (CSA), and the military-focused Digital and Intelligence Service (DIS), both aligned with a proactive national cyber security posture.[4]
- Government investment in R&D has been strategic and substantial — S$190 million was allocated to the National Cybersecurity R&D Programme (2013-2020), followed by S$1 billion for cyber and AI R&D between 2021 and 2025.[5]
- Example RIE2025 Plan: Singapore allocated S$25 billion to research, integrating cyber security into its Smart Nation and Digital Economy objectives.[6] This has led to Singapore's higher publication output and global citation impact for cyber related research.

THE OPPORTUNITY FOR CYBER RESEARCH IN THE UK

- Over the past five years, the UK has made notable progress in academic cyber security research through targeted R&D funding. This has fostered a robust ecosystem that bridges academic excellence with practical applications, enhancing national security and economic resilience.
- Example of the Academic Centres of Excellence in Cyber Security Research (ACEs-CSR): Backed by the NCSC and UK Research and Innovation (UKRI) the ACEs-CSR scheme designates 19 UK universities that are eligible for a grant of £20k annually for research and postgraduate engagement in high impact cyber security topics.[7]
- To grow further, the UK should increase funding for cyber-related R&D and articulate a strong mission that taps into societal motivations to contribute to national progress and security.

INTERNATIONAL CULTURE OF R&D: DEVELOPMENT

Commercialising cyber security innovation is key in turning research into deployable solutions that can strengthen national resilience. This can be incentivised through increasing R&D funding, improving IP literacy, enhancing tech transfer support within universities, and fostering stronger public private partnerships.

THE RELATIONSHIP BETWEEN INVESTMENT IN R&D AND PATENTS

R&D investment directly correlates with universities' ability to file patents, particularly in cyber security. In the US, patents backed by federal funding tend to be more novel and impactful, contributing to social prosperity.[1] Notably a 1% increase in US federal R&D spending leads to a 0.468% rise in private sector research investment, creating a multiplier effect, which emphasises the catalytic influence of public sector funding for critical technologies like cyber. [2]

This graph shows the number of cyber-related patent applications submitted in the US, the UK, Israel and Singapore between 2019 and 2024. Between 2019 and 2024, Israel and Singapore saw strong growth in patent applications, with CAGRs of 27.7% and 9.5% respectively, signalling rapid innovation commercialisation. In contrast, the US and UK experienced slight declines, suggesting stagnation in IP output despite higher research volume. It is worth noting that the US has c. 4,000 universities, compared to the UK's c. 160.

CYBER-RELATED PATENT DATA*

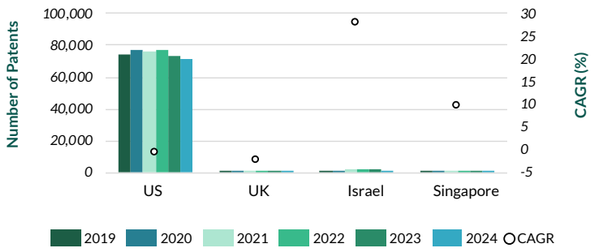


Figure 3. Plexal analysis using Espace data (more information in Appendix A).

CASE STUDY: THE US'S CULTURE OF COMMERCIALISATION THROUGH FUNDING R&D

- While the US leads the number of cyber-related patents compared to the UK, Israel and Singapore (see graph), it no longer dominates the commercialisation of foundational research.[3] China has led global R&D growth since 2003 and now leads in patent filings.[4]
- Post-WWII, US public funding made up approximately 70% of total R&D investment, catalysing a thriving innovation culture through the establishment of mission driven agencies including the National Institutes of Health (NIH) and Defense Advanced Research Projects Agency (DARPA). By 2020, private sector funding accounted for 73% of US R&D, making commercialisation more vulnerable to market driven motivators and volatility — especially for dual use technologies.[5]
- Example of DARPA: Mission-driven R&D of dual-use technologies combining structured funding, market creation, and ecosystem development to accelerate commercialisation. Cyber security investments aim to meet defence needs and attract private sector innovation for infrastructure protection and threat intelligence.[6] DARPA also incentivises small businesses to translate research into products when public procurement is absent. For example, Dartmouth's RL framework could licence algorithms to cyber security firms for real time threat mitigation.[7]

THE OPPORTUNITY FOR THE UK IN COMMERCIALISING CYBER RESEARCH

- The UK has a globally respected cyber security research base but underperforms on commercialisation and patent conversion. Cultural and structural barriers, particularly outside London and the South East, limit translation from lab to market.
- Example of CyberASAP: Acknowledging this challenge, the UK backs academic cyber commercialisation through initiatives like CyberASAP, supported by Innovate UK, which helps researchers develop market validated cyber ventures.

NW CYBER ECOSYSTEM – WHAT COULD IT LOOK LIKE?

Initiative	Location	Founded
MIT PROTO VENTURES	US	2019

MIT developed Proto Ventures — a lab-embedded venture creation model designed to turn academic breakthroughs into real-world, mission-driven companies. Rather than waiting for serendipitous spinouts, MIT proactively identifies research areas aligned with national challenges (e.g. defence, energy, AI), and forms ventures in collaboration with labs and experienced builders. This structured model offers lessons for UK regions like the NW seeking to systematise commercialisation and strengthen public impact.[1]

Initiative	Location	Founded
QUEEN MARY SOCIAL VENTURE FUND	UK	2020

The School of Business and Management launched the first student-led social impact VC fund investing in student-led social ventures in the UK. It is driven by the goal of creating societal impact through innovation and backs early-stage "startups for good". Student VCs advise and invest in real-life, early-stage startups that have a social mission. Students are encouraged to harness the opportunity to develop entrepreneurial skills with support from industry mentors and faculty. It is delivered in partnership with the Creator Fund.

Initiative	Location	Founded
NUS OVERSEAS COLLEGES	Singapore	2002

The NUS Overseas Colleges (NOC) programme enables graduates to have the overseas experiential learning and entrepreneurial development needed to kickstart entrepreneurial journeys. Participants are provided access to 25+ global innovation hotspots, with graduates placed within startups, whilst attending entrepreneurship courses at partner universities.

Initiative	Location	Founded
Isreal	Isreal	N/A

Israel's innovation pipeline, especially for cyber, draws from a deep-rooted military culture. More applicable to the UK and NW is how Israel combines tax incentives for local employment, deep investor networks, and tight university-industry collaboration to enable startups to scale quickly and showcase on academic campuses. The ecosystem is further strengthened by serial founders who reinvest their expertise and capital, while diversification into AI and quantum tech ensures continued global competitiveness.

Initiative	Location	Founded
IMPERIAL'S UNDAUNTED	UK	2010

Undaunted is a hub for the UK's climate innovation community, harnessing the motivator of innovative ideas addressing a societal need by creating new routes into green entrepreneurship. In partnership with the Royal Institution, Imperial is fostering a thriving innovation ecosystem for sustainable solutions to the climate crisis. They run bootcamps and demo days to help upskill budding entrepreneurs and maximise their access to world-class facilities, expertise and networks to embrace high-quality, deeptech solutions.

Initiative	Location	Founded
NORTHERN GRITSTONE: NG STUDIOS	UK	2022

Northern Gritstone as a VC is getting involved with spinouts earlier through NG Studios, a programme designed to support early stage startups to build an investible business. It enables more VCs to engage with academic spinout potential earlier, and help universities increase their technology readiness levels (TRLs). Each cohort member has a dedicated Northern Gritstone person supporting them with mentorship.

BARRIERS, OPPORTUNITIES AND RECOMMENDATIONS

"Funding comes back to people – there's a big mix of personalities and motivations"

- Mindgard at NW CyberCom x Investor Ladder Event

BARRIERS TO COMMERCIALISATION

To achieve meaningful and successful interventions, it is necessary to better understand the key barriers and blockers preventing academics from pursuing entrepreneurship. Through survey results from across UK academic institutions and regions, as well as targeted interviews, we have identified the key barriers which should be addressed through meaningful interventions.

THE SURVEY

- Over half of respondents (55%) to the survey claimed that their academic institution either had disorganised or inaccessible support, no support at all, or they were not aware of any available support.
- Not one respondent in the survey signalled that a barrier to academic entrepreneurship at their institution was due to a "fear of failure or risk taking".
- Most perceived the time constraints due to academic workload to be the main barrier, followed by "limited funding and resources for commercialisation activities" alongside "lack of entrepreneurial knowledge or skills among academics".

THE INTERVIEWS

- Academic time to pursue a viable business idea was highlighted as a key barrier. There are people who have great potential but don't have the mechanisms in place to support them through the next steps – and they may not be a suitable CEO / CTO for the venture.
- There is a lack of funding for opportunities, within universities and from external funding sources. Lack of funding is a challenge for all founders – however the academics have access to world class research labs to develop solutions which significantly minimises risk compared to non-academic entrepreneurs. Technology accessibility can also help lower this barrier, making it easier to launch a prototype and develop and test an MVP. More could be done to engage VCs at an earlier stage of startup development and upskilling academic entrepreneurs on alternative funding routes.
- There is a tension between the academic driver to publish research versus the commercial driver not to publish to protect the IP. There needs to be recognition and reward for academics moving towards commercialisation.

"

Providing less teaching/admin workload to allow people to focus on innovating.
- Survey

Currently the university focuses on [a] technology licensing model, which is a bit limited and maybe even outdated in my opinion.
- Survey

The IP issues at most UK institutions do not make it an attractive place for most academics or industry partners to commercialise existing research.
- Survey

You can't grow and scale a business part time.
- Interview

Truly high-potential ideas often lack the support structure needed to scale.
- Interview

There's a gap where you're too small for the VCs to get involved, and the only route seems to be grant funding.
- Interview

"

OPPORTUNITIES FOR NW CYBER ACADEMICS

Through the surveys and interviews, as well as desk based research, several opportunity trends emerged which should be a focus area for future interventions. Key themes identified include increased cross-ecosystem collaboration, harnessing untapped IP potential and considering dual-use technologies as a growth market,

Align Commercialisation With Wider Social Impact:

The majority of academics in the NW were motivated by making a tangible change for society through their research and as such, this lever is critical in shaping future interventions to support academic commercialisation. Funding and other support opportunities should be framed towards driving real-world societal impact.

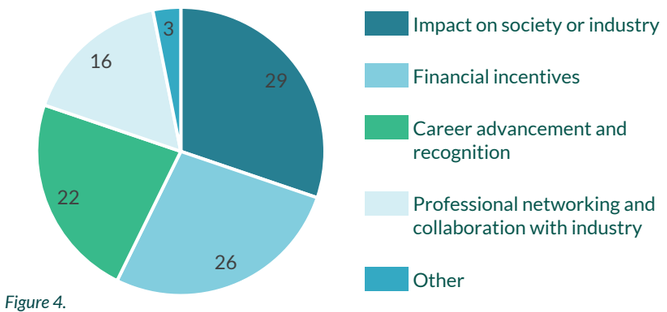


Figure 4.
Survey results asking for motivations to commercialise

Unlocking Underused Innovation for Societal Good:
A large portion of high-impact innovations linked to national security originate from publicly funded research, but much of this IP remains underutilised or uncommercialised.[1] A top down, managed IP process would help identify the diamonds in the rough – rather than academics self-selecting onto development initiatives. Early mover advantage is more important than having unutilised patents.

Leveraging Public Investment:
The UK can maximise the return on its R&D investment by embedding commercialisation strategies early in the research lifecycle, with clear pathways from lab to deployment in defence and resilience sectors.

Boosting Dual-Use Technologies:
There is clear scope to translate cutting-edge research in areas like cyber, AI, and quantum into technologies that serve both civilian and security purposes. Enhancing university capabilities and public research organisations to manage IP and support spinouts is critical to connect research with real-world applications.

Increase Government-Academic-Industry Partnerships:
Amid growing global pressures and declining public trust in institutions, closer government-university-industry collaboration is critical in supporting mission-driven ventures to deliver real-world impact in areas critical to public interest, economy and security.[2]

"Better access to specific resources made more widely available.
- Survey

If researchers see the money/capital available in industry they are more likely to consider a startup/spinout.
- Survey

More chances for post pre-seed funding
.- Survey

More chances for post pre-seed funding.
- Survey

An inventor is different to a founder – you can provide commercial support to inventors rather than positioning everyone as a founder.
- Interview

They want to make real world change… making an impactful change in an active way.
- Interview"

THE CORE NEEDS WE IDENTIFIED

Through analysis of desktop research, survey results from across the UK and interviews with a variety of stakeholders, we have distilled eight core needs academics have to enable the commercialisation of their research into innovative spinouts. Although some early stage funded support exists, e.g. ICURe, CyberASAP, few are North West specific, and many are having their scope reduced. The below needs are a current gaps which could be expanded upon, with future funded interventions.

Chief technology officer training:
Rather than focusing on becoming a Founder / CEO, enable academics to explore being a CTO and / or Co-Founder.

Mentoring programmes, networking and making connections:
Peer to peer learning is powerful and encourages entrepreneurial growth.

Dock into existing innovation challenges:
There are already open calls for innovative solutions to existing problems, across government and industry alike.

A safe environment to explore:
Make a safe environment for the academics to explore entrepreneurship and commercialisation, developing a rapid MVP or business plan on a page, without the commitment of having to leave academia. Cyberasap Pathfinder is a good example of an introductory bootcamp.

Product-market fit is essential:
Providing both the frameworks and tools (e.g. Marketing support, understanding product-market fit and how to get your product out there with target audience) to understand the theory and exposure to industry to understand user need.

Fractional expertise:
Bringing on board a suite of fractional CEOs / CFOs who could support multiple organisations would help steer academics on their commercialisation journey.

Create a virtuous circle:
Enable graduates to have early insight into spinout / startup experience; build on the success of the innovator in residence (IRR) model who have proven invaluable for commercial mentorship, facilitating introductions.

Enabling academics to have more time, and recognition:
"Trial and error during research doesn't define you, but failure through starting a business feels different." – Interview. Time was consistently identified as a barrier for academics to engage with entrepreneurship opportunities. Founding a business may not garner the same level of peer recognition as published research.

PROPOSED INTERVENTIONS FOR FUTURE FUNDING

We have identified some future intervention areas which would be beneficial to increase the culture of entrepreneurship within the NW, aligned with the eight core needs identified. This could be an extension of the NW CyberCom project, or a future funded initiative. If successful NW pilots are conducted, the initiatives could be rolled out across the UK. They could be funded in full as a large scale programme, or as individual strands of activity.

INITIATIVE	PURPOSE	SUGGESTED METHOD
STEM2CTO	A programme designed to upskill academics in how to be a successful CTO, rather thank focused solely on CEO / founder upskilling. This may be a more practical option for academics who are looking to engage with entrepreneurship but don't have the time or capacity to be the CEO of their startup, which we identified as the most prevalent barrier for academics pursuing commercialisation.	• A day long bootcamp • Executive mentorship from CTOs within NW cyber startup ecosystem • Virtual masterclasses • Co-founder matching events with other regions and institutions across the North West and UK
NorthWest NetWork	Peer to peer learning is powerful and encourages entrepreneurial growth and innovation, whilst access to a wider ecosystem facilitates new connections with industry, investors and startup mentors.	• A series of curated events • An opt in mentor pool to help connect aspiring entrepreneurs with like-minded support
Tech Transfer Bridge	Creating a physical and virtual hub that champions exploring new ideas, enabling a bridge to explore commercialisation in stages – without having to give up the day job. This would help academics balance the time commitment of pursuing entrepreneurship with day to day responsibilities. Support academics to address open innovation challenges within the Tech Transfer Bridge. This would help foster cross-departmental collaboration, e.g. with social sciences.	• Workshops, hackathons, sandbox events, bootcamp taster sessions • Enable academics to develop rapid MVPs or business plans on a page • Mentorship on how to respond to open calls and funding opportunities
Product-Market Fit Playbook	Creating a widely available playbook to act as a one stop shop guide for budding entrepreneurs, including checklists, case studies and matrix for how to approach market research, understanding product market-fit and competitor analysis.	• Create a compelling, visual and accessible playbook available digitally and physical copies • Launch event to upskill and raise awareness of playbook

INITIATIVE	PURPOSE	SUGGESTED METHOD
Innovators in Residence (IIR) and the C-Suite	Expand the IIR model, to expand the number of IIRs embedded within NW academic institutions. Establish a sector specific cadre of experience CEOs / CFOs who can support burgeoning spinouts with establishing a functioning business. Each C-Suite member could support multiple endeavours on a fractional basis. This would also help academics better refine costings for proof of concepts and MVPs, essential for future funding opportunities.	• Recruiting more sector specific exited founders (IIRs) to support the commercialisation of projects • Additional funding is required to support their salaries / fees within the institutions • Onboard sector specific experienced CEOs and CFOs willing to support spinouts on a fractional basis • Office hours, workshops, mentorship
Graduate Training Scheme	Support recent graduates with a training pathway, to give them hands on entrepreneurial experience.	• Source and support work experience, internships, job shadowing, apprenticeships into spinouts / startups
Entrepreneurship Pathway	To address a key barrier for entrepreneurship which is the perceived lack of peer recognition versus e.g. academic publication, attracting more academics to entrepreneurship.	• Creating a recognised pathway that celebrates the achievements of entrepreneurial academics • Utilising comms and marketing to garner external recognition
Upskilling Tech Transfer Officers	It would be beneficial to upskill TTOs with industry demand for novel technology applications and creating startups. This would help TTOs to identify where existing, and new, patents could have an impactful commercial application.	• A modular programme of experiential learning • Placements / secondments • Industry mentorship
Ambassador Programme	Feedback from interviews has stated the benefits of having an ambassador programme to motivate those who may be inclined to self-select out of entrepreneurial initiatives or not engage because they do not see it as an option for them. It can improve diversity of projects from different backgrounds and departments. This has worked well for Teeside's Launchpad programme, who have supported 700 new businesses.	• Identify ambassadors – successful individuals who have completed entrepreneurship programmes like NW CyberCom, CyberASAP, ICURe • Conduct PR, marketing and comms campaigns sharing their story • Run a series of engagement events with the ambassadors, including drop in clinics

APPENDIX A

"How can you create a bridge to explore commercialisation in stages - making it okay to turn back?"

- Interview

A VIEW OF GLOBAL ACADEMIC COMMERCIALISATION

Amid ongoing geopolitical uncertainty, global trends in policy, culture, and investment will impact on the successful commercialisation of research. The UK's ability to translate academic cyber research into secure, high impact innovations will be key in achieving digital sovereignty, national resilience, and economic growth.

	GROWING INTERNATIONAL SUPPORT	VARYING INTERNATIONAL FUNDING MODELS	DIFFERENT REGULATORY & LEGISLATIVE REQUIREMENTS
	Nations are embedding academic commercialisation within broader economic, security, and innovation strategies. Few ecosystems are mature; most are actively developing.	While UK spinout investment is growing, translational and core research funding is under pressure—unlike more inflation-proofed and strategic international models.	Clear, consistent, and founder-friendly IP and spinout policies are essential for rapid and equitable commercialisation. The UK is improving, but still uneven compared to global leaders.
UK	• Spinouts growing, but ecosystem fragmented beyond London–Oxford–Cambridge. • Initiatives like CyberASAP and Northern Gritstone show promise but require stronger systemic support.	• Spinout investment rose to £5.3 billion in 2021, but QR funding fell 16% in real terms since 2010. • HEIF (Higher Education Innovation Fund) delivers strong returns (£14.80 per £1), but caps limit impact.	• Spinout deals average 10–12 months; equity terms still inconsistent. • Recent reforms (e.g. USIT Guide) aim to improve transparency and speed.
US	• Bayh-Dole Act gives universities ownership of IP from federally funded research. • Private sector is increasingly driving innovation at major hubs.	• Substantial public investment e.g. the CHIPS and Science Act $280 billion authorised. • Large philanthropic and VC ecosystems.	• Bayh-Dole simplifies IP ownership; legal clarity supports rapid licensing. • Institutional flexibility supports founder-friendly deal terms.
ISREAL	• Military-academic-commercial pipeline centred around Unit 8200 and Innovation Authority. • Rapid IP commercialisation is supported by national policy and early-stage public funding.	• One of the highest R&D spenders per GDP globally (~5%). • Commercialisation is aligned to national defence goals.	• Unified IP policies and national strategy enable fast, security-aligned spinouts. • Strong state backing for institutional tech transfer.
SINGAPORE	• RIE2025 strategy aligns research with national goals (cyber, health, sustainability). • Centralised planning, integrated IP management, and public-private co-investment.	• £15billion (S$25billion) committed through RIE2025 to strategic R&D priorities. • Long-term, centrally managed, and commercially focused funding.	• Integrated IP frameworks via A*STAR and national innovation agencies. • Efficient legal and licensing environment tailored to high-tech sectors.

INTERNATIONAL CYBER RESEARCH AND PATENT DATA

The tables below correspond to the graphs that visualise the cyber related academic research publications for the US, UK, Israel and Singapore, as well as for cyber related patent application. These countries were selected to demonstrate the different emphases across hugely varied economies and political, cultural contexts.

CYBER RELATED RESEARCH PUBLICATION METHODOLOGY

Step 1: Search Strategy Development
A search string was created using explicit cyber security related terms (e.g., “cyber threat detection”, “zero trust architecture”, “machine learning for threat detection”), excluding unrelated keywords (e.g., “cyberbullying”, “cyber law”, “medical”) and acronyms to ensure relevance. This string was applied on the Scopus database.

Step 2: Data Extraction by Filters
The results were filtered to include only journal articles and conference papers, fully published, in English, and within the Computer Science subject area.

	2019	2020	2021	2022	2023	2024	CAGR (%)
US	4338	4059	3959	4327	4645	5513	4.1
UK	1114	1082	1187	1355	1515	1690	7.2
Isreal	171	144	151	157	181	182	1.0
Singapore	224	329	342	407	441	521	15.1

Step 3: Data Preparation
Publication data was extracted by affiliated country and year, enabling cross-country comparisons and temporal analysis with the CAGR as a standardised measure of growth.

CYBER RELATED PATENT SEARCH METHODOLOGY

Step 1: Search Strategy Development
A search string was created using explicit cyber security related terms (e.g., “cyber threat detection”, “zero trust architecture”, “machine learning for threat detection”), excluding unrelated keywords (e.g., “cyberbullying”, “cyber law”) and acronyms to ensure relevance. This string was applied on the Espacenet patent database.

Step 2: Data Extraction by Geography and Year
Patent publication counts were retrieved based on the applicant country for four countries (US, UK, Israel, Singapore), covering the years 2019 to 2024.

	2019	2020	2021	2022	2023	2024	CAGR (%)
US	74460	76826	75890	73044	73044	71448	-0.7
UK	803	679	778	713	734	689	-2.5
Isreal	408	611	1918	1971	1836	1767	27.7
Singapore	216	294	367	313	351	372	9.5

Step 3: Growth Rate Calculation
The CAGR was calculated for each country using the 2019 and 2024 patent counts. This provided a standardised measure of growth in cyber security related patent activity over the six-year period.

APPENDIX B

"There is so much appetite to invest in UK-based cyber companies, but simply not enough companies to invest in."

- Early-stage VC investor

CYBER ACADEMIC SPINOUT UNIVERSITY EQUITY

An analysis of Beauhurst data on the university equity stakes across the 32 digital security spinout companies that have an active companies house status, have not exited, and have spun out of a UK university.

Company name	Description	Head Office Region	University	Equity stake (%)
Anonymised	Anonymised develops blockchain technology designed to enable companies to securely collect and manage useful customer data.	London	The University of Nottingham	0
Cavero Quantum	Cavero Quantum develops a quantum platform which provides cyber security services.	Yorkshire and The Humber	University of Leeds	50
Cyacomb	Cyacomb develops digital forensics software which speeds up the process of scanning computers seized by the police for signs of criminal activity.	East of Scotland	Edinburgh Napier University	30
CyberOwl	CyberOwl develops software to detect early warnings of cyber attacks, specialising in maritime.	West Midlands	Coventry University	30
Darktrace	Darktrace utilises AI to monitor and protect digital assets through a cyber security software platform.	London	University of Cambridge	0
Freevolt Technologies	Freevolt Technologies develops smart cards and other biometric technology for access control and fraud prevention, utilising existing radio frequency energy.	South East	Oxford University	5
KETS Quantum Security	KETS Quantum Security develops technology that uses quantum key distribution and random number generation to increase digital security.	South West	The University of Bristol	2
Lupovis	Lupovis develops cyber security software which deploys decoys to lure would-be attackers.	West of Scotland	The University Of Strathclyde	4
MemCrypt	MemCrypt develops cyber security software that detects ransomware attacks.	East of Scotland	The Court Of Edinburgh Napier University	20
Metrarc	Metrarc develops technology that aims to tighten data encryption security on networked devices, including wearables and IoT devices.	East of England	University of Kent & University of Essex	40
Mindgard	Mindgard develops cyber security software that aims to protect businesses that use AI technology.	London	University of Lancaster	8
MulSys	MulSys provides secure signal processing services for both wired and wireless communication systems, providing privacy protection mechanisms for IoT amongst other services.	London	University of Surrey	10
Nettoken	Nettoken has developed digital identity software so users can securely manage all their online accounts and passwords from one dashboard.	London	Royal College of Art	6
nisien.ai	nisien.ai develops technology utilising AI, providing online security protection including tracking and monitoring of threats.	Wales	Cardiff University	12
Nu Quantum	Nu Quantum develops quantum networking technology, aiming to improve the efficiency and scalability of quantum computers.	East of England	University of Cambridge	6
Optalysys	Optalysys develops optical processors with applications in big data, supercomputing and data security, making use of lasers and gel-filled cells to encode and analyse large amounts of data.	Yorkshire and The Humber	University of Cambridge	0

Company name	Description	Head Office Region	University	Equity stake (%)
OSIRT	OSIRT develops open-source digital research software for the collection of evidence in cyber-crime investigations.	East of England	University of Hertfordshire	11
PhishAR	PhishAR develops mobile apps for digital security, specialising in two-factor authenticator software utilising augmented reality and artificial intelligence.	South East	University of Oxford	30
PIB-d	PIB-d develops software that is designed to give internet users more control over their individual data, by using a Personal Data Service.	South East	University of Hertfordshire	18
PQShield	PQShield develops cyber security technology using post-quantum algorithms.	South East	University of Oxford	30
ProofID	ProofID develops identity access management software designed to ensure the security of its clients' digital userbase.	North West	University of Salford	6
Quantum Base	Quantum Base develops online security technology using quantum mechanics.	North West	Lancaster University	0
Quantum Dice	Quantum Dice develops a quantum-based numbers generator that aims to be commercialised for cyber security purposes.	South East	University of Oxford	10
Raven Science	Raven Science develops software that uses machine learning to identify far-right, extremist content posted on social media and video hosting platforms that violate their terms of use.	London	City University of London	5
Safe Intelligence	Safe Intelligence develops software for AI security.	London	Imperial College London	5
Seclea	Seclea develops technology designed to audit decisions made by AI.	South East	Royal Holloway, University of London	7
Securium	Securium develops secure applications for data analytics and delivery.	South East	University of Surrey	3
Spyderisk	Spyderisk develops automated cyber risk assessment software.	South East	University of Southampton	Not available
Tenyks	Tenyks develops a software platform which aims to automate machine learning development and operates a visual search engine.	East of England	Cambridge University	Not available
Veiovia	Veiovia develops digital privacy technology for blockchain and Web3.	Yorkshire and The Humber	University of York	25
Wifi Securities	Wifi Securities develops security software designed to protect its users' data when they connect to public WiFi hotspots.	North West	University of Liverpool	Not available
ZORB Security	ZORB Security develop software that monitors cyber security data.	London	Anglia Ruskin University	Not available

APPENDIX C

"In the late 90s, most people with an MBA went into a corporation - this wouldn't be the case now – it's more likely to be about half would go straight into corporate world. There's more of an expectation of entrepreneurship."

- Interview

COMMERCIALISATION SURVEY AND INTERVIEWS

In order to inform our research, we circulated a survey and arranged 1:1 interviews. We have kept individuals anonymous, but have provided the organisations and where possible department below.

Survey Response Organisation	Survey Response Department(s)
Lancaster	Computer Science, Neuroscience, Epidemiology, Physics, Statistics, Marketing, Management Science, Research Software, Mathematical Sciences, Health/Medicine, Linguistics, Cyber Security, Statistics, AI
Bangor	Public Health and Biosecurity
Nottingham Trent	Psychology
University of Bath	Behavioural Science
Liverpool	Chemistry, Neuroimaging
Francis Crick Institute	Medicinal Chemistry
Nottingham	Computer Science
Cambridge	Computer Science, Criminology
Surrey	AI
Imperial	Chemistry
Salford	Cyber Security
Manchester	Software and AI
Multiple	Cyber Security, AI, Chemistry
London Metropolitan	Cyber Security
Derby	Security
Durham	Science and Engineering
Loughborough	International Relations, Political Science, Creative Industries, Design Engineering

Survey Org	Department
Strathclyde	Professional Services
Manchester Metropolitan	Computer Science
Bristol	Chemistry
Bath	Computer Science
King's College London	Security Studies

Interview number	Organisation
Strathclyde	Professional Services
Manchester Metropolitan	Computer Science
Bristol	Chemistry
Bath	Computer Science
King's College London	Security Studies

RECOMMENDED AREA OF FOCUS FROM THE SURVEY

The survey asked respondents "What do you believe would help your institution better support and promote academic entrepreneurship?" The below is a summary of the key themes identified through the 46 responses analysed.

THEME	IDEAS
There is more upskilling required	Increased number of seminars and workshops to drive increased awareness on entrepreneurship. For example, teaching buy outs and more in-depth training, integrating academic entrepreneurship into the workplan or curriculum. Mentorship would be highly valued. This upskilling would be beneficial for both staff and academics. It would be helpful to see initiatives at a departmental level, potentially inviting faculty members to get involved with current projects to contribute and learn.
Academic workload does not enable the time to focus on entrepreneurship / commercialisation	Flexible means to enable academics to log entrepreneurship as a legitimate time commitment when assigning tasks. There needs to be career progress attached to entrepreneurship activities. More support to manage academic research whilst going through commercialisation would be beneficial, an example being increase administrators to relieve admin burden on academics to allow more time to pursue entrepreneurial activities. A culture of allowing sabbatical time to be devoted to attempt founding a startup. Emulating the US model, where academic know how can be licensed so they can benefit financially without losing their academic career.
University equity stakes are disincentivising	A transparent and fair split of ownership and shares between the university and the co-founders, weighted towards the co-founders. A licensing model is lower risk but also lower return, whereas putting energy and time into more scalable and ambitious initiatives (unicorns) could be beneficial. Move away from equity shares that disincentivise, and towards realising the benefits of economic growth for the region, society and national economy. Better engagement with external support (e.g. business) would help validate ideas quicker
The institutional culture is too risk averse to support those who want to pursue entrepreneurship	Institutions can better support and promote risk taking to support the change of career from academic to founder. Leadership need to champion entrepreneurial missions with hands-on experience of innovation. Having knowledgeable staff who can help with the nuts and bolts of establishing a business, and to guide the engagement with the market and demand of industry.
More investment is required to scale spinouts	Currently, funding opportunities are limited, covering a small amount of academic time and there is limited central public funding – which makes each grant or programme very competitive. More substantive and consistent funding opportunities would drive more impactful results. An example would be to focus funding opportunities for post pre-seed funding – for example those who have developed a successful proof of concept. Increased engagement between venture capital and researchers would be beneficial, as well as linking between regional initiatives and bigger investment hubs (e.g. London).
Increased guidance and access to frameworks would be helpful	Strategic support and clear guidance would clearly spell out the relationship between financial incentives and workload, IP rights and dedicated admin structures. Helpful guidance would include IP and commercialisation guidance within an academic environment. More outreach to postdocs and PIs to explore entrepreneurship activities.

RECOMMENDED AREA OF FOCUS FROM INTERVIEWS

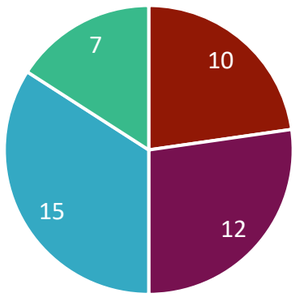
The survey asked respondents "what do you believe would help your institution better support and promote academic entrepreneurship?" The below is a summary of the key themes identified through the 46 responses analysed.

THEME	IDEAS
It is a tension between juggling an academic career and becoming an entrepreneur: and startups require a lot of time from founders	Rigorous assessment of candidates for training, upskilling and development programmes to ensure the most commercially minded are supported. Different roles in businesses should be explored e.g. do they want to participate full time or part time? As CEO or CTO? The simple, easy things get done but the boring, 'hard stuff' – the basics – can be pushed to the back burner. Market validation and networking requires a time investment but can be seen as a nice to have.
Motivations for academics to pursue entrepreneurship and commercialisation are varied, but having a social impact is a key driver	It's okay to explore commercialisation without a grand plan in place. You can still be an inventor and not be a founder – and we need to allow space for those two roles to co-exist. Academics want to make real world change by shaping and solving the problem to make an impactful outcome. Academics are not always motivated by financial return; whereas there is a greater institutional emphasis on prestige and research kudos. Graduates and students tend to be more interested in commercialisation than academic staff, particularly if part of an enterprise institution.
Lack of available funding and other support is an issue to support the most exciting projects	Academics are less inclined to pursue entrepreneurship; especially is the university take a large equity stake in spinouts. Spinning out isn't the only viable option – academics need reassurance and confidence to overcome barriers. In some institutions, there is a perception that entrepreneurship programmes are just 'a bit of fun' and less important than other academic work. Truly high potential ideas often lack the support and structure they require to scale. Ecosystem design can help prevent innovative ideas from falling through the cracks, e.g. tailored competitions and dedicated support to boost engagement.
The lifecycle of IP and IP management could be reviewed	Early mover advantage is more compelling commercially than a patent. A commercial business would take a very different approach to IP lifecycles – with processes to sift the most commercially advantageous IP for development. Changes to IP processes are happening, but not quickly enough. Universities shouldn't be the seed investment mechanism but can support with IP development. An upskilling programmes for tech transfer officers, to help them create the bridge between patents and how they can be applied to an application.
Product-market fit should be the first challenge to address – partnerships with industry are essential	Often funding may be to develop a product or service, but focusing on the market's need for a solution is critical to enable a fail fast culture. Lots of programmes focus on leadership, but product market fit and engaging the market in the real world is far more valuable – especially building a strong network. There should also be access to support on how to appropriately cost out developing a minimum viable product to help secure funding. Partnerships with industry are critical to encourage technology adoption and understand the market and competitor landscape. Working with industry is essential to scale solutions in the UK. Corporates with innovation challenges can benefit from convening pre-existing ideas.

SURVEY GRAPHS

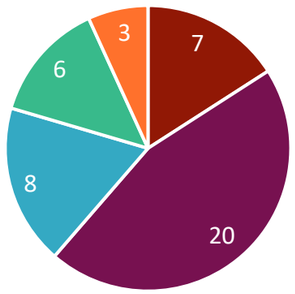
We comprised a survey which was shared across UK institutions to answer a series of questions about the culture of entrepreneurship and commercialisation (44 responses). We also shared a separate survey with those of the NW CyberCom programme (2 responses). The following graphs outline the responses to the first survey.

How aware are you of the entrepreneurial resources available within your institution (e.g., incubators, funding opportunities, mentorship)?



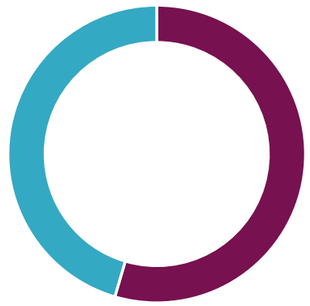
- Very aware
- Aware
- Somewhat aware
- Not aware

How would you describe the culture around commercialisation and entrepreneurship at your institution?



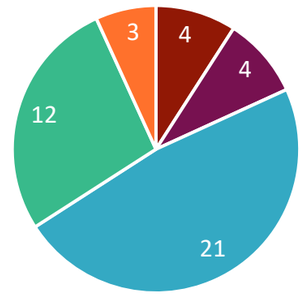
- Very supportive and actively encouraged
- Supportive, but not a major focus
- Neutral
- Somewhat discouraging
- Very discouraging

Have you engaged with any entrepreneurship activities within your institution?



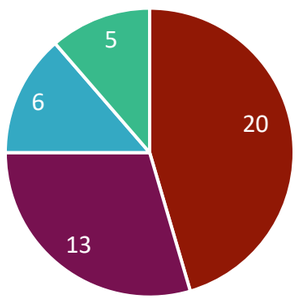
- Yes
- No

How would you rate the level of entrepreneurial activity among academics at your institution?

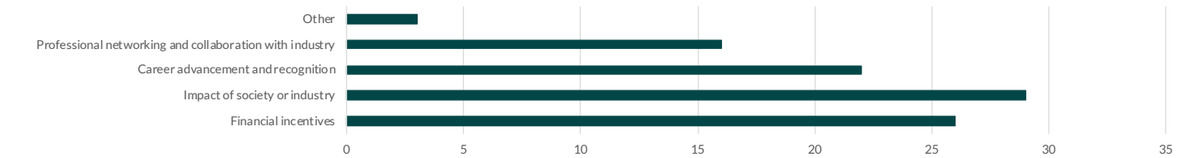


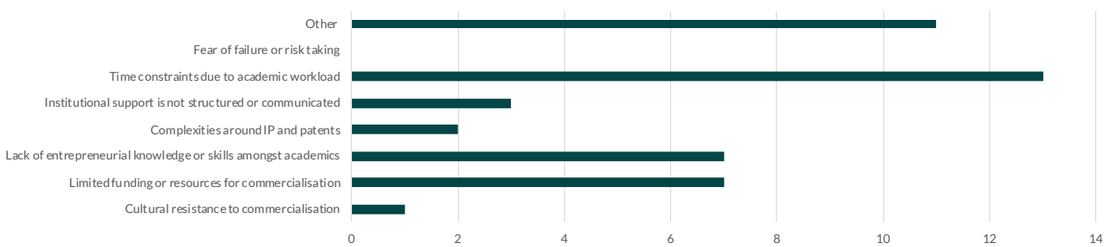
- Very High
- High
- Moderate
- Low
- Very Low

Does your institution provide specific support for academics to commercialise their research?



- Yes, with dedicated teams/resources
- Some support but not well-organised or easily accessible
- No, there is little to no support
- Not sure





APPENDIX D

"The culture varies - every single university is different."

- Interview

ACRONYMS

Survey Response Organisation	Survey Response Department(s)
ACEs-CSR	Academic Centres of Excellence in Cyber Security Research
AI	Artificial Intelligence
CAGR	Compound Annual Growth Rate
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CSA	Cyber Security Agency (Singapore)
CTO	Chief Technology Officer
DARPA	Defense Advanced Research Projects Agency (United States)
DIS	Digital and Intelligence Service (Singapore)
DiSH	Digital Innovation Security Hub
DSIT	Department of Science, Innovation and Technology
EV	Electric Vehicles
HEIF	Higher Education Innovation Fund
IIR	Innovator in Residence
IP	Intellectual Property
IPO	Initial Public Offering
LENS	Lancaster Environment for New Security
MVP	Minimum Viable Product
NCF	National Cyber Force
NCSC	National Cyber Security Centre
NIH	National Institute of Health (United States)
NOC	National University of Singapore Overseas Coleges
NUS	National University of Singapore
NW	North West
OfS	Office for Students
R&D	Research & Development
REF	Research Excellence Framework
SME	Small to Medium-sized Enterprise
TRLs	Technology Readiness Levels
TTOs	Tech Transfer Officers
UK	United Kingdom
UKRI	UK Research and Innovation
US	United States of America
VCs	Venture Capitalists

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