CYBER SECURITY EARLY CAREER PROFESSIONALS MONTHLY WEBINAR AND NETWORKING SERIES

Organised by Information Security Specialist Group (BCS-ISSG)
Consist of career stories and presentations/workshops delivered by Cyber Security Early Career Professionals from around the world. The event is open for all.

August talk: **Cyber Security beyond classical IT: Cyber Security experience in Automotive and Banking Sectors**

Speaker: Nacho Fernandez, Cyber Risk Manager in Commercial Banking, Lloyds Banking Group

Agenda:

15:00 - Introductions & Networking
15.15 - Presentation & Discussion
- Academic and Professional Background
- The Case of Cyber Security in Automotive Sector
- Cyber Security experience in Banking Sector

16:00 - Close of event

Moderator: Dr. Deepthi Ratnayake, Senior Lecturer, University of Hertfordshire

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Introductions & Networking

Please feel free to introduce yourselves through video/voice/chat

- Name

- Line of study/work

- What are you expecting to achieve today?

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ABOUT MYSELF

Academic Background

- BSc Digital Forensics and Cyber Security @ London Met

- MSc Information Security @ UCL

  - Dissertation: The drives of UK firms' investment in Cybersecurity. A strategic approach

- PhD Candidate @ Cyber Security Centre, WMG, University of Warwick

  - Topic: Cyber Security in Smart Vehicles

ABOUT MYSELF

Professional Background

- Senior Cyber Security Engineer @ Electrical, Electronic and Software Engineering, Jaguar Land Rover

- Cyber Risk Manager @ Commercial Banking, Lloyds Banking Group

CASE: CYBER SECURITY IN THE AUTOMOTIVE SECTOR

LLOYDS BANKING GROUP

Cyber security in automotive differs form classical IT security, the main differences are:

- Safety considerations and hazards on a vehicle; to the occupants, other road users…

- Low Computational power; limited space and weight considerations

- Embedded devices and actuators; transforms into actions

- Close circuit (Close System) – Vulnerable to physical attacks.

- Open connection (Open System) – Vulnerable to external attacks.
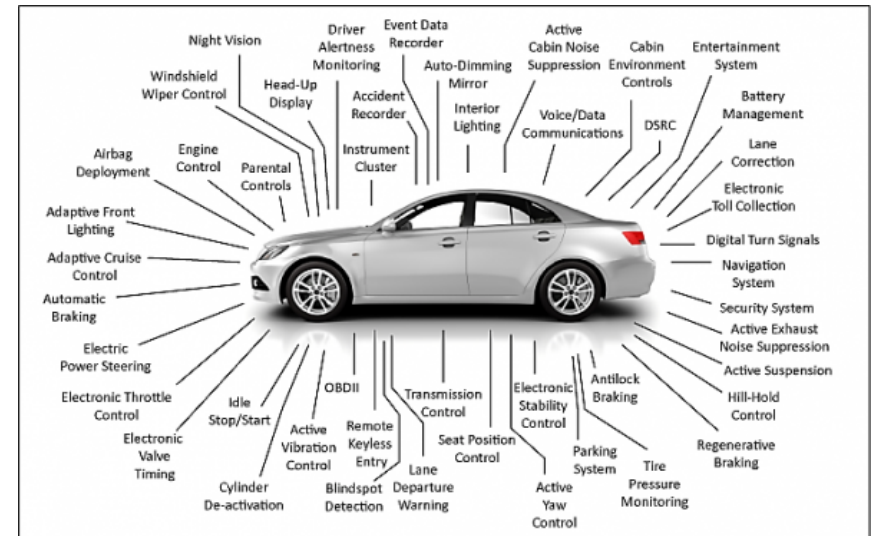
New technologies, systems and regulations on automotive security, made that cyber security a **must** in the automotive space
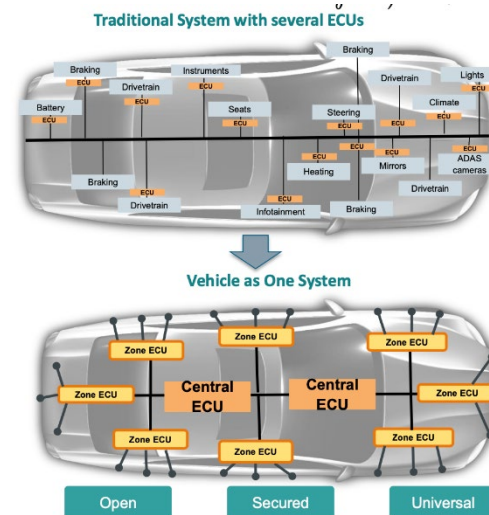
CYBER SECURITY IN THE AUTOMOTIVE SECTOR

- ## Automotive and heterogeneity of components

Automotive, as similar as other industries, has experience a digital transformation in the last decade. Nowadays cars can do much more than taking a passenger from *A* to *B,* new features and technologies has enable to make a more connected and safe cars. A vehicle has a very different set of ECU (Electrical Control Units):
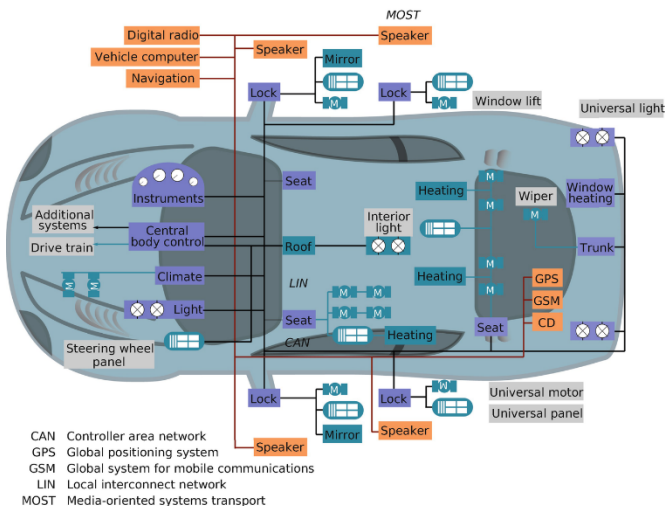
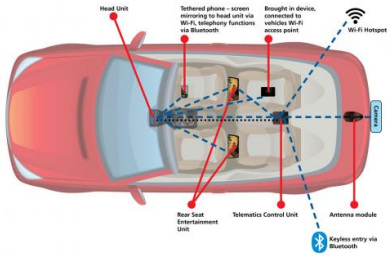Vehicle architecture and mayor components from ~2000

To enable more features, Automakers have opted for a more software centric approach, rather than more ECUs

CYBER SECURITY IN THE AUTOMOTIVE SECTOR

New vehicle technology

Internal Vehicle Communications

Mobile Applications for managing the Vehicles

Vehicle Communications
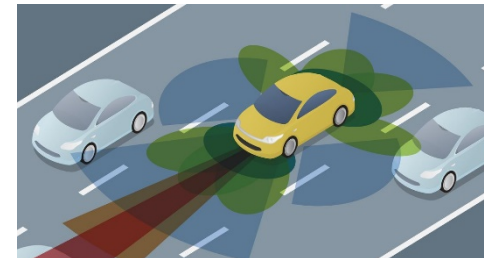

Keyless Entry Systems

New Infotainment and HMI technology


Over the air updates and Diagnostics

Autonomous Vehicles

CYBER SECURITY IN THE AUTOMOTIVE SECTOR

New Technology poses threats and Hazards if it is not properly secure:

- Hacking of vehicles: Remote controlling, accessing or tampering of any of the vehicles functions

- Disable of features

- GDPR and privacy breaches

- Physical security of the vehicle, their occupants or content

- Hazards and accidents provoke by malfunction of vehicles….
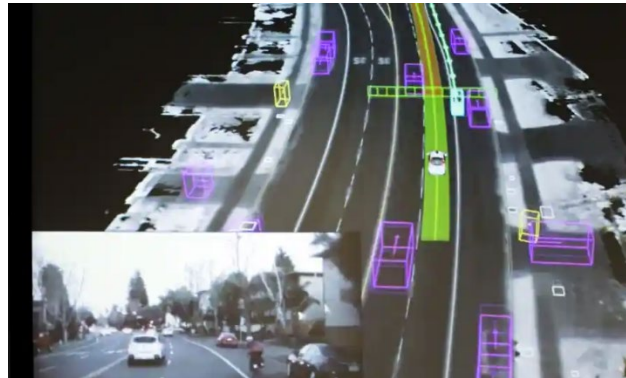
CYBER SECURITY IN THE AUTOMOTIVE SECTOR

Researcher team take remote control of Tesla Model S from 12 miles away:

Back on 2016, a group of Researches from *Keen Security Lab*, successfully discovered multiple security vulnerabilities and successfully implemented remote, aka none physical contact, control on Tesla Model S (**unmodified**) in both **Parking and Driving Mode**.

They were able to **remotely unlocking the vehicle**, **remotely braking**, **fold the mirrors**, open sunroof, move seats, turn on indicators, **disable the infotainment screen**…

Tesla took action and patched all the affected vehicles

Video of the hack: https://www.youtube.com/watch?v=c1XyhReNcHY

CYBER SECURITY IN THE AUTOMOTIVE SECTOR

LLOYDS BANKING GROUP

My Research topic of Cyber Security in the automotive sector, looking at:

Application and standardisation of cyber security in the automotive sector (Security framework and procedures…)

New challenges that arise with the introduction of v2v/v2x communication and the IoT devices

How it all fit with the vision of Smart cities

Maintenance of Cyber Security in the life cycle of the product
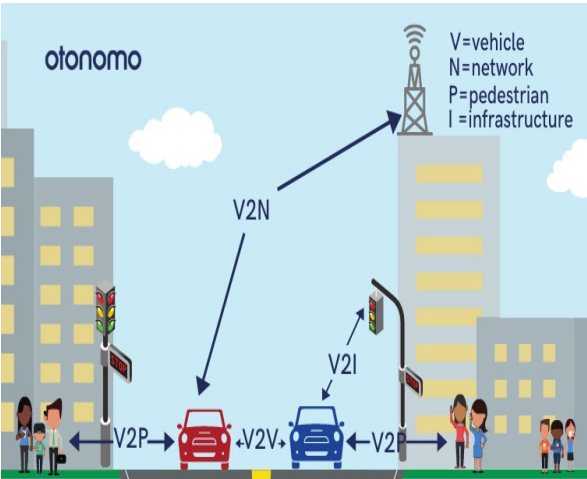
CYBER SECURITY IN THE BANKING SECTOR: CHALLENGES THAT COMPANIES FACE

In the banking industry (**commercial side**) we deal with clients in all the sectors, for example:

- Agricultural
- Communications
- Construction
- Education
- Electrical
- Financial
- Food, Drink & Consumer goods
- Healthcare
- Manufacturing
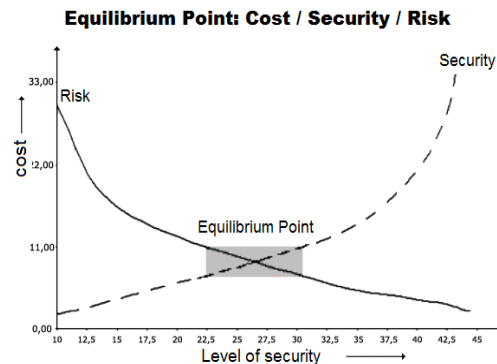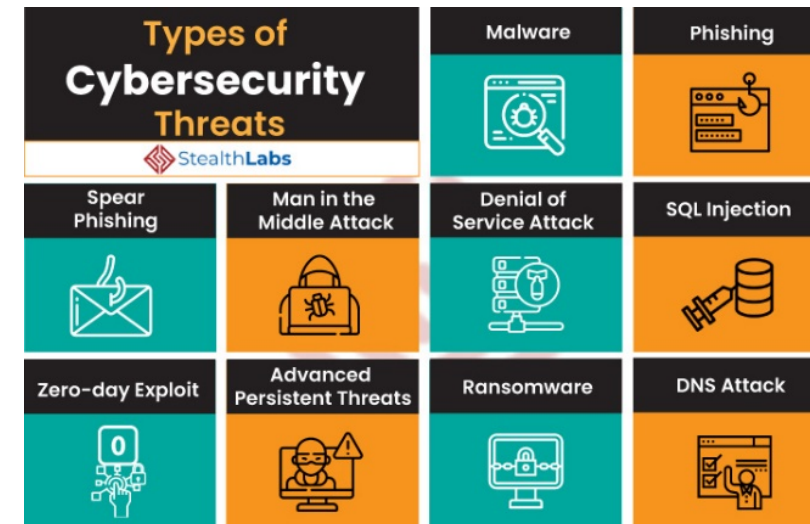- Pharmaceutical
- Real State and Property
- Oil and Gas…

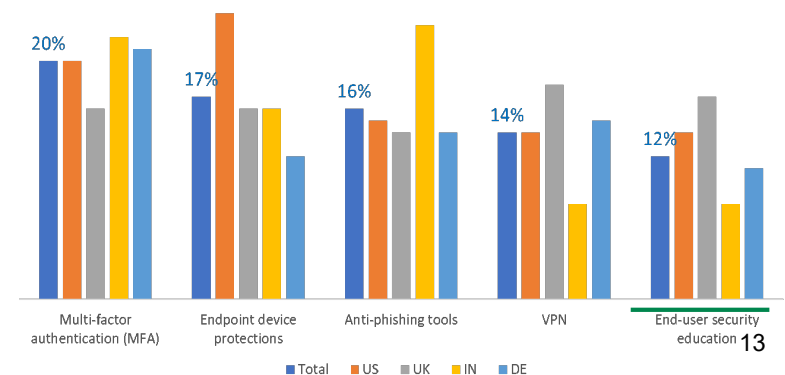# CYBER SECURITY CHALLENGES THAT COMPANIES FACE

Pre-emptive measures

- What types of controls to invest and how much (Security/cost ratio)

- How to maintain security level against: new attacks, zero-day vulnerabilities, new threats, supply chain and third party…

Top 5 Cybersecurity Investments Since Beginning of Pandemic
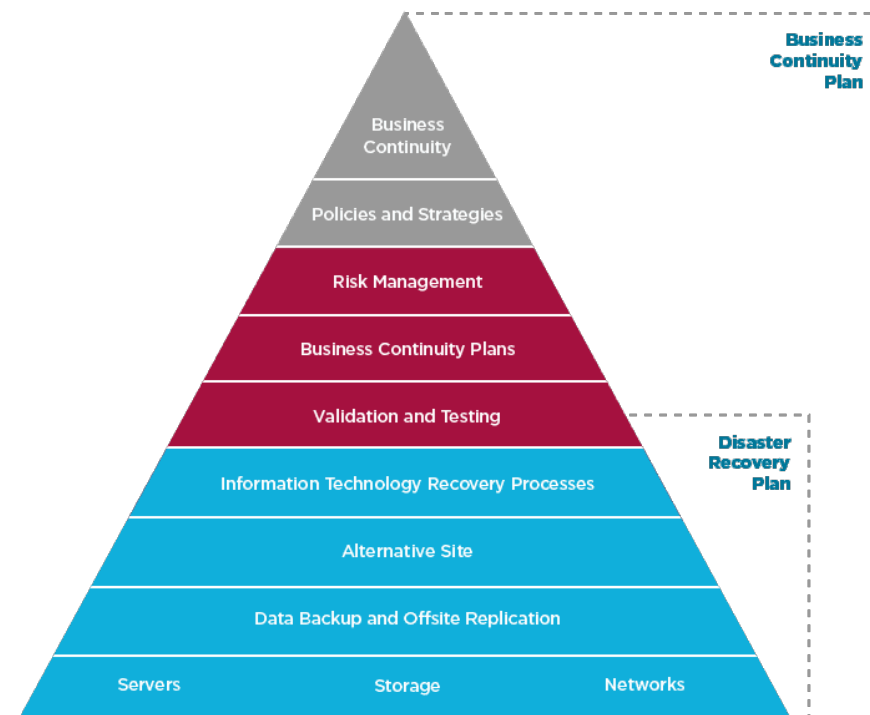*Ranked by % selected among Total*

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CYBER SECURITY CHALLENGES THAT COMPANIES FACE

Post incident measures

- How to get back online as fast as possible?

- What type of services will I need?

- Regulatory bodies and fines?

- Liquidity plan

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CYBER SECURITY CHALLENGES THAT COMPANIES FACE

Things that we do for cyber security in the client space;

- We have cyber security embedded as part of the credit process of lending money. We look at the cyber risk rating, risk factors, vulnerabilities of the clients, also we do sector comparisons…

- We look at liquidity plans, cyber insurance and other Business continuity options.

- Client engagement in incidents, working with the clients to maintain any essential services provided by the bank

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CYBER SECURITY CHALLENGES THAT COMPANIES FACE

Destructive Cyber Attacks: Maersk Cyber Attack (2017)

In June 2017, Maersk fell victim to a major cyber-attack caused by the NotPetya malware. The attack was reportedly created huge problems to the world's biggest carrier of seaborne freight. The attack had caused outages in their computer systems across the world. There was 100% destruction of anything based on Microsoft that was attached to their network.

Back then they said that their "**recovery plans didn't account for the global destruction of everything**", and they "**force to come back to basics and do everything on paper**".
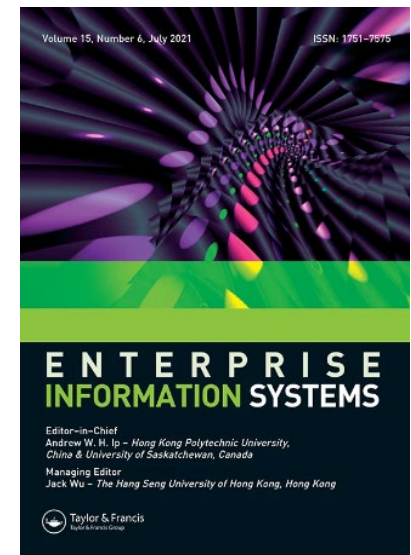
CYBER SECURITY CHALLENGES THAT COMPANIES FACE

Trends/topics emerging in the Cyber Security space that companies faces:

- Destructive attacks for businesses (ransomware)
- The new focus of attacks on national critical infrastructure (cyber warfare)
- SMEs being part of the supply chain or third/fourth party
- Vulnerabilities on IIoT (Industrial Internet of Things) and ICS (Industrial Control Systems) & SCADA (Supervisory Control And Data Acquisition)
- Quantum computing and Quantum cryptography
- The reliance on Cloud Computing
- AI and ML…
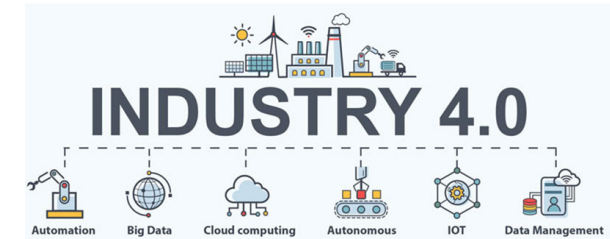
Latest paper release: The severity and effects of Cyber-breaches in SMEs: a machine learning approach. Link: https://www.tandfonline.com/doi/full/10.1080/17517575.2021.1942997

Q&A

Details

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- Scholar: https://scholar.google.com/citations?user=S0BOYeEAAAAJ&hl=es

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If you are an inspiring early career professional in Cyber Security and you would like to share your knowledge and exciting career journey story through this webinar series, please get in touch with

Dr. Deepthi Ratnayake (d.ratnayake@herts.ac.uk)

Early career professionals can be, but are not limited to graduates, and apprentices or those who have changed careers.