Human-
Centred
Cyber
Security

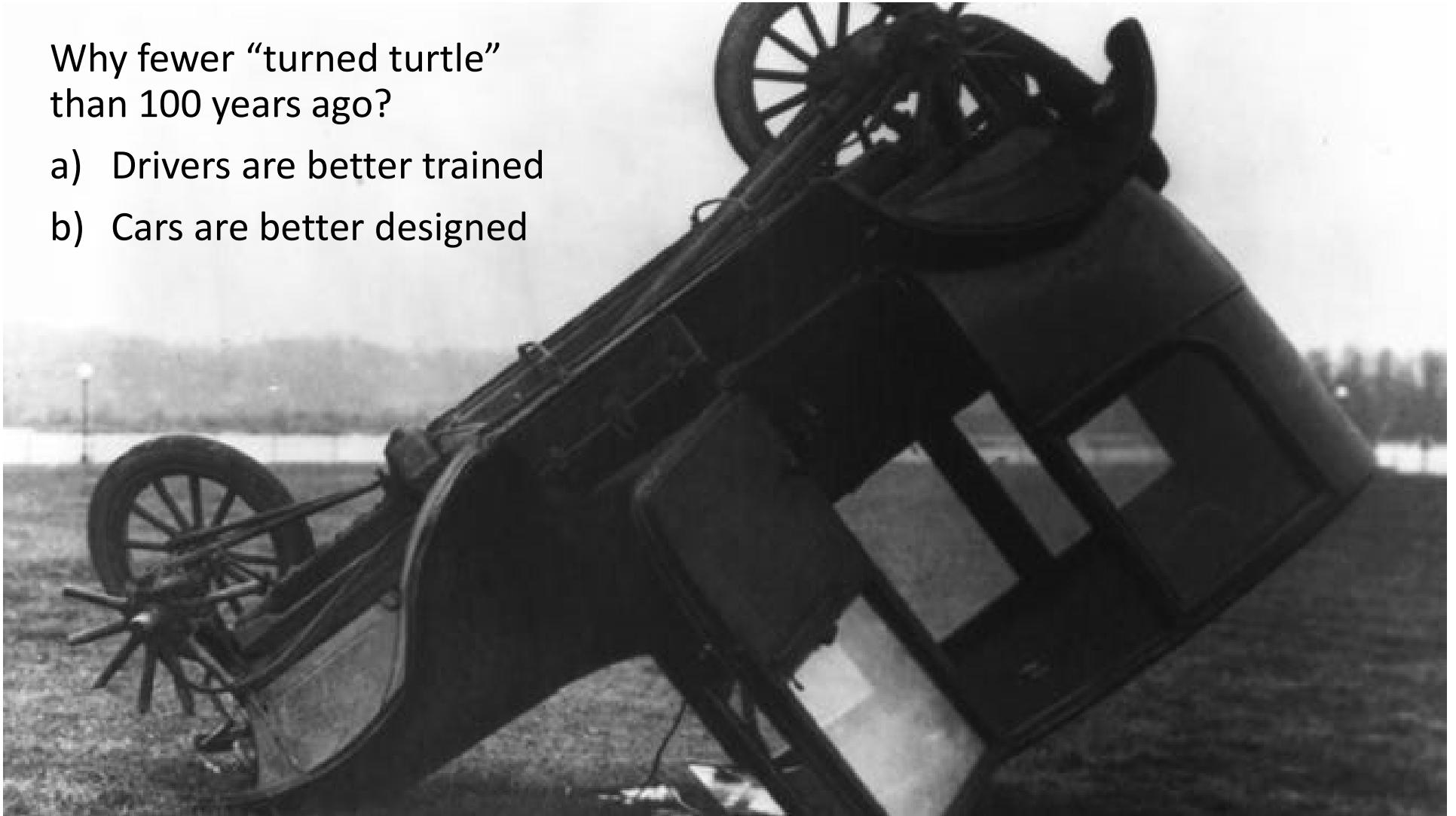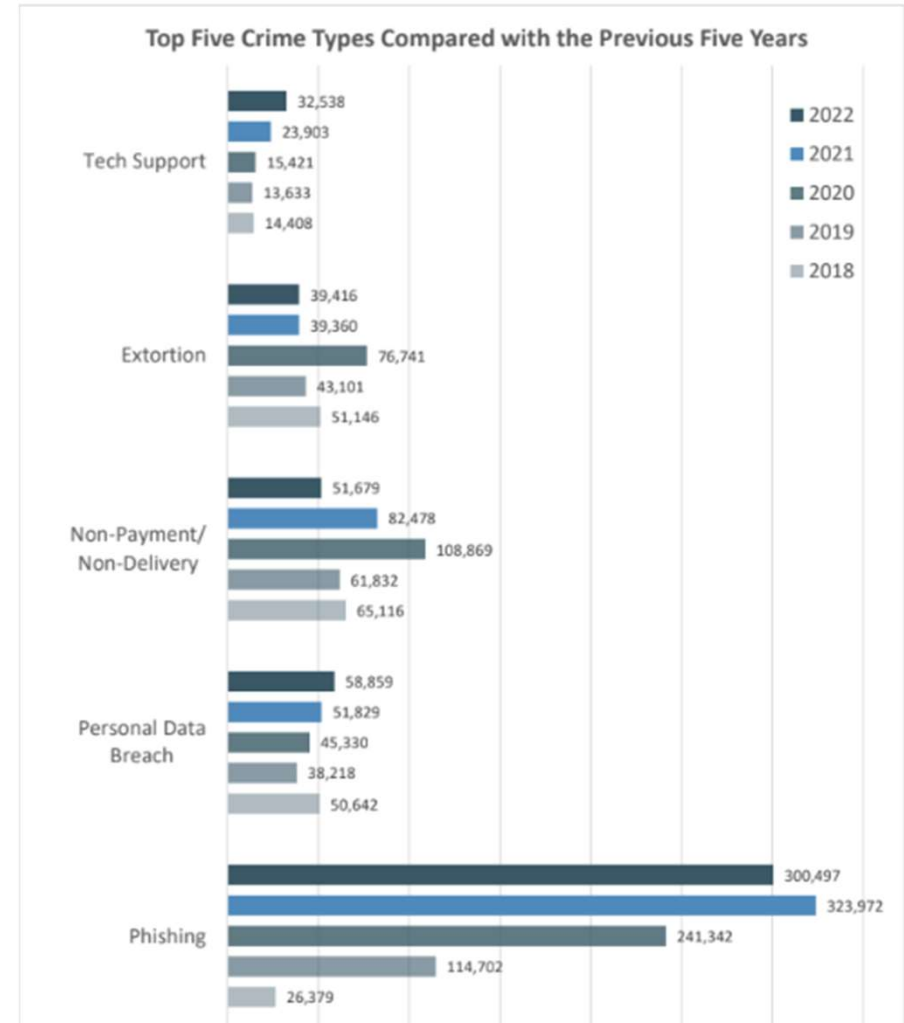Giovanni Russello

Why fewer "turned turtle" than 100 years ago?

a) Drivers are better trained
b) Cars are better designed

What is phishing

- Social engineering
- Through email
- Lures victims to perform an action
  - provide information
  - downloads
  - click links

Exponential Growth

Top Five Crime Types Compared with the Previous Five Years

Phishing cost US $20b in 2022

Expected to cost US $260b p.a. in 2032

◆ WSJ NEWS EXCLUSIVE | BUSINESS

JBS Paid $11 Million to Resolve Ransomware Attack

Meat supplier's U.S. chief says firm paid cybercriminals in bitcoin to avoid more disruptions

By Jacob Bunge
Updated June 9, 2021 8:27 pm ET

SAFETY 24-7

Photographer: Samuel Cor

Cybersecurity

Hackers Breached Colonial Pipeline Using Compromised Password

By William Turton and Kartikay Mehrotra

Why is phishing still a problem?

We have technical solutions

- Protect against hackers but don't apply to phishing
  - Encryption
  - Access Control

- Prevention
  - Filtering emails and links
  - Detecting intelligence gathering

- Real-time monitoring
  - Analysing processes for unusual activity
  - Anomaly detection

Cyber training mostly unsuccessful in preventing phishing – study

by Gabriel Olano
17 Jul 2021

SHARE

Traditional cyber defences are apparently not enough to prevent cyberattacks such as phishing, with 54% of all victims having anti-phishing training and 49% having perimeter defences in place at the time of attack, a global study by cloud storage firm Cloudian revealed.

The study called for organisations to place greater attention on putting systems in place that enable quick data recovery in the event of an attack, without paying ransom.

According to Cloudian, many organisations spend large portions of their cybersecurity budget on defensive
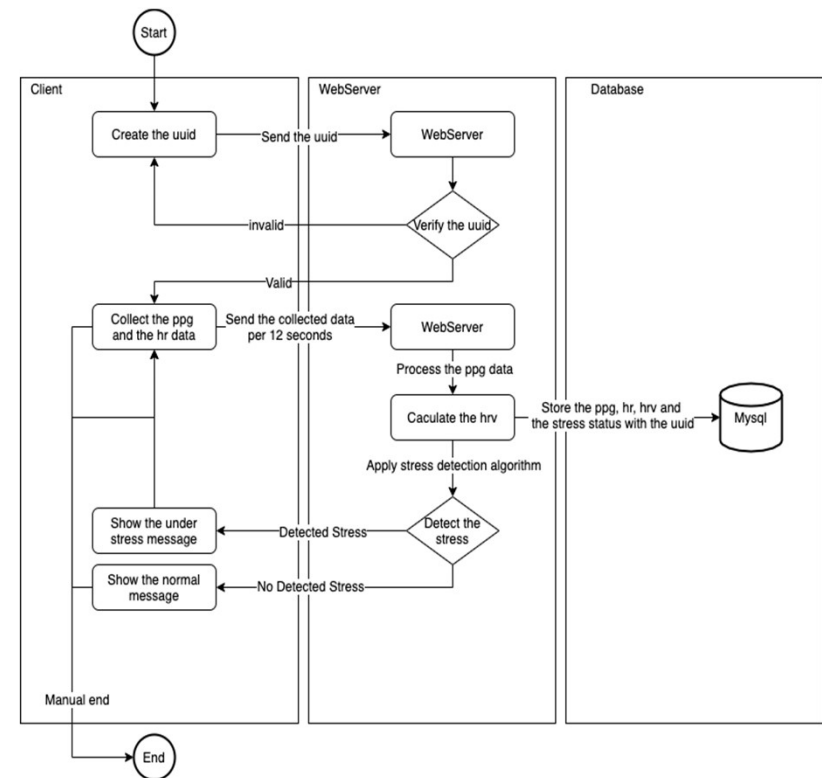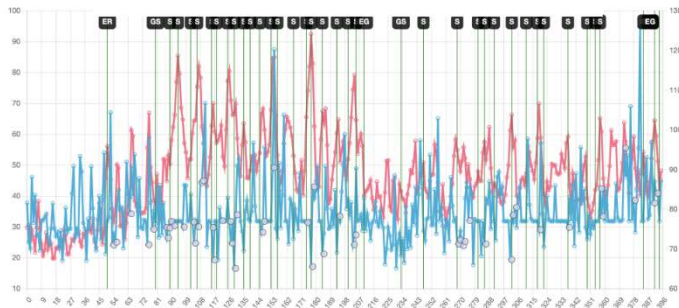
What makes people susceptible

TABLE II
SYSTEMIZATION OF CURRENT LITERATURE AND COVERAGE OF FACTORS AMONG THE STUDIES

Literature	Long term stable			Situational		In the moment			Quality (sample size)		
	Knowledge	Demographics	Personality and habits	Access method	Situational characteristics	Cognitive effort	Persuasion methods	Visual presentation	Phishing simultion	Email management	Survey only
Musuva et al. [12]	●	○	○		○	●	◐	●	L		
Parsons et al. [13]	◐	○	◐			●				M	
Wang et al. [14]	●	○	○			●			L		
Janet et al. [15]	●	○	○					○			S
Tjostheim and Waterworth [16]	○	○	●								L
Burda et al. [17]		●			○	○	●	◐	M		
Jalali et al. [18]	●	○		◐					L		
Wang et al. [19]	●	○				○	○			L	
Alseadoon et al. [20]	○	●				○				M	
Diaz et al. [21]	●	○				●				M	
Mohebzada et al. [22]	○	●				○				L	
House and Raja [23]	●	○					●			S	
Lin et al. [24]	◐	◐					●			M	
Taib et al. [25]	◐	◐					●			L	
Baillon et al. [26]	●	◐								L	
Manasrah et al. [27]	●	◐									M
Sarno et al. [28]	◐	●								M	
Sheng et al. [6]	●	●								L	
Vishwanath et al. [29]	◐		◐	◐		●	◐	◐			S
Petelka et al. [30]	○		○	◐		●		●		M	
Sarno and Neider [31]	◐		◐	●							S
Pfeffel et al. [32]	○		○			○		◐			S
Vishwanath et al. [33]	●		◐			●				M	
Williams and Polage [34]	○		○				●	●			S
Alseadoon et al. [35]	○		●					●		M	
Welk et al. [36]	◐		●								S
Gordon et al. [37]	◐				○		●		L		
Harrison et al. [38]	○					●	●	○	S		
Canfield et al. [39]	●					●					S
Jansen and Van [40]	◐					●					M
Molinaro and Bolton [41]	○					●				M	
Parsons et al. [42]	○						●	●		M	
Downs et al. [8]	●							○		M	
Canfield et al. [43]	●									L	
Perrault [44]	●									L	
Chuchuen and Chanvarasuth [45]		○	●					◐			M
Blythe et al. [46]		○		◐			●	●		M	
Sarno et al. [47]		●			○	◐		◐			S
Wright et al. [48]		○				○	●		S		
Goel et al. [49]		◐					●			M	
Lawson et al. [7]			●				●			M	
Curtis et al. [50]			●				●			L	
Harrison et al. [51]						●		●	S		
Tian and Jensen [52]							●		S		
Arduin [53]								●		M	

Biometrics can help us understand susceptibility

Workload Impact on Susceptibility

The Impact of Workload on Phishing Susceptibility: An Experiment. S Zhuo, R Biddle, L Betts, Nalin Arachchilage, YS Koh, D Lottridge, G Russello. Usec 2024.

Post hoc Analysis Findings

Relevance matters more under high workload

Under low workload higher risks to fall for more generic phishing emails

Ignoring under high workload does not mean people are safe from those risks

Higher physiological arousal during high workload

Concluding

Increased attack sophistication at scale through AI

Need for improving user studies

Need innovation to support people to mitigate risk

Fin