Human Centric Security

Putting a human spin on cyber

Dr Marthie Grobler

What is cyber?

- The origin of the word 'cyber' links to the Greek word κυβερνητική. What does this word mean?

  A. technology

  B. Internet

  C. pilot, steersman

  D. progress

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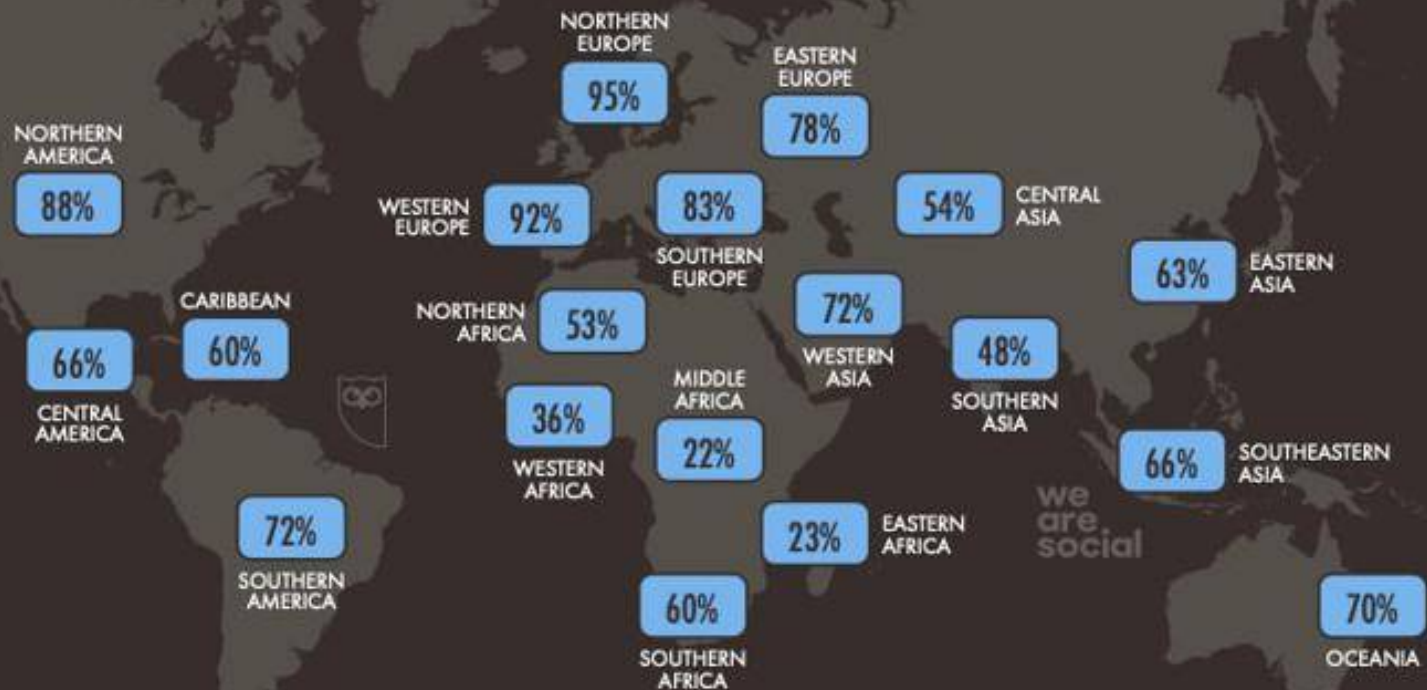C. pilot, steersman

JAN 2020

INTERNET PENETRATION BY REGION

NUMBER OF INTERNET USERS IN EACH REGION COMPARED TO TOTAL POPULATION*

- NORTHERN EUROPE — 95%
- EASTERN EUROPE — 78%
- NORTHERN AMERICA — 88%
- WESTERN EUROPE — 92%
- SOUTHERN EUROPE — 83%
- CENTRAL ASIA — 54%
- EASTERN ASIA — 63%
- CARIBBEAN — 60%
- CENTRAL AMERICA — 66%
- NORTHERN AFRICA — 53%
- WESTERN ASIA — 72%
- SOUTHERN ASIA — 48%
- WESTERN AFRICA — 36%
- MIDDLE AFRICA — 22%
- SOUTHEASTERN ASIA — 66%
- SOUTHERN AMERICA — 72%
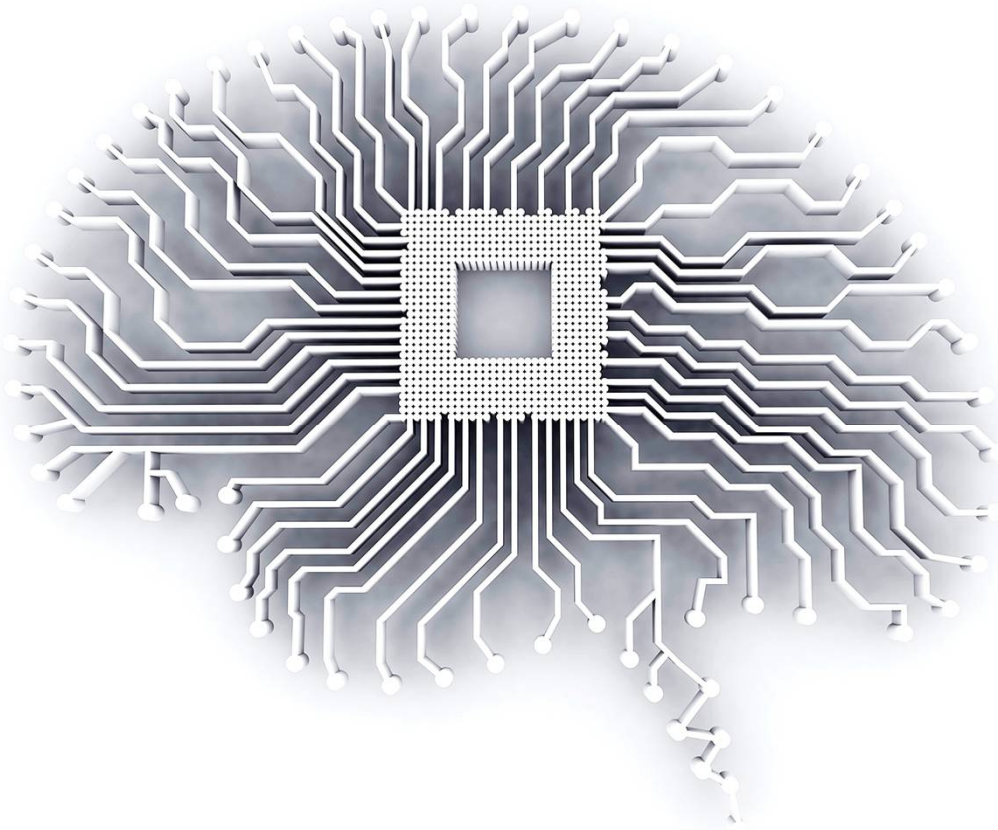- EASTERN AFRICA — 23%
- SOUTHERN AFRICA — 60%
- OCEANIA — 70%

9

we are social   Hootsuite

90% of data created after 2016

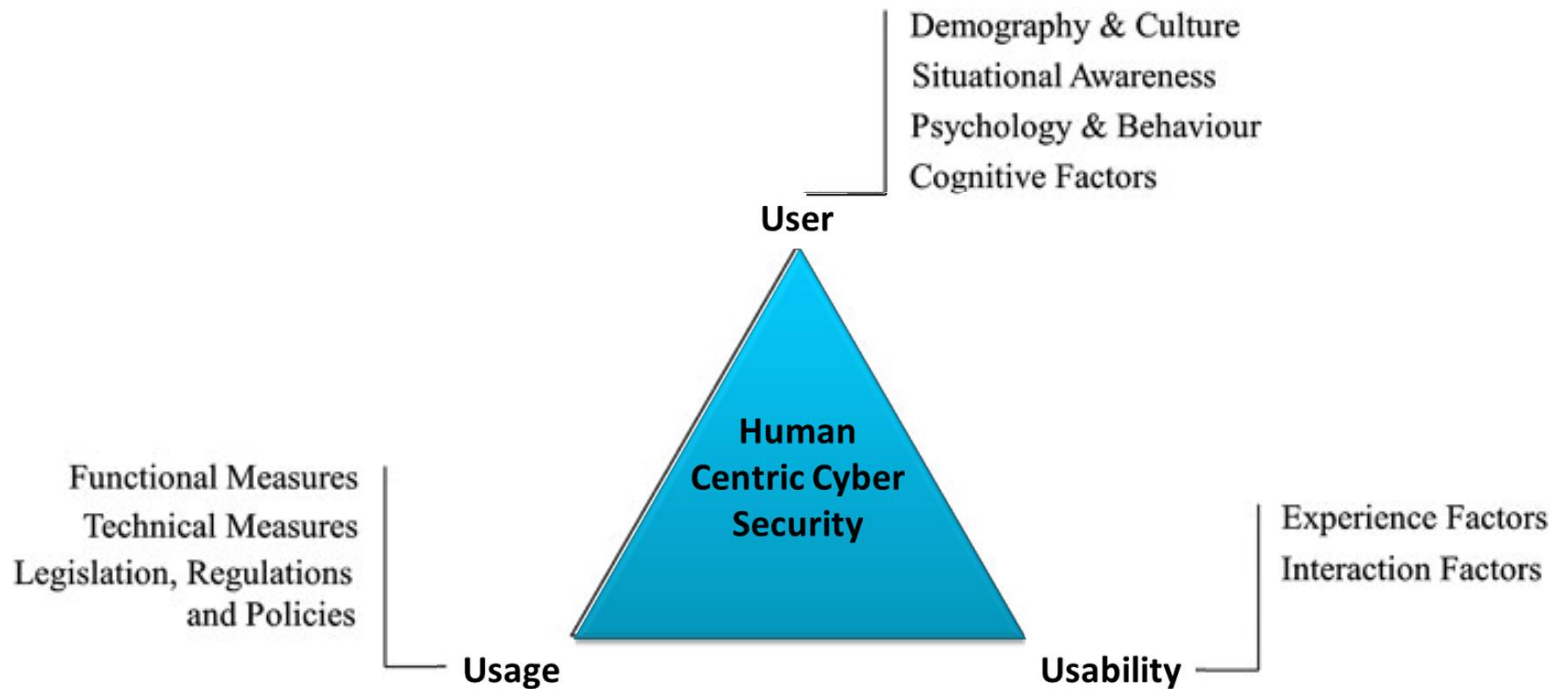**1.5 billion** Internet more today than in 2016

where the human
is **the creator,**
the user,
the point of
success and
the point of failure

Collaborative intelligence

Human Centric Security

User
- Demography & Culture
- Situational Awareness
- Psychology & Behaviour
- Cognitive Factors

Usage
- Functional Measures
- Technical Measures
- Legislation, Regulations and Policies

Usability
- Experience Factors
- Interaction Factors

Human Centric Cyber Security

Grobler MM, Gaire R & Nepal S. 2021. **User, Usage and Usability: Redefining Human Centric Cyber Security.** Cybersecurity and Privacy, Frontiers in Big Data. https://doi.org/10.3389/fdata.2021.583723

Usage

Social media analyser for cyber security intelligence

Cyber Security Insights from Real-time Twitter Analytics (CIRTA)

Social Media Intelligence (**SOCMINT**) tool that:

- Performs real-time filtering of cyber security related tweets
- Uses state-of-the-art NLP techniques to generate insights on current/trending cyber security events
- Provides real-time cyber security situational awareness
- Provides decision-making/ interpretation support relating to security aspects of digital, technology and cyber
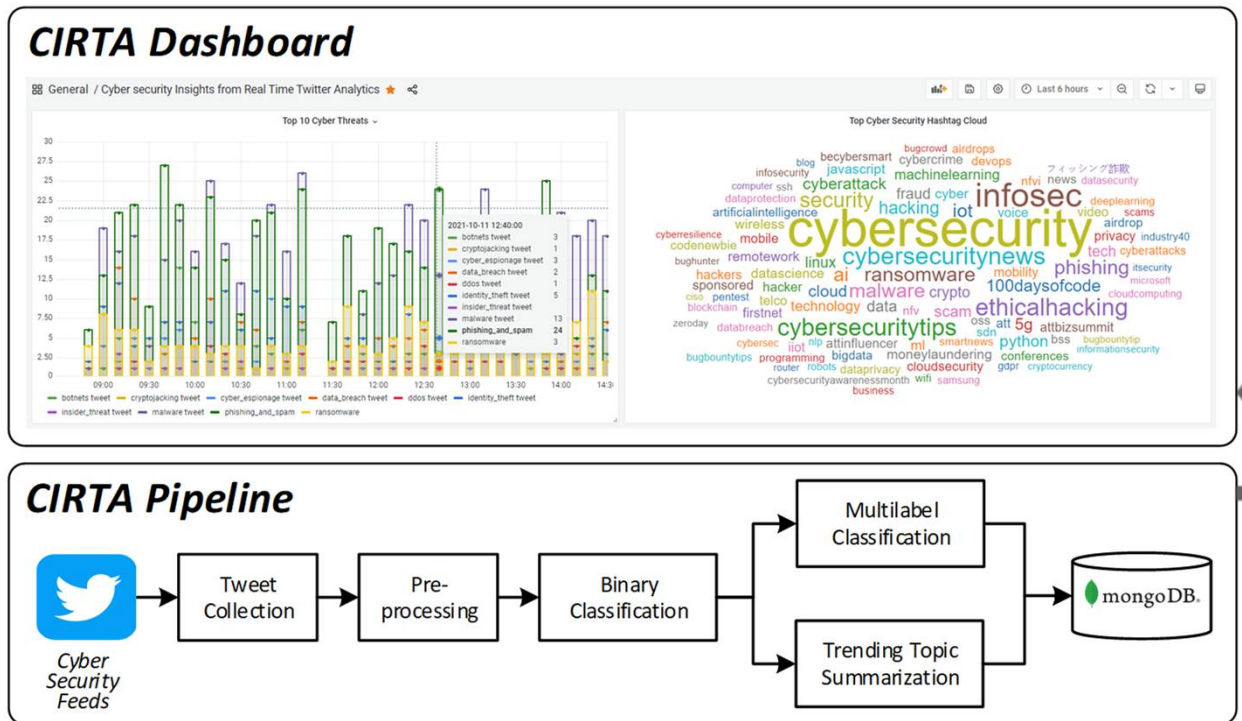
For more information: Mohan Baruwal Chhetri (mohan.baruwalchhetri@data61.csiro.au)
Team: Human Centric Security

Cyber security resilience and hardening

Develop a cybersecurity governance strategic roadmap

LEGEND: LOW - 1, INTERMEDIATE - 2, HIGH - 3, VERY HIGH – 4

METRIC SCORE	DATA BREACH	DOS RELATED	MALICIOUS EXPLOITS	PASSWORD RELATED	PHISHING	REMOTE ACCESS	REMOVABLE MEDIA RELATED	SPAMMING	WEB SEEDING	WIRELESS CONNECTIVITY RELATED	Summed impact	Mean impact level
Services and/or facilities	1	3	4	3	1	2	4	2	1	1	22	2
Severity, intensity or magnitude	4	3	4	3	2	3	3	4	4	4	34	3
Scope or spatial distribution	4	4	4	4	3	4	4	4	4	2	37	4
Effects of time or temporal distribution	4	4	4	4	3	4	4	4	4	4	39	4
Public effect	2	2	3	3	4	1	1	1	2	2	21	1
Economic effect	4	4	3	3	3	4	4	4	3	3	35	3
Environmental effect	1	3	3	1	1	1	2	1	1	1	15	1
Political effect	2	1	3	2	1	3	3	3	2	2	22	2
Public safety	1	3	3	3	1	2	3	1	1	1	19	2
Interdependency	4	4	4	4	4	4	4	4	4	4	40	4
Contribution	4	4	4	4	4	4	4	4	4	4	40	4
Summed criticality	31	35	39	34	27	32	36	32	32	28		
Mean criticality level	3	3	4	3	3	3	3	3	3	3		

For more information: Marthie Grobler (marthie.grobler@data61.csiro.au)
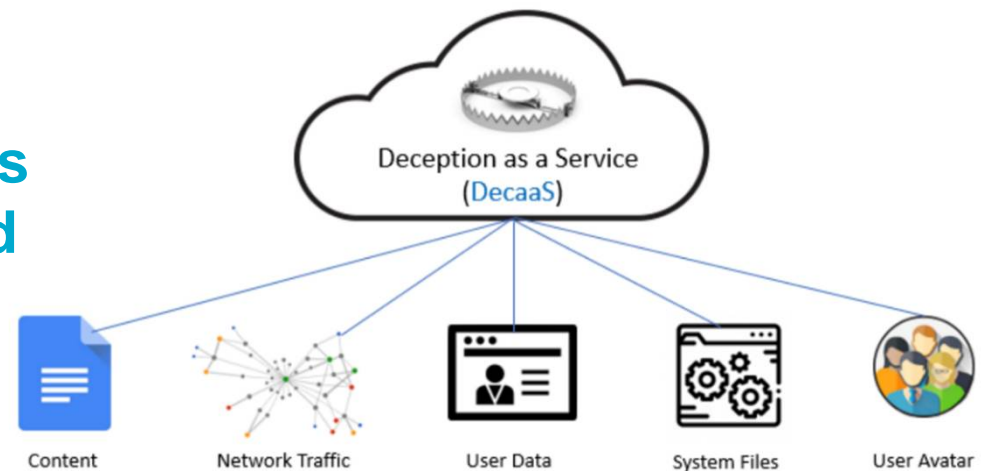*Team: Human Centric Security*

Machine learning enabled cyber deception

- Using ML to automate the creation of *realistic* honeypots
- Metrics for evaluating deceptions
- Using ML to simulate attackers and how they interact with deceptions

Building strong cyber defences with machine learning enabled cyber deception

Deception as a Service (DecaaS)

Content   Network Traffic   User Data   System Files   User Avatar

For more information: Kristen Moore (*Kristen.Moore@data61.csiro.au*)
Team: Human Centric Security

User

Crime and corruption in the 4th industrial revolution

March 2017 | EXPERT BRIEFING | FRAUD & CORRUPTION

financierworldwide.com

ID10T Error!
An ID10T error has occured.
Location: Between keyboard and chair.
You must eliminate the problem before proceeding further.
OK

Abbreviation Finder

PEBCAK

«««««««««««««« = »»»»»»»»»»»»»»

Problem Exists Between Chair and Keyboard

www.abbreviationfinder.org

BUSINESS INSIDER | Business Insider

A password for the Hawaii emergency agency was hiding in a public photo, written on a Post-it note

Kif Leswing
17 January 2018

hawaii 1

Twitter confirms phone spear-phishing attack behind high-profile bitcoin scam

Twitter's latest update through its security account notes that it was a phone spear-phishing attack that led to the bitcoin scam.

Yasmin Ahmed
New Delhi
July 31, 2020 UPDATED: July 31, 2020 17:43 IST

Home » Cybersecurity » Cyberlaw » Half of Internet Users Fall Victim to Cyber Attacks

Half of Internet Users Fall Victim to Cyber Attacks

by Alina Bizga on June 29, 2020

Upskilling executive decision making

AICD, Data61 Launch Cyber Security Course For Directors

Tess Bennett / November 7, 2017

http://aicd.companydirectors.com.au/education/courses-for-the-director/short-courses/cyber-for-directors

Executive Education Platform

CRCounter

News   Training Centre   Practice Arena   Ask an expert   About Us   Profile ▾

About CRCounter
CRCounter is a lightweight cyber training platform for top-level management.

Our Aim
Improve the executives' general attitude towards institutional cyber hygiene by equipping them with the required knowledge in order to enhance their confidence in term of making informed decisions on the organisation cyber security status.

How it works?

Training — Start with the training modules

Practice — Practice your skills with 5-minutes challenges

Ask for Professional Help — Receive the feedback from the professional and ask questions

About Us - DSS Group (Data61)
The Distributed Systems Security (DSS) group's research focus is on developing platform technologies with the purpose of increasing trust and confidence in modern distributed systems and data generated by those systems, specifically in the areas of Internet-of-Things (IoT) security and autonomic cyber systems. These areas are supported by the overarching cybersecurity governance, policies and awareness focus.

For more information: *Marthie Grobler (marthie.grobler@data61.csiro.au)*
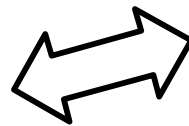*Team: Human Centric Security*

National cyber security maturity

Does certain cultural dimensions lead to ...
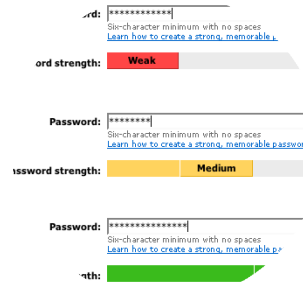
Key indicator is the strength of the login details used to authenticate a user for a particular system

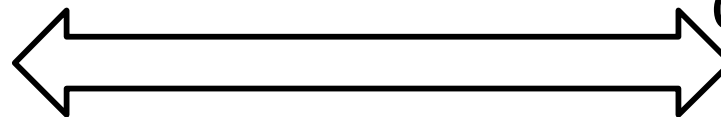**Riskier cyber security behaviour on a national level**

Login strength

National culture ⟷ **Cyber security maturity**

For more information: Marthie Grobler (marthie.grobler@data61.csiro.au)
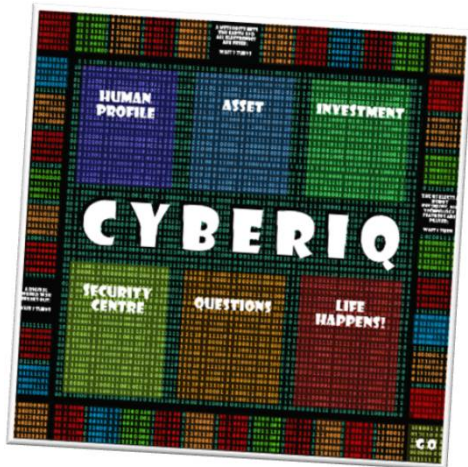*Team: Human Centric Security*

Cyber gamification

Computer based arcade style game

Immersive cyber security escape game

Table top executive focused cyber security game
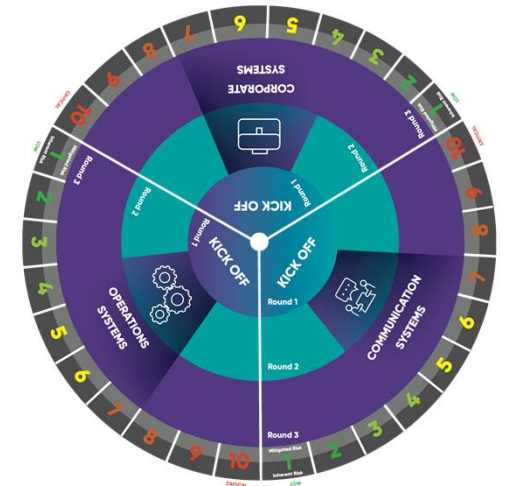
Beta mobile version

Table top event based cyber security game

For more information: Marthie Grobler (marthie.grobler@data61.csiro.au)
Team: Human Centric Security

Usability

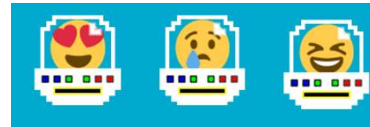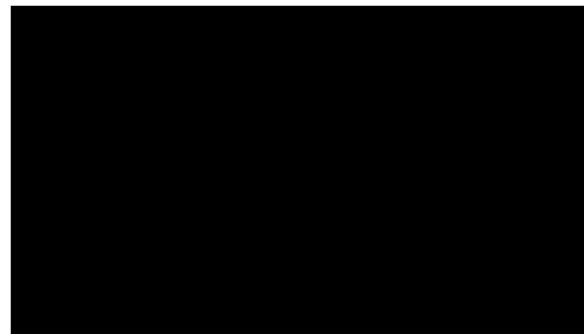**Designed**
for humans,
by humans,
and *secured*
by humans

Bad cyber security behaviour

https://i.ytimg.com/vi/osw8Qxz55kE/maxresdefault.jpg
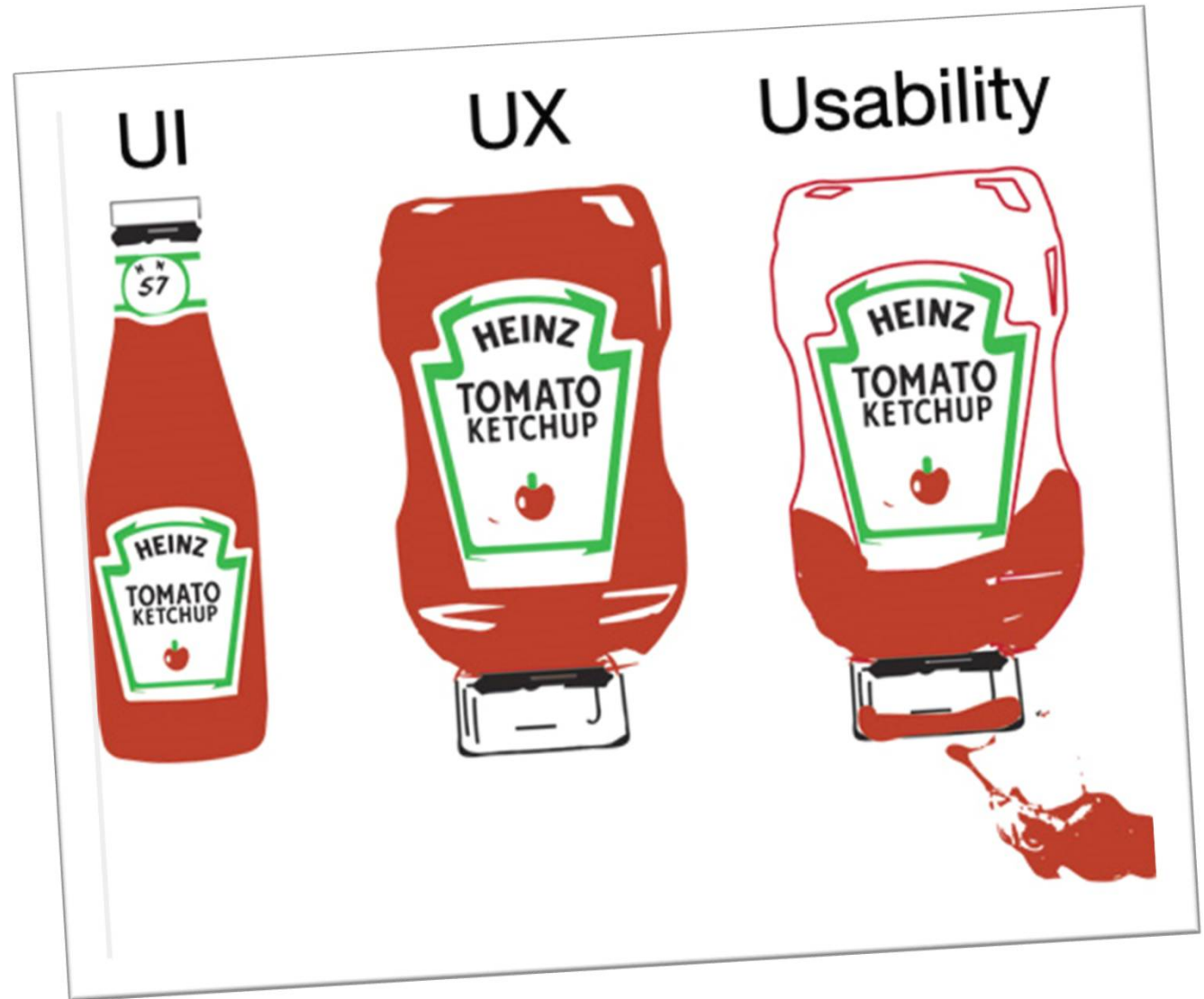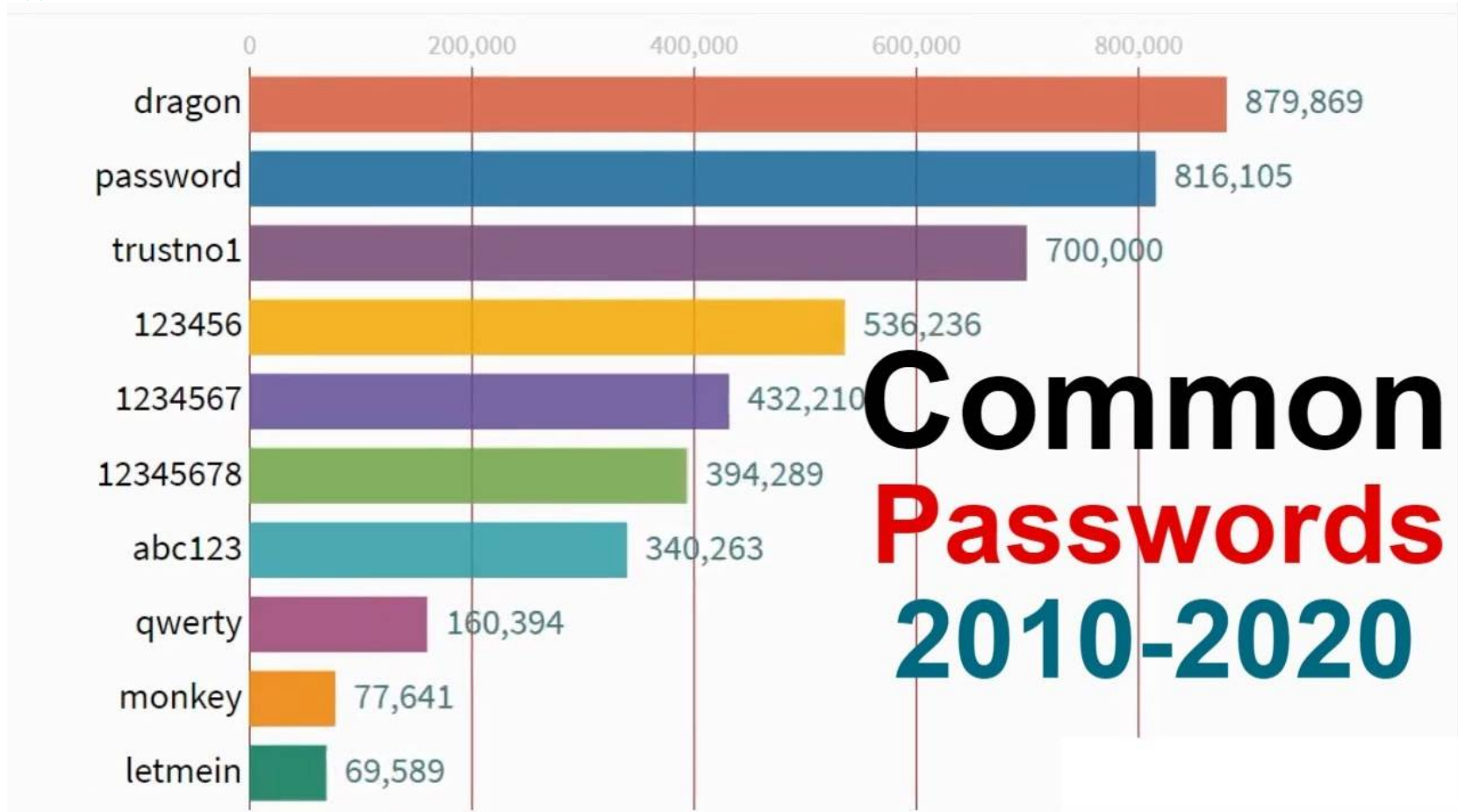
Phishing resilience

Count plot representing the indicators used by participants to determine if a website is safe

For more information: Marthie Grobler (marthie.grobler@data61.csiro.au)
Team: Human Centric Security

Phishing susceptibility via file sharing
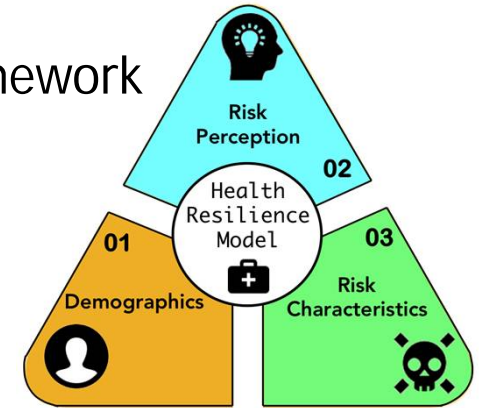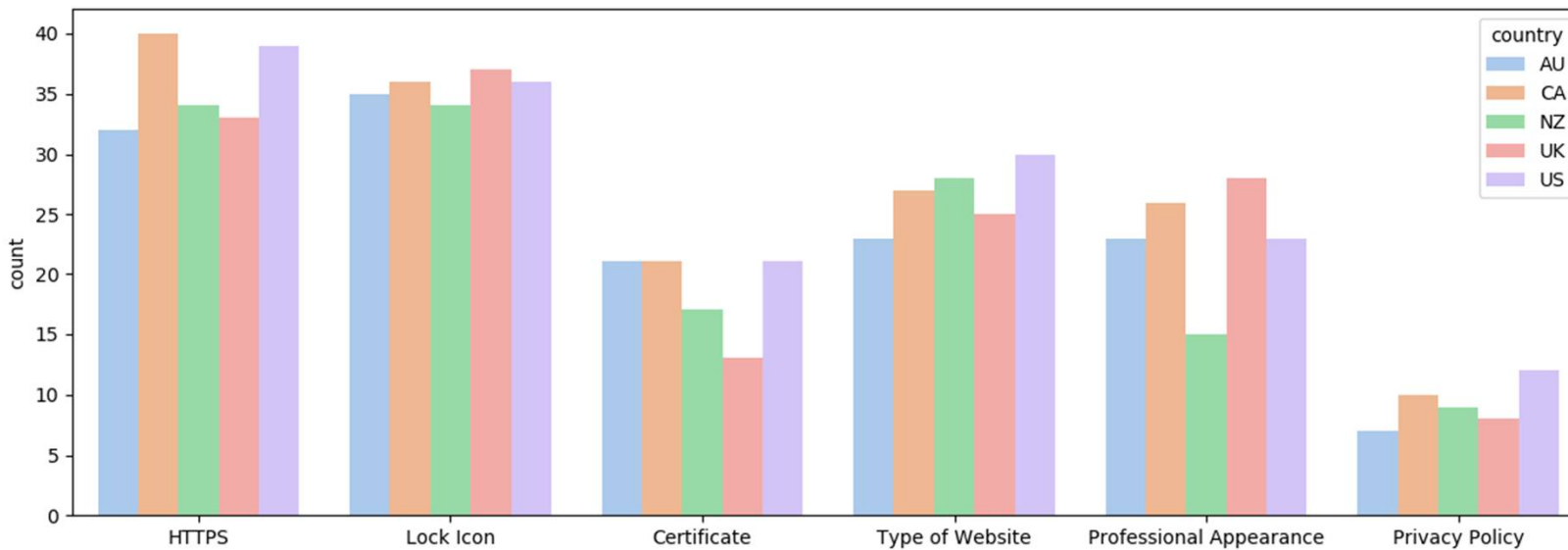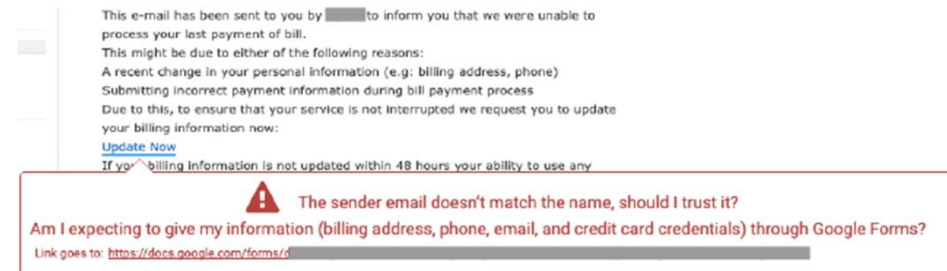
- File-sharing attacks: A new brand impersonation attack
  - 70% of file-sharing links were not reported by existing methods
  - Users remain responsible to make the ultimate decision
- What we did
  - An online experiment (N=406) to learn how human centric explanations impact susceptibility

Our dynamic phishing warnings reduce users' susceptibility for file sharing attacks by 77.8%

This e-mail has been sent to you by ▮▮▮ to inform you that we were unable to process your last payment of bill.
This might be due to either of the following reasons:
A recent change in your personal information (e.g: billing address, phone)
Submitting incorrect payment information during bill payment process
Due to this, to ensure that your service is not interrupted we request you to update your billing information now:
Update Now
If your billing information is not updated within 48 hours your ability to use any

⚠ FAKE WEBSITE, DON'T CLICK!

Link goes to: https://docs.google.com/for▮

Static phishing warning

This e-mail has been sent to you by ▮▮▮ to inform you that we were unable to process your last payment of bill.
This might be due to either of the following reasons:
A recent change in your personal information (e.g: billing address, phone)
Submitting incorrect payment information during bill payment process
Due to this, to ensure that your service is not interrupted we request you to update your billing information now:
Update Now
If your billing information is not updated within 48 hours your ability to use any

⚠ The sender email doesn't match the name, should I trust it?
Am I expecting to give my information (billing address, phone, email, and credit card credentials) through Google Forms?
Link goes to: https://docs.google.com/forms/d▮

Dynamic phishing warning (ours)

For more information: Tina Wu (Tina.Wu@data61.csiro.au)
Team: Human Centric Security

Australian Cyber Security Index for mHealth Apps (ACSIMA)

A multi-stakeholder user study to generate a curated cyber security checklist that can guide the design and development of mHealth apps and be used to assess existing apps
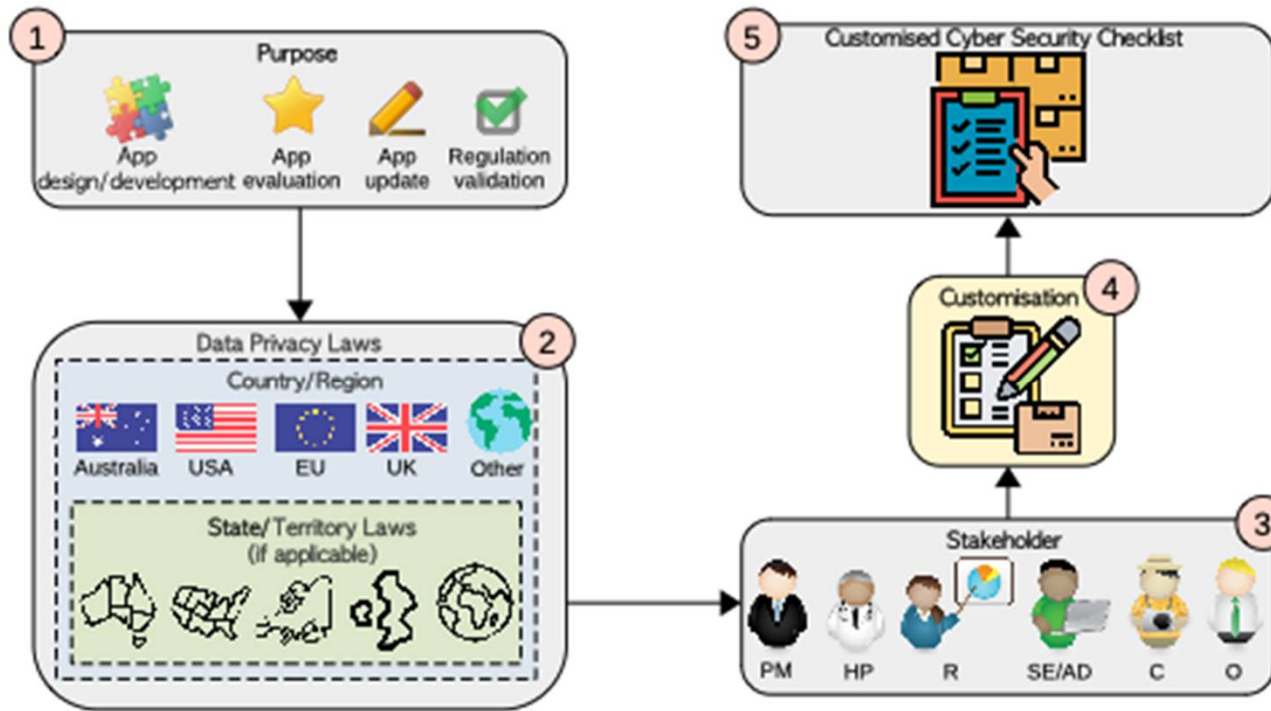
Distribution of the Assumption that Cyber Security is Built into mHealth apps among the participants in the user study for ACSIMA.
PM: Policy Makers
HP: Health Professionals
SE/AD: Software Engineers/App Developers
C: Consumers
O: Other
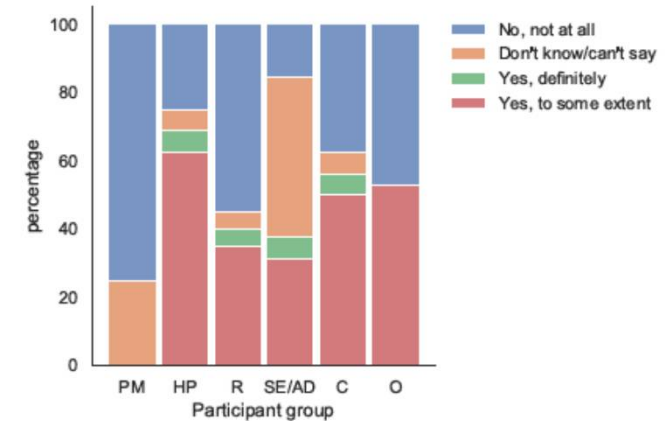
For more information: Hamza Sellak (Hamza.Sellak@data61.csiro.au), Marthie Grobler (marthie.grobler@data61.csiro.au)

Team: Human Centric Security
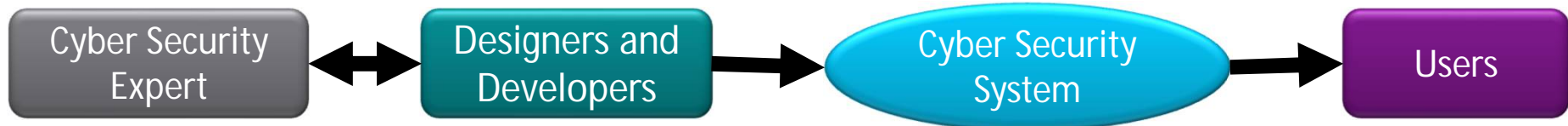
Cyber security uplift

- six SMEs based in South Australia
- targeted consultations
- high-level assessment of the cyber security posture of SMEs and to provide recommendations to improve overall cyber security maturity

The pilot learnings are analysed and formulated into an analysis report and blueprint that will help inform Government in any future implementation of a scalable, state-wide cyber security for SMEs initiative

For more information: Marthie Grobler (marthie.grobler@data61.csiro.au)
Team: Human Centric Security

Human centric security

Traditional view of human centric cyber security — one-size-fits-all systems

Cyber Security Expert ↔ Designers and Developers → Cyber Security System → Users

Paradigm shift in human centric cyber security — customisable tailored systems
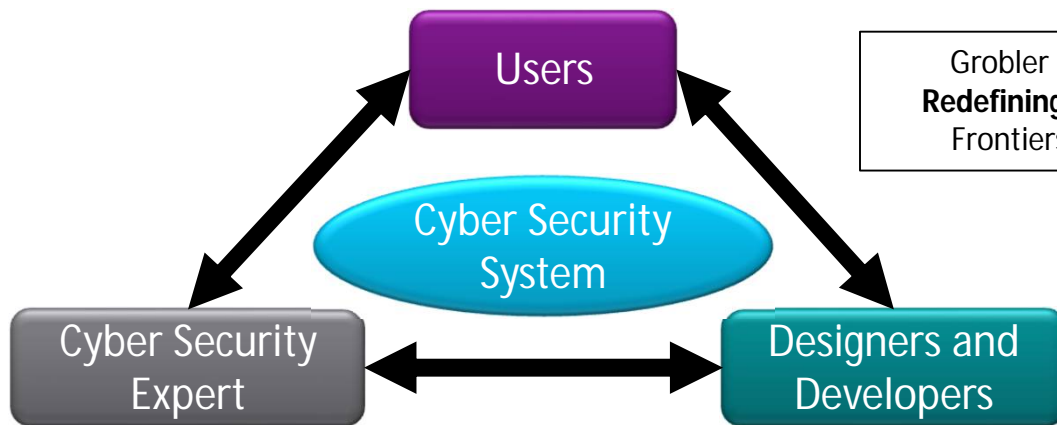
Users

Cyber Security System

Cyber Security Expert ↔ Designers and Developers

Grobler MM, Gaire R & Nepal S. 2021. **User, Usage and Usability: Redefining Human Centric Cyber Security.** Cybersecurity and Privacy, Frontiers in Big Data. https://doi.org/10.3389/fdata.2021.583723

Want more?

(f) (twitter) (instagram) (in) (rss)

Thank you

- Data61
  - Dr Marthie Grobler
  - Team Leader: Human Centric Security
  - Principal Research Scientist

0395 185 953

marthie.grobler@data61.csiro.au