

Modern Approaches for Digital Evidence Collection (OSINT & EWT)

**Nigeria Computer Society
Cybersecurity Forum & Workshop**

**Dr. Muktar Bello
25th June, 2025**



BACKGROUND

EDUCATION

- **B.Tech** (Network Security)
- **MSc** (Forensic Computing)
- **PhD** (Cybersecurity & Cybercrime Investigation)

EXPERIENCE

- Telecommunications
- Information Technology
- **Law Enforcement**



SPECIALIZATION

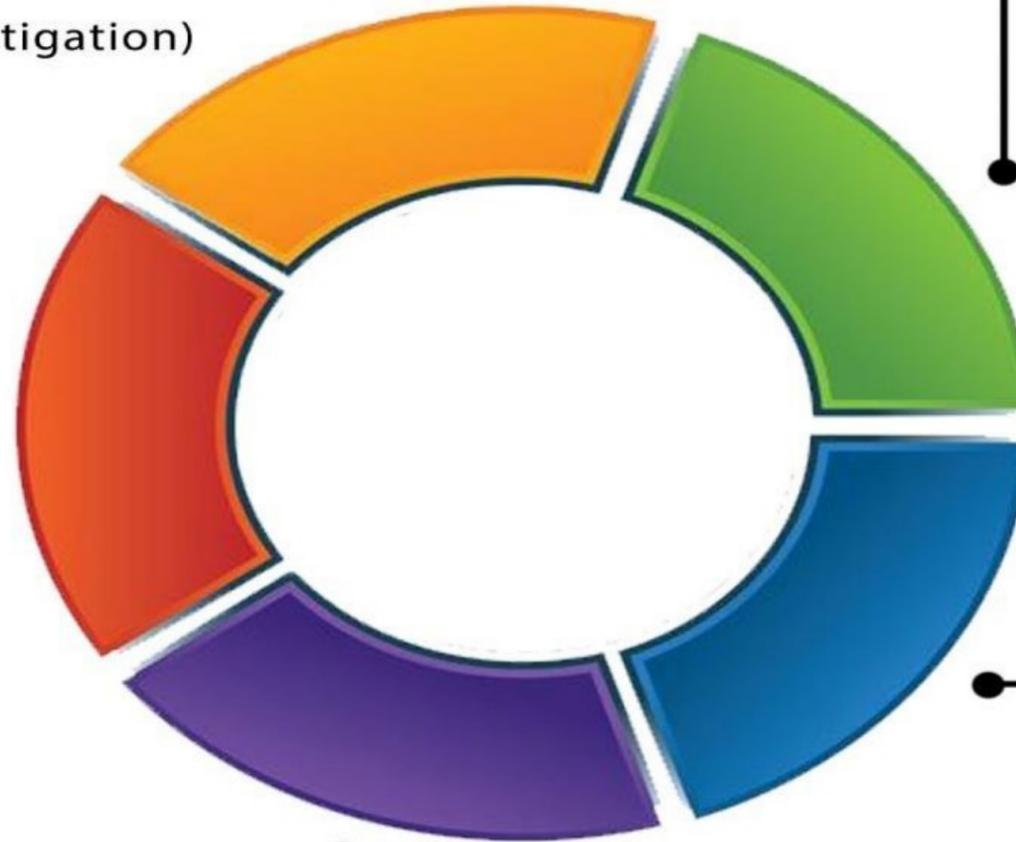
- Mobile Forensics
- Network Security
- CCTV Investigation
- Critical Infrastructure Protection (CIP)
- Cybercrime Investigation

INTERESTS

- Mobile Forensics
- Cybercrime
- Information Systems
- Cell Site Analysis
- Legal Aspects of Computing

EXPERT WITNESS

- Federal High Court
- Military Court Martial
- Investigative Panel



AFFILIATIONS

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



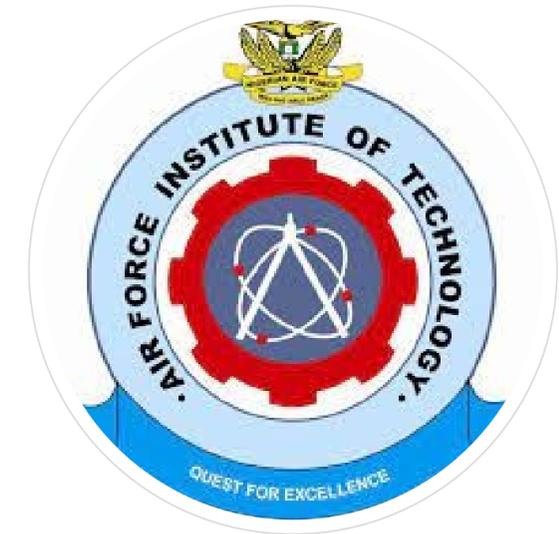
LAW ENFORCEMENT



LECTURER & RESEARCHER



EXPERT FORENSIC CONSULTANT



VISITING LECTURER



RESOURCE PERSON



ACADEMIC ADVISORY MEMBER



SUBJECT MATTER EXPERT



ISO 27001 SENIOR LEAD IMPLEMENTER

RESOURCE PERSONS

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

CYBER SECURE NIGERIA CONFERENCE 2022

THEME
CYBERSECURITY
AN IMPERATIVE FOR TACKLING SECURITY CHALLENGES IN NIGERIA.

June 21 - 22 9am Daily
CBN International Training Institute, Maitama, Abuja



SPEAKER
Dr. Muktar Bello
Head of Quality Control and Assurance (EFCC).

SPONSORS: BANK OF INDUSTRY, dafreco, ESET, fezzant, HACKTALES, Lynsec

social media handles: @cyberexpertsng, @csean, linkedin.com/company/csean, csean.org.ng

I AM SPEAKING AT

CyFrica HYBRID EVENT
28 JUN 29 2022
The Kenyatta International Convention Centre (KICC) Nairobi, Kenya



DR. MUKTAR BELLO
Head of Quality Control and Assurance
Economic and Financial Crimes Commission

Organised by **TRAGEPASS**

EVENT BY **ibento**

CYBERX AFRICA
31st March - 1st April 2022
10 AM to 2 PM
South Africa time (GMT +2)

**FUTURISTIC PANEL DISCUSSION
CYBERSECURITY TRENDS
Where Is The Industry Heading
In An Uncertain 2022**

PANELISTS:

- HARRISON NNAJI** CISO, First Bank of Nigeria
- STEVE UMA** CIO & Head, Information Services and Technology, NSIA Insurance Pvt Ltd
- FAHEEM ALI** Chief Risk Officer, Musoni Microfinance
- DR. MUKTAR BELLO** Head, Quality Control and Assurance Section, Economic and Financial Crimes Commission Forensics and Crime Laboratory Services Directorate, Nigeria

www.cyberxfricacyberxglobal.com

Collaborative TEACHING TEAM



BY **DR MUKHTAR BELLO**
Head of Quality Control & Assurance Section, Forensic & Crime Lab Services Directorate, Economic & Financial Crimes Commission, Institution & Research Cadastral, Nigeria

Meeting no : 2519 219 1010
Password : V5mSFvbNr88

SESSION 4
TOPIC : "THE ROLE OF FORENSIC SCIENCE IN THE INVESTIGATION OF CYBERCRIME"
DATE : 11 JANUARY 2023
TIME : 5.00PM - 6.30PM (MYT)

IMS605 DATA CENTER OPERATIONAL AND SERVICES
BACHELOR OF INFORMATION SCIENCE (HONS) INFORMATION SYSTEMS MANAGEMENT (IM245)

UITM PUNCAK PERDANA & UITM MACHANG

CYBER SECURITY CHALLENGE NIGERIA



MEET OUR SPEAKER
Dr Muktar Bello
Head, Quality Control & Assurance Section, EFCC Forensics & Crime Laboratory Services Directorate

Technical Presenter

Baze University 25th- 26th May, 2022 www.cysec.ng

CSEAN CYBER SECURITY EXPERTS ASSOCIATION OF NIGERIA #CySecMeetUp

CYBER SECURITY MEET-UP
INSIDER THREATS

SATURDAY, 13TH JULY 2019 | 12 Noon
VENTURES PARK, 29 MANBILLA STREET OFF ASO DRIVE, ASOKORO, ABUJA

FEATURED PANELISTS >>>

- DR. MUKTAR BELLO** Head, Quality Control and Assurance Forensics Department, EFCC
- CHIDOMA ILEAGU** Head, IT Security & Audit Techies International Limited
- GLORY IDEHEN** President ISACA Abuja Chapter
- SIMBIAT OZIOMA SADIQ** Cyber Analyst CyberDome
- JOHN O. ODUMESI** Cybersecurity Analyst ONSA

REGISTER: csmabj0619.eventbrite.co.uk

social media handles: @CyberExpertsNigeria, @cyberexpertsng, @cyberexperts.ng, abuja@csean.org.ng, www.csean.org.ng

CYSEC NG 2022 National Hackathon & Cybersecurity Conference 5th Edition

Executive Speakers



Theme:
Emerging Cyberthreats: Landscape and Defense

SPONSORS: EC-Council, Pentester.Lat, DIGIVATION, MTN, UPGRADED ERA, ITREALMS, CENTRAL BANK SULLHMAN, Entrey

Baze University 25th- 26th May, 2022 www.cysec.ng

CyberSecurity Webinar is here!

Impact of Ukraine and Russia's War on Cyberspace



Dr. Muktar Bello
Head, Quality Control and Assurance, Forensics Dept., EFCC



Harrison Nnaji
Chief Information Security Officer, First Bank of Nigeria Ltd.



Shola Akinnukawe
Head, Electronic Business & Operations Control, First Bank of Nigeria Ltd.

27 April 2022 1pm (West Central Africa) Zoom

Contact us: 014485500, 07080625000 | firstcontact@firstbanknigeria.com; complaints@firstbanknigeria.com

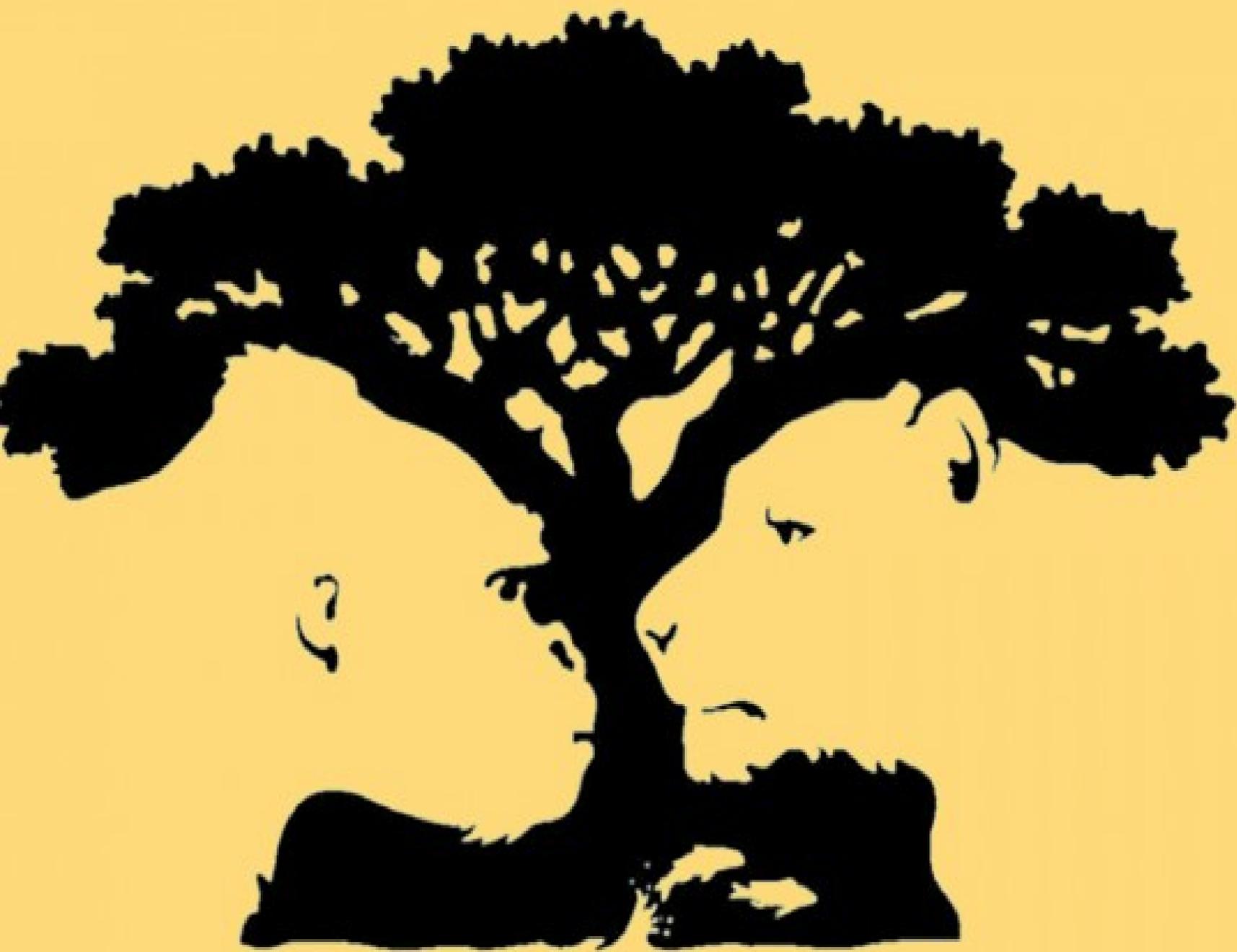
1N73LL1G3NC3

15 7H3

4B1L17Y

70 4D4P7 70

CH4NG3...



WHAT DID YOU SEE FIRST?

1. TREE

2. GORILLA

3. LION

4. FISH

**7H15 M3554G3
53RV35 70 PR0V3
HOW OUR M1ND5 C4N
DO 4M4Z1NG 7H1NG5!
1MPR3551V3 7H1NG5!
1N 7H3 B3G1NN1NG
17 W45 H4RD BU7
YOUR M1ND 15
R34D1NG 17
4U70M471C4LLY
W17H 0U7 3V3N
7H1NK1NG 4B0U7 17,
45 0NLY C3R741N P30PL3
C4N R34D 7H15
(- :...B3 PROUD ...:-)**

SCOPE & DISCLAIMER

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

GLOBAL
Digital Eco-System

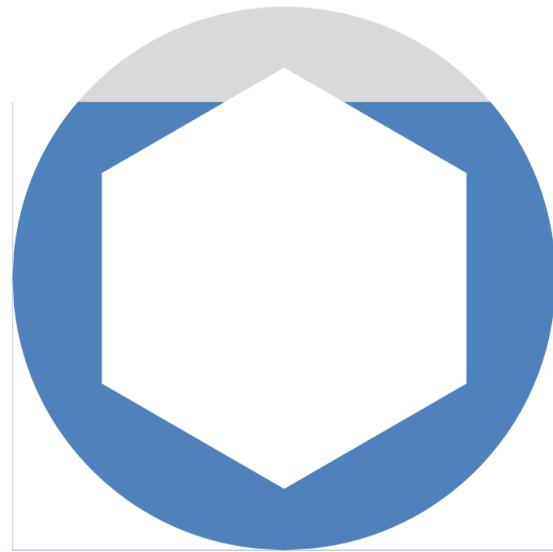
REGIONAL & NATIONAL

DISCLAIMER
My Views Only.



STATISTICS

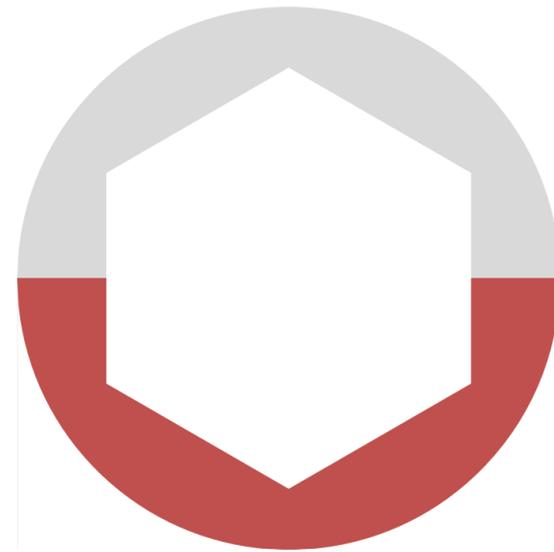
OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



\$23 Trillion

COST OF CYBERCRIME

Cybercrime would cost the world \$23 Trillion in 2027 (IMF 2024)



50%

GEN AI RISK

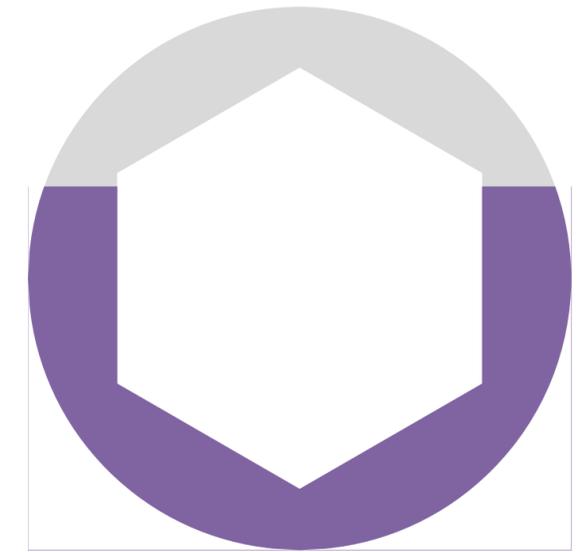
50% of Executive believe Gen AI will advance adversarial capabilities such as deep fake, malware & phishing (Sentinel One, 2024)



85 Million

SHORTAGE OF CYBER

There was a shortage of 4 million cybersecurity professionals which could increase to 85 Million in 2023 (Sentinel One, 2024)

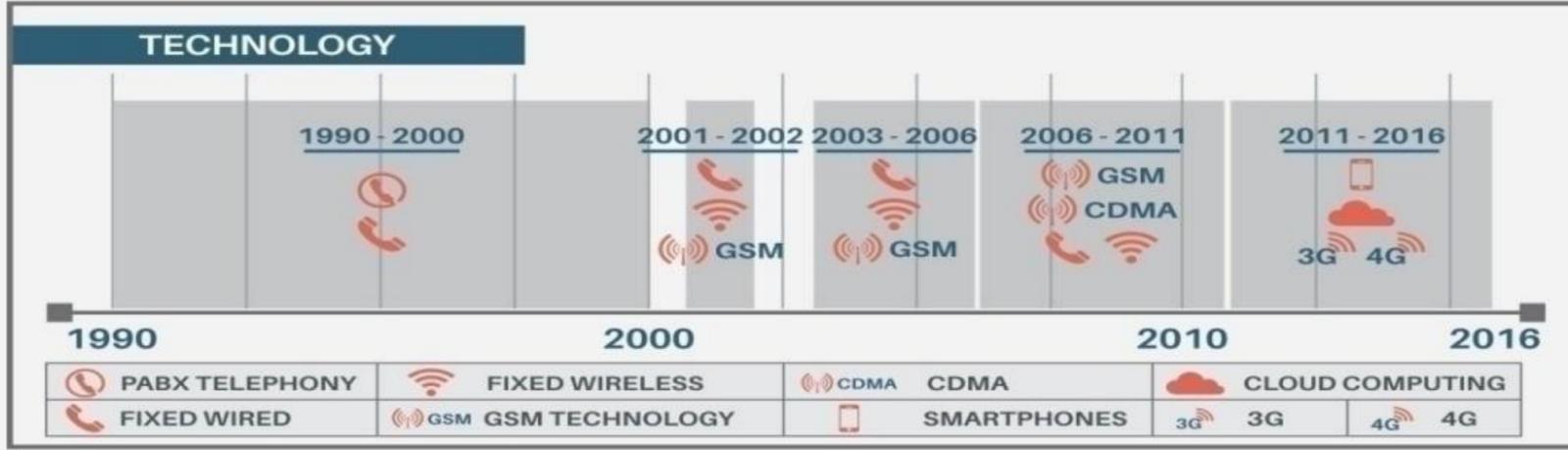
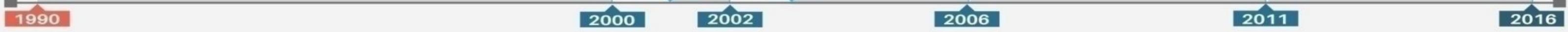


1,265%

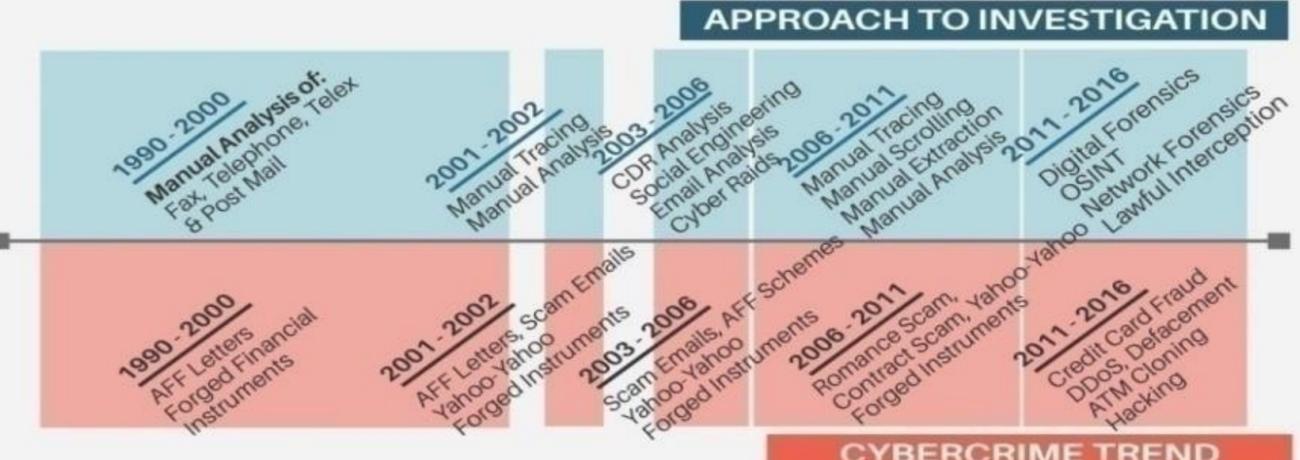
GEN AI PHISHING ATTACK

Phishing attacks increased by 1,265% driven by growth of Gen AI (Sentinel One, 2004)

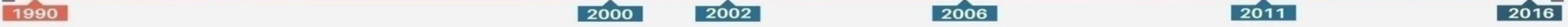
CYBERCRIME INVESTIGATION TIMELINE (1990-2016): NIGERIA



INVESTIGATION	CONVICTIONS	FINANCIAL LOSS (\$)
NA	NA	NA
93 Cases (2013) 147 Cases (2014)	-	\$ 13 Billion (2012)

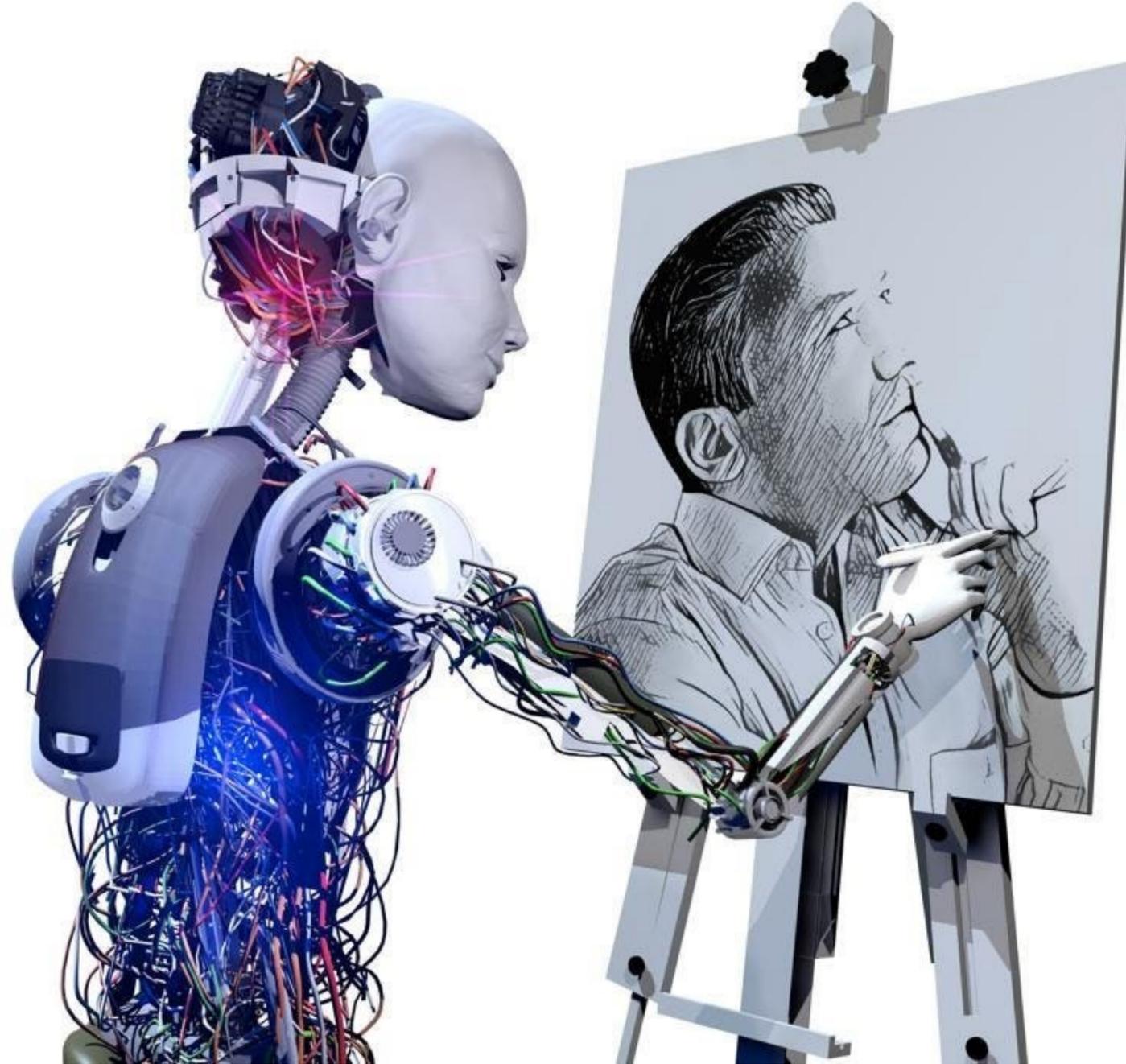


CHALLENGES



WHAT DO YOU SEE?

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11

FEB
2025

GLOBAL DIGITAL HEADLINES

OVERVIEW OF THE ADOPTION AND USE OF CONNECTED DEVICES AND SERVICES

NOTE: SIGNIFICANT REVISIONS TO SOURCE DATA MEAN THAT FIGURES SHOWN HERE ARE **NOT COMPARABLE** WITH PREVIOUS REPORTS. SEE THE IMPORTANT NOTES AT THE START OF THIS REPORT FOR DETAILS.



GLOBAL OVERVIEW

TOTAL
POPULATION



we
are
social

8.20
BILLION

YEAR-ON-YEAR CHANGE

+0.9%
+70 MILLION

URBANISATION

58.1%

CELLULAR MOBILE
CONNECTIONS



Meltwater

8.78
BILLION

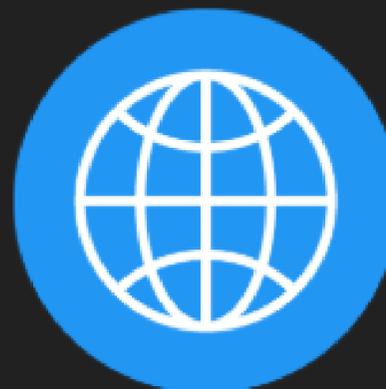
YEAR-ON-YEAR CHANGE

+2.2%
+190 MILLION

TOTAL vs. POPULATION

107%

INDIVIDUALS USING
THE INTERNET



5.56
BILLION

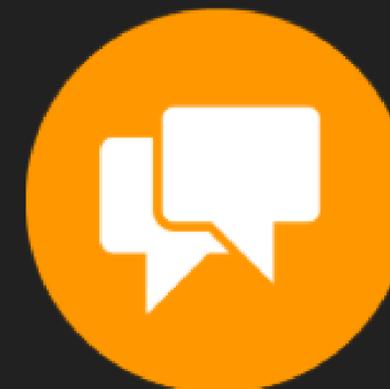
YEAR-ON-YEAR CHANGE

+2.5%
+136 MILLION

TOTAL vs. POPULATION

67.9%

SOCIAL MEDIA
USER IDENTITIES



5.24
BILLION

YEAR-ON-YEAR CHANGE

+4.1%
+206 MILLION

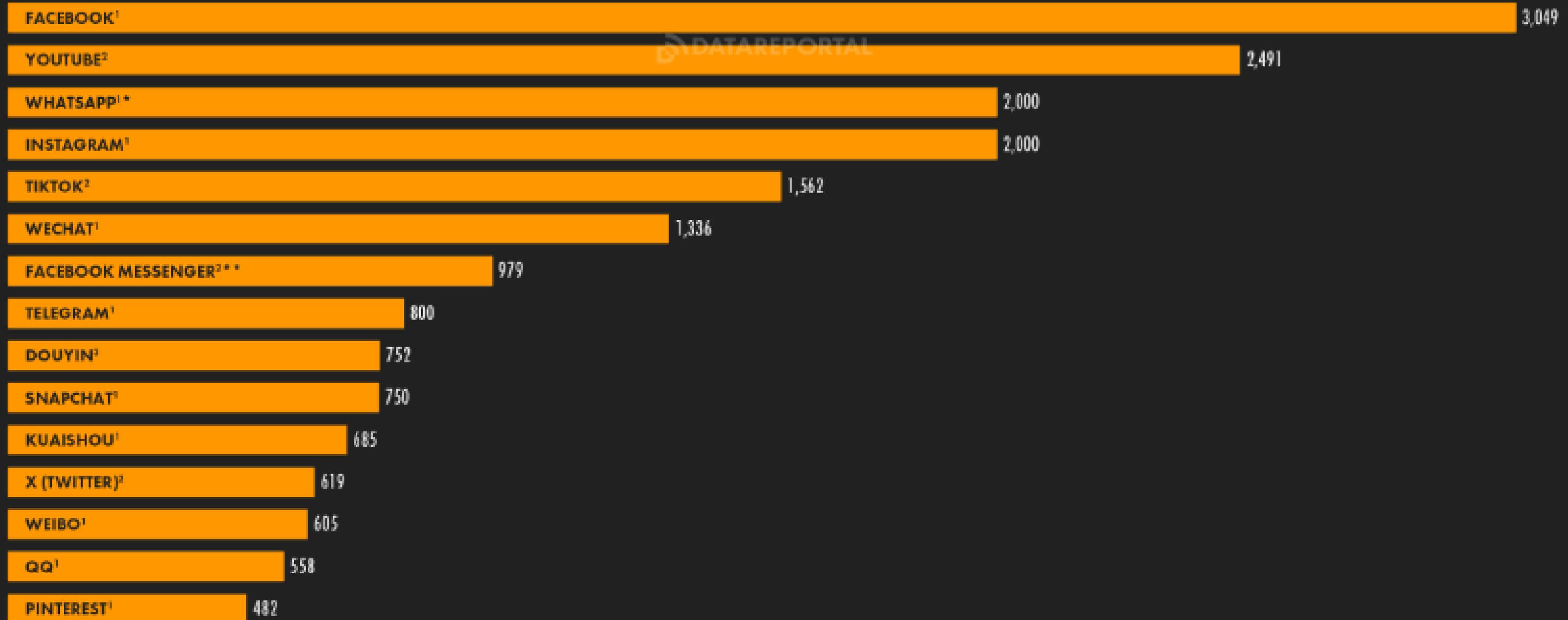
TOTAL vs. POPULATION

63.9%

JAN
2024

THE WORLD'S MOST USED SOCIAL PLATFORMS

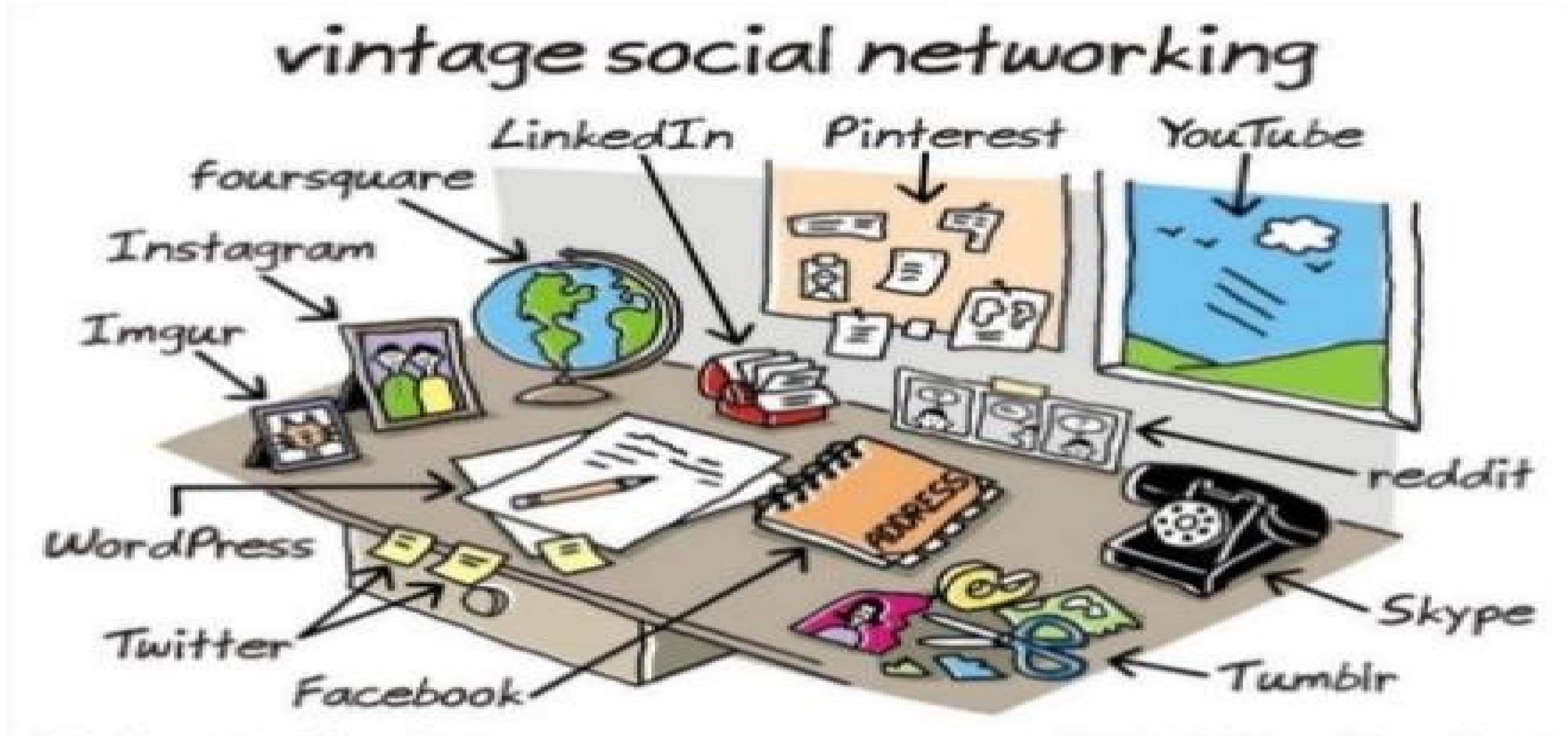
RANKING OF SOCIAL MEDIA PLATFORMS BY GLOBAL ACTIVE USER FIGURES (IN MILLIONS) (NOTE: USERS MAY NOT REPRESENT UNIQUE INDIVIDUALS)



SOURCES: KERIOS ANALYSIS OF (1) COMPANY ANNOUNCEMENTS OF MONTHLY ACTIVE USERS; (2) PLATFORMS' SELF-SERVICE ADVERTISING RESOURCES; (3) IIMEDIA. **ADVISORY:** USERS MAY NOT REPRESENT UNIQUE INDIVIDUALS. **COMPARABILITY:** (*) THESE PLATFORMS HAVE NOT PUBLISHED UPDATED USER FIGURES IN THE PAST 12 MONTHS, SO FIGURES MAY BE LESS REPRESENTATIVE. (**) SOME MESSENGER AD FORMATS ARE CURRENTLY UNAVAILABLE IN AUSTRALIA, CANADA, FRANCE, AND THE UNITED STATES, SO THE FIGURE SHOWN HERE MAY UNDER-REPRESENT FACEBOOK MESSENGER'S ACTUAL AUDIENCE. SOURCE AND METHODOLOGY CHANGES, BASE REVISIONS. SEE [NOTES ON DATA](#).

IN THE BEGINNING

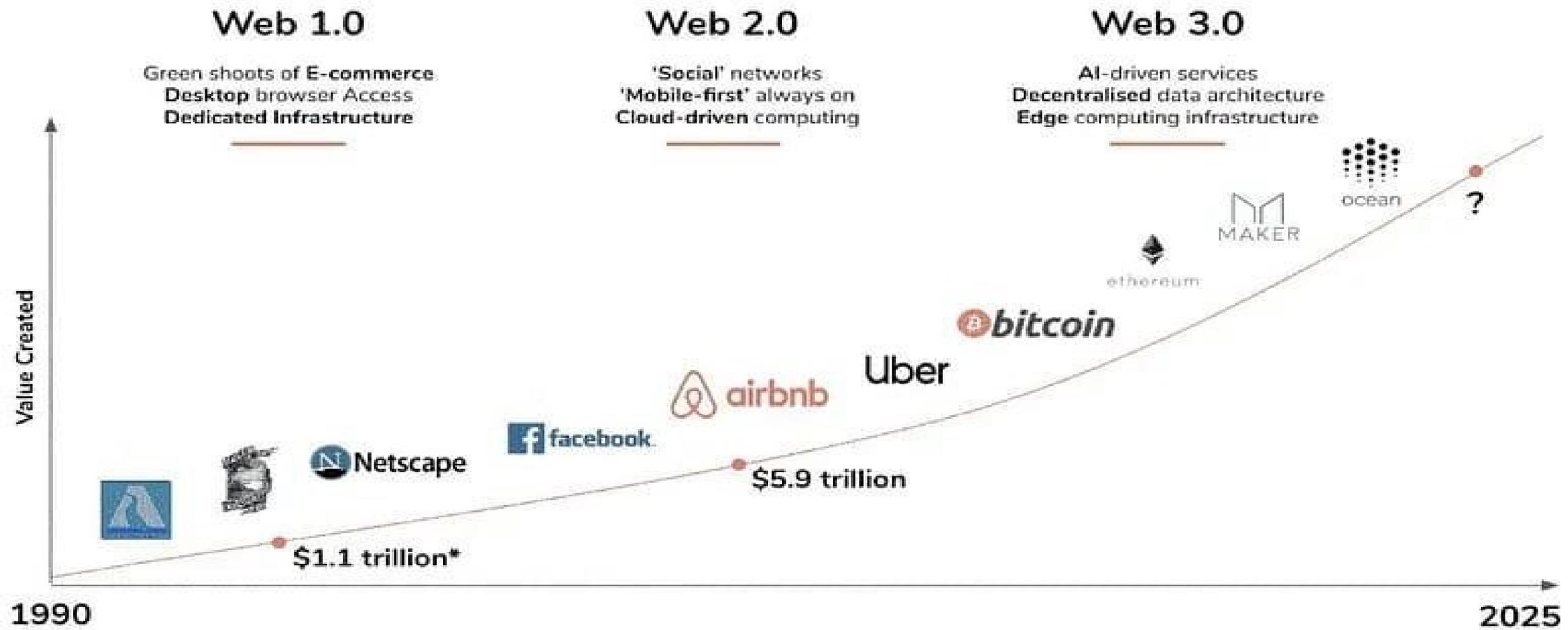
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EVOLUTION OF THE WEB

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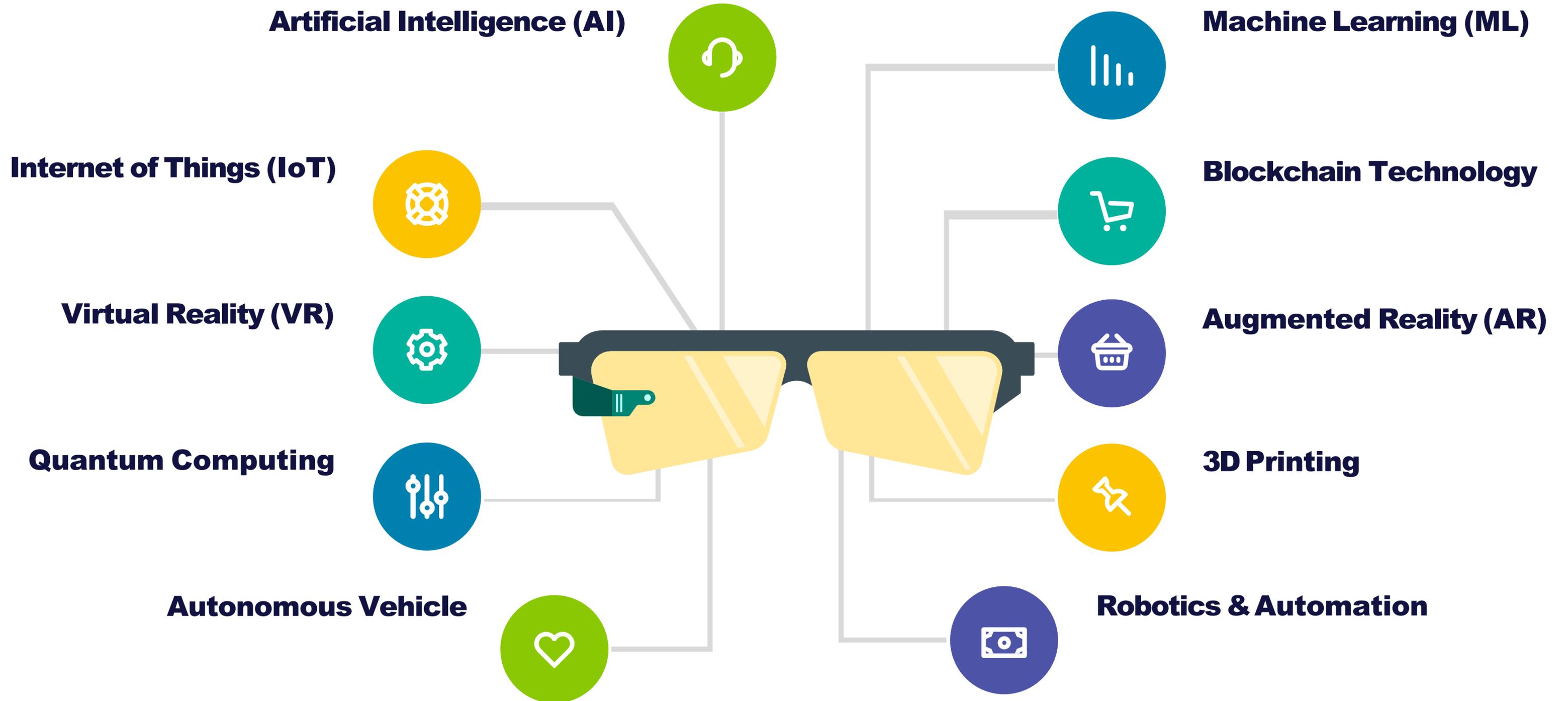
The Evolution of the Web



* Internet companies market cap as of 2000

DIGITAL TRENDS & EMERGING TECH

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5 Vs – DATA FRAMEWORK

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VERACITY
Integrity of Data

VALUE
Assets Valuation.



VOLUME

Refers to the amount of data generated through websites, online applications, transactions, data saved in records, files etc

VELOCITY

The speed of data processing generated in real time, online and offline, in streams, batches or bits.

VARIETY

Refers to the different types of data including structured and unstructured data, online images and videos, human generated texts, machine generated readings etc.

WHAT IS A DIGITAL WORKPLACE?

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AN ENVIRONMENT



TECH SOLUTION



STRATEGY



PROCESS

DW AS AN ENVIRONMENT

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Personalized Environment (Physical & Virtual)

Communication Suites for Gen Z Workforce (Hot-Desk/Co Working Space, Smart Intelligent Assets).

Co-creation & Collaboration

Social media - LinkedIn has launched a new employee directory service. Its Lookup service enables users to search for colleagues by name, title, experiences/specific skills etc. Also, LinkedIn Learning – on the agenda of One Digital Campus of Salford Uni.



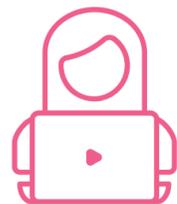
DW AS TECH SOLUTION

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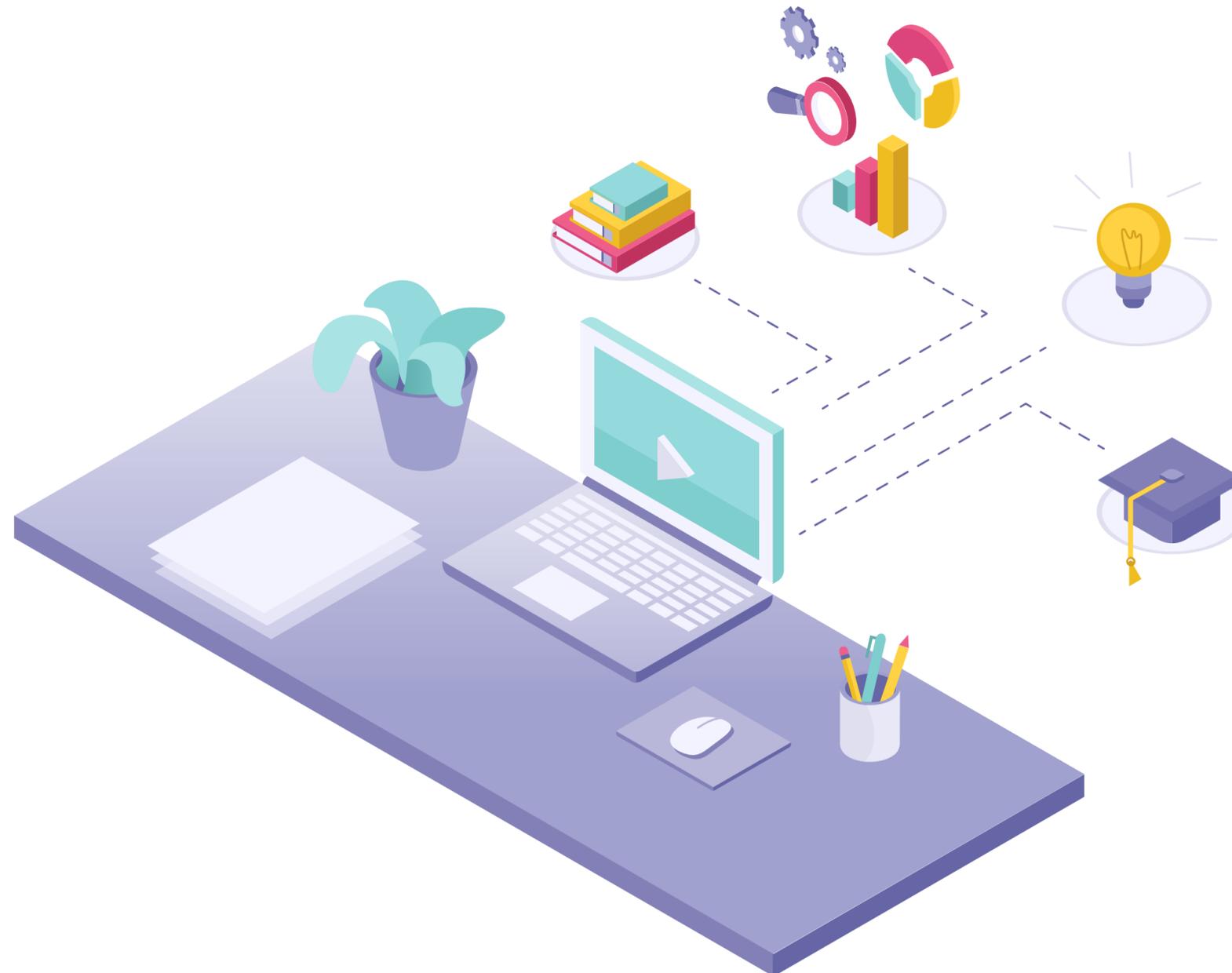
Smart Technology

1. Smart buildings are evolving into smart workplaces - IoT will merge your building and office closer to you



Communication

2. Seamless communication channels over web and mobile platforms



AI/RPA

3. Great use of AI/RPA (Robotic Process Automation) in businesses – automating tasks reducing costs and increasing productivity



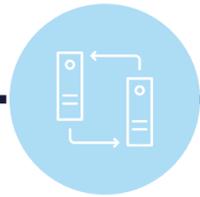
BYOA

4. BYOA (Build Your Own App) is next wave of individual empowerment – and IT need to make sure it can cope with different working methods

ROBOTIC PROCESS AUTOMATION (RPA)



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47%

JOB AUTOMATION
IN 20 YEARS



50%

POOR
IMPLEMENTATION



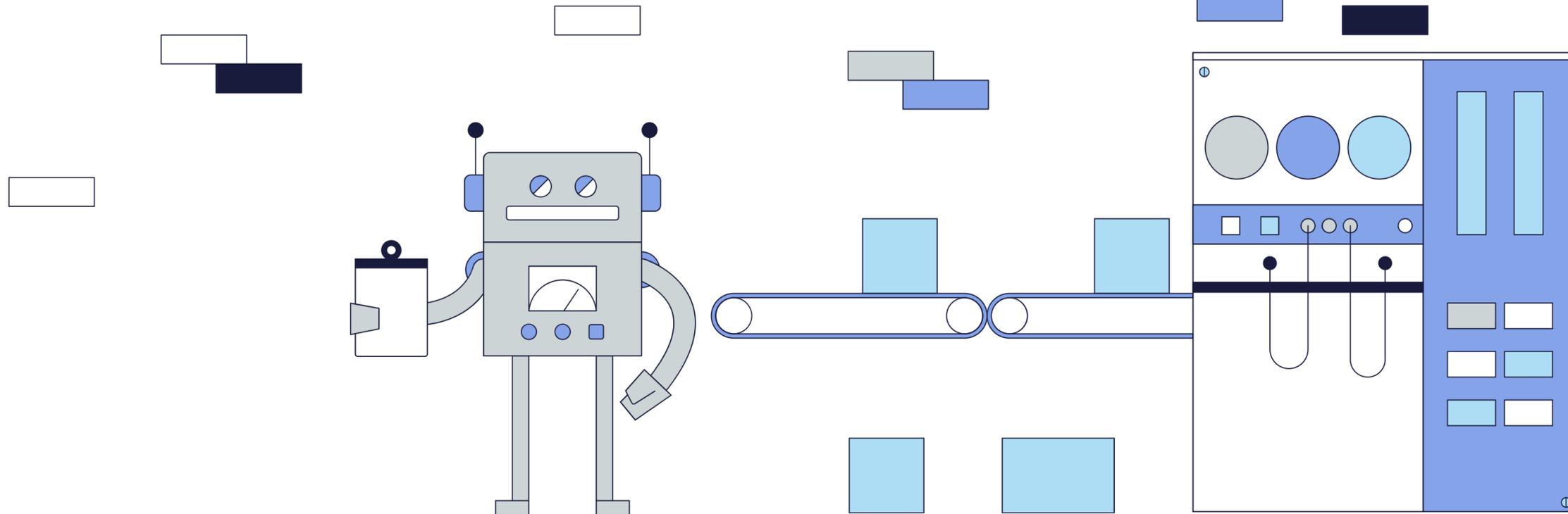
98%

BUSINESS
SUCCESS



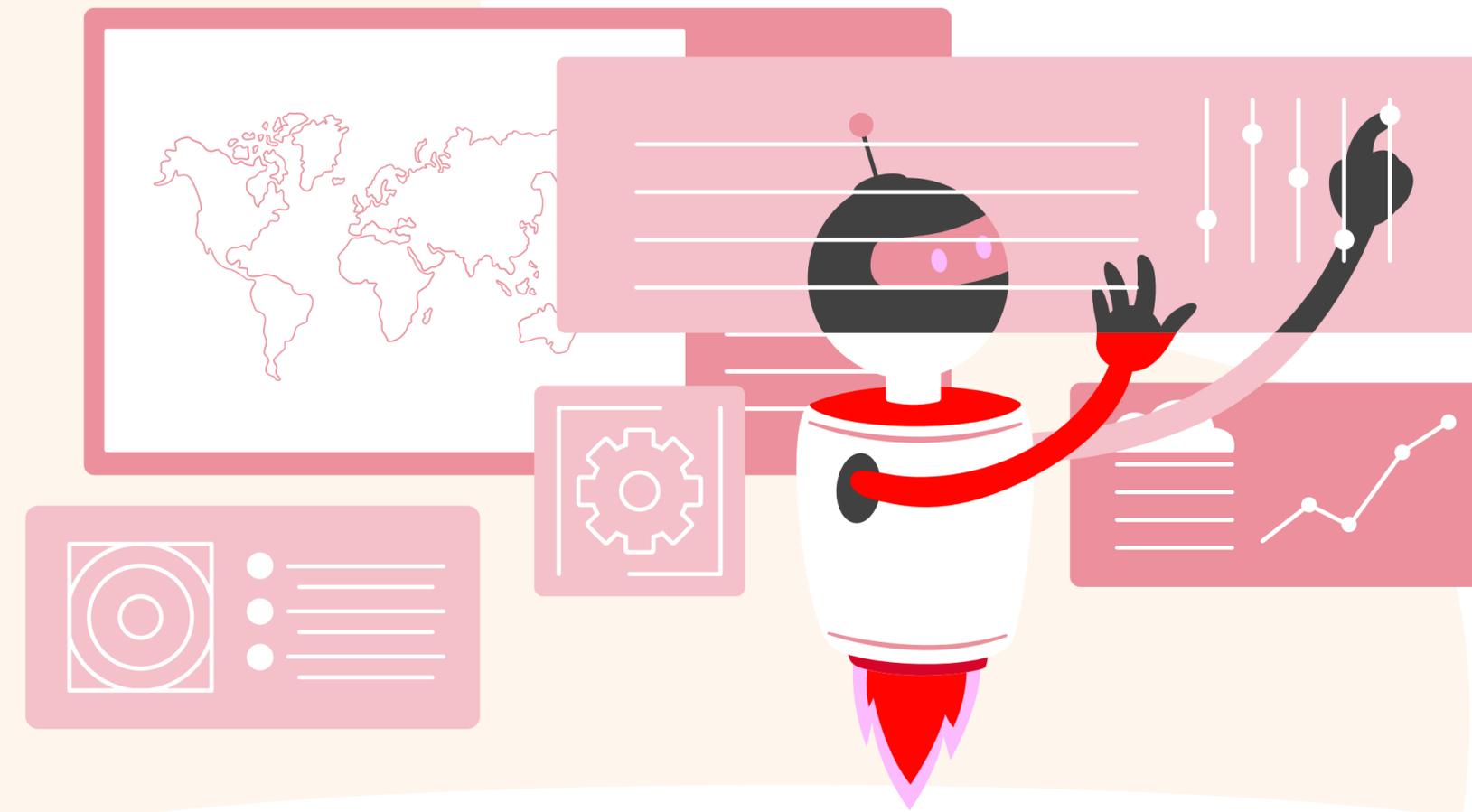
30%

LOW OPERATIONAL
COST - 2024



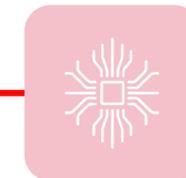
USE OF AI & RPA

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UK INSURANCE FIRM

With RPA and team of 4 can process 3000 claims a day – without RPA – need a team of 12;



AMAZON WAREHOUSE ROBOTS

Business Operation and Management.

ENHANCE EMPLOYEE EXPERIENCE

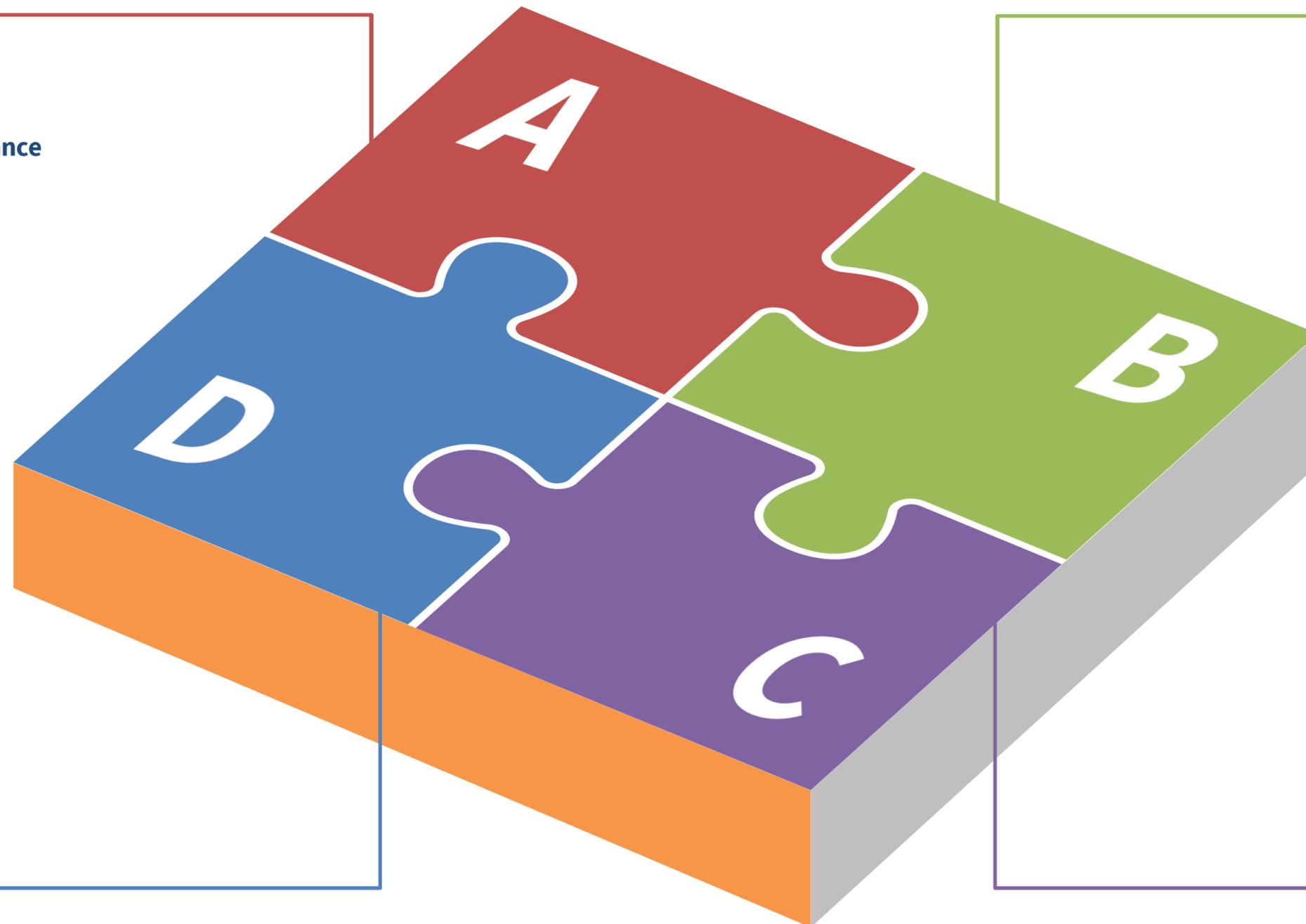
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Measures Employees Performance



Enhance Collaboration



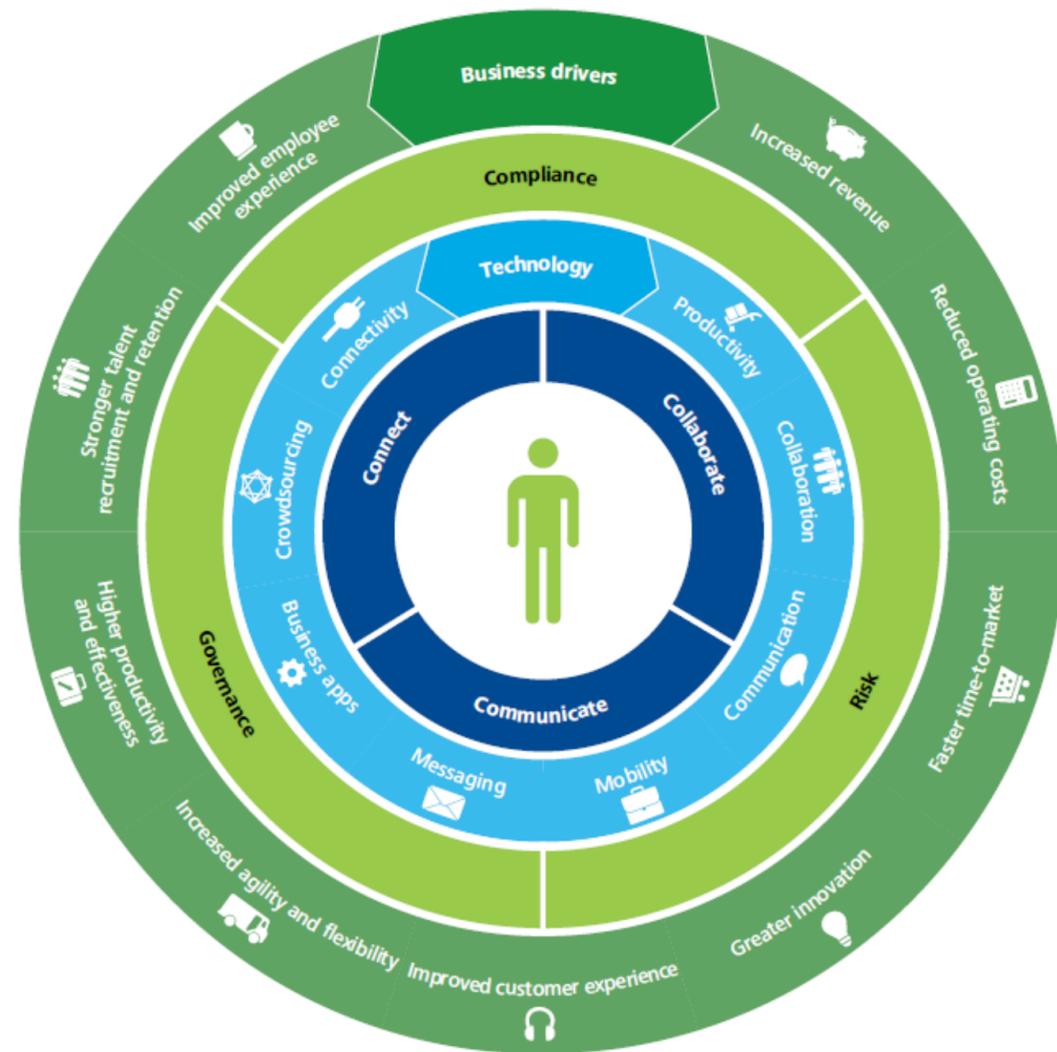
Takes Pulse of the Workforce

Connect Digital Workplace



DIGITAL WORKPLACE IS A STRATEGY

INTRODUCTION TO CYBERSECURITY MANAGEMENT SYSTEM

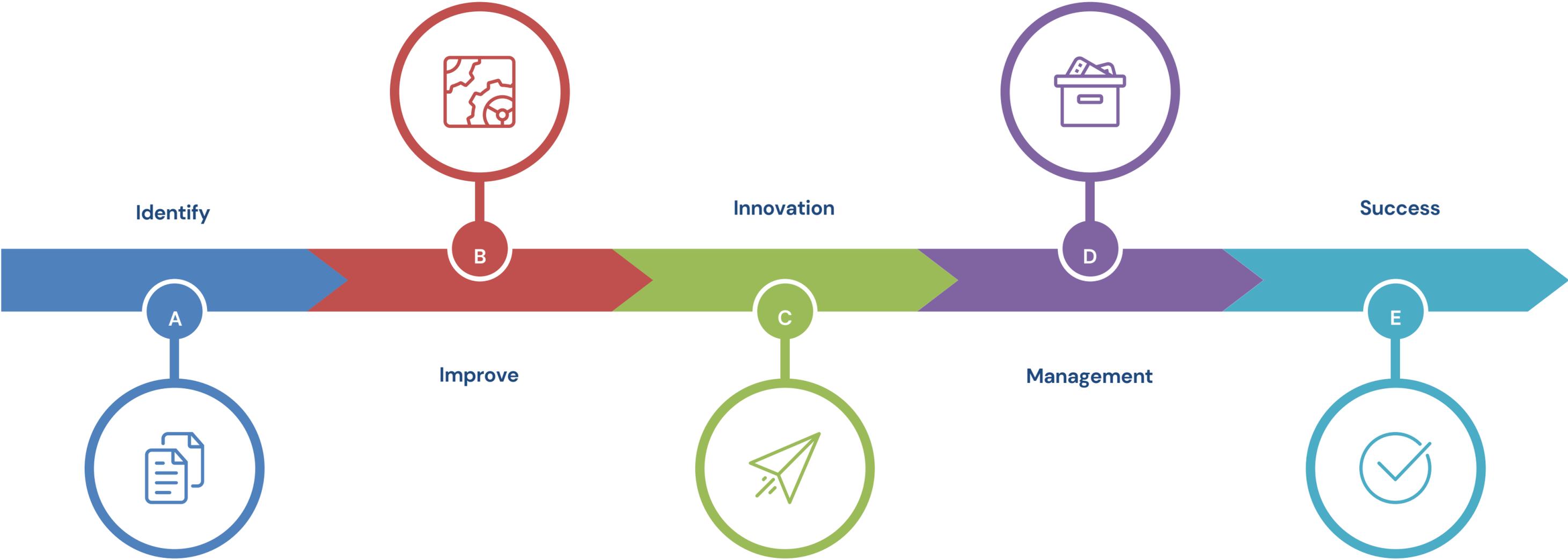


- User: collaborate, communicate, connect
- Technology: the digital toolbox
- Control: governance, risk and compliance
- Business drivers: measurable business value

Source: The digital workplace: Think, share, do. Deloitte

DIGITAL WORKPLACE IS A **PROCESS**

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



WHY DIGITAL WORKPLACE?

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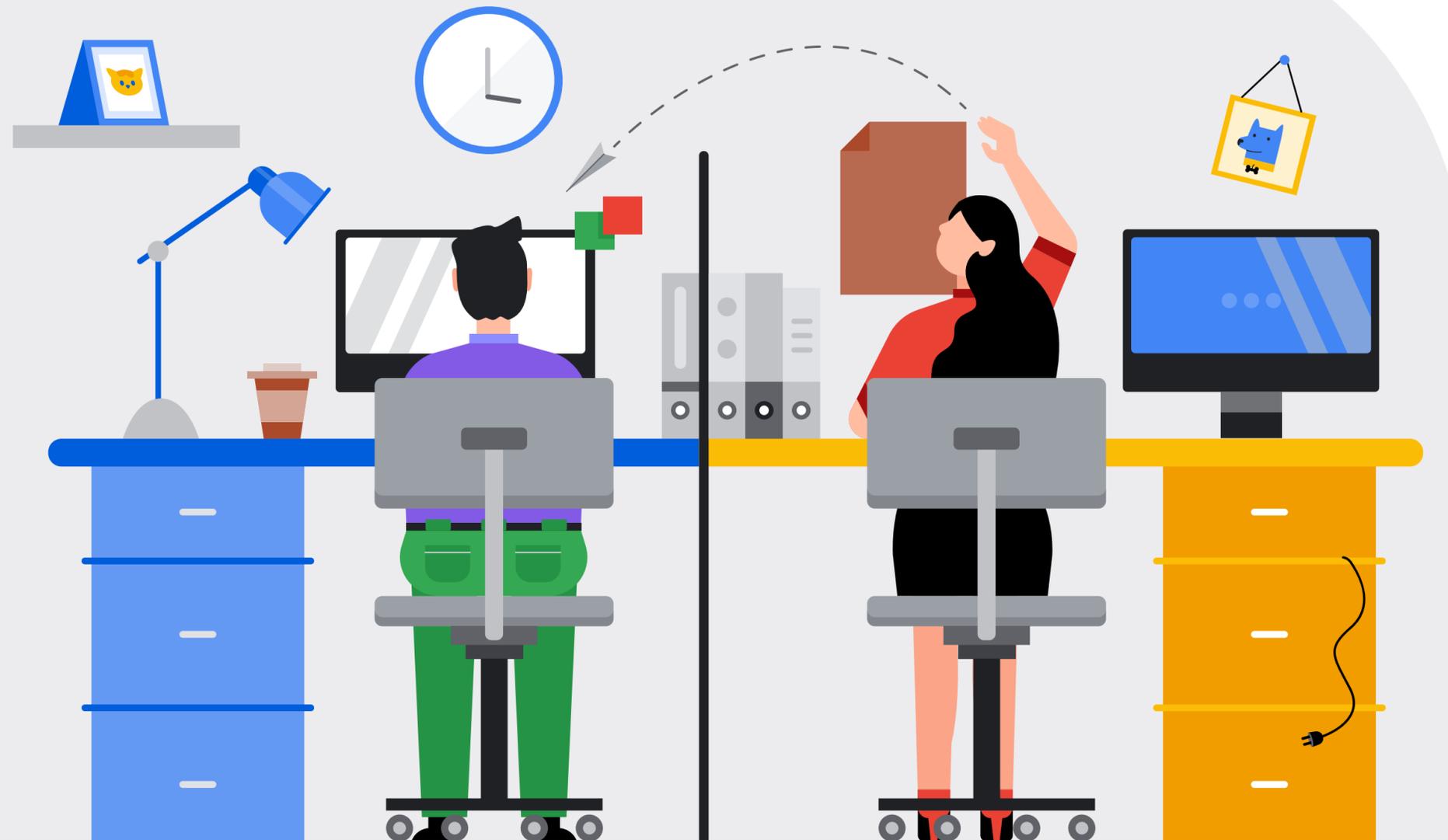
**WORK IS NOT A LOCATION
BUT AN ACTIVITY.**



OPERATIONAL EFFECTIVENESS



**INNOVATION, INTEGRATION &
COLLABORATION**

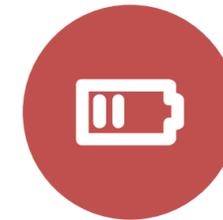


HOW TO IMPLEMENT DIGITAL WORKPLACE?

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PEOPLE



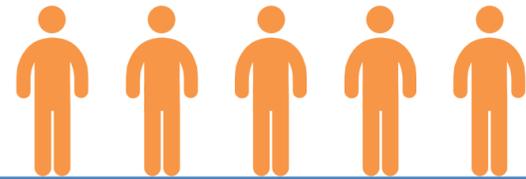
TECHNOLOGY



ORGANIZATION

4 FUNDAMENTAL STEPS?

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01

Understanding Business Requirements
Business Analysis and Crowd Sourcing.

02

Design Digital Workplace
Technology,
Infrastructure & Security



03

Set Deployment Strategy
Change & Transition
Management

04

Monitor & Evaluate
Quality Management
System



WHAT DOES DIGITAL WORKPLACE MEAN TO YOU? ■■■■

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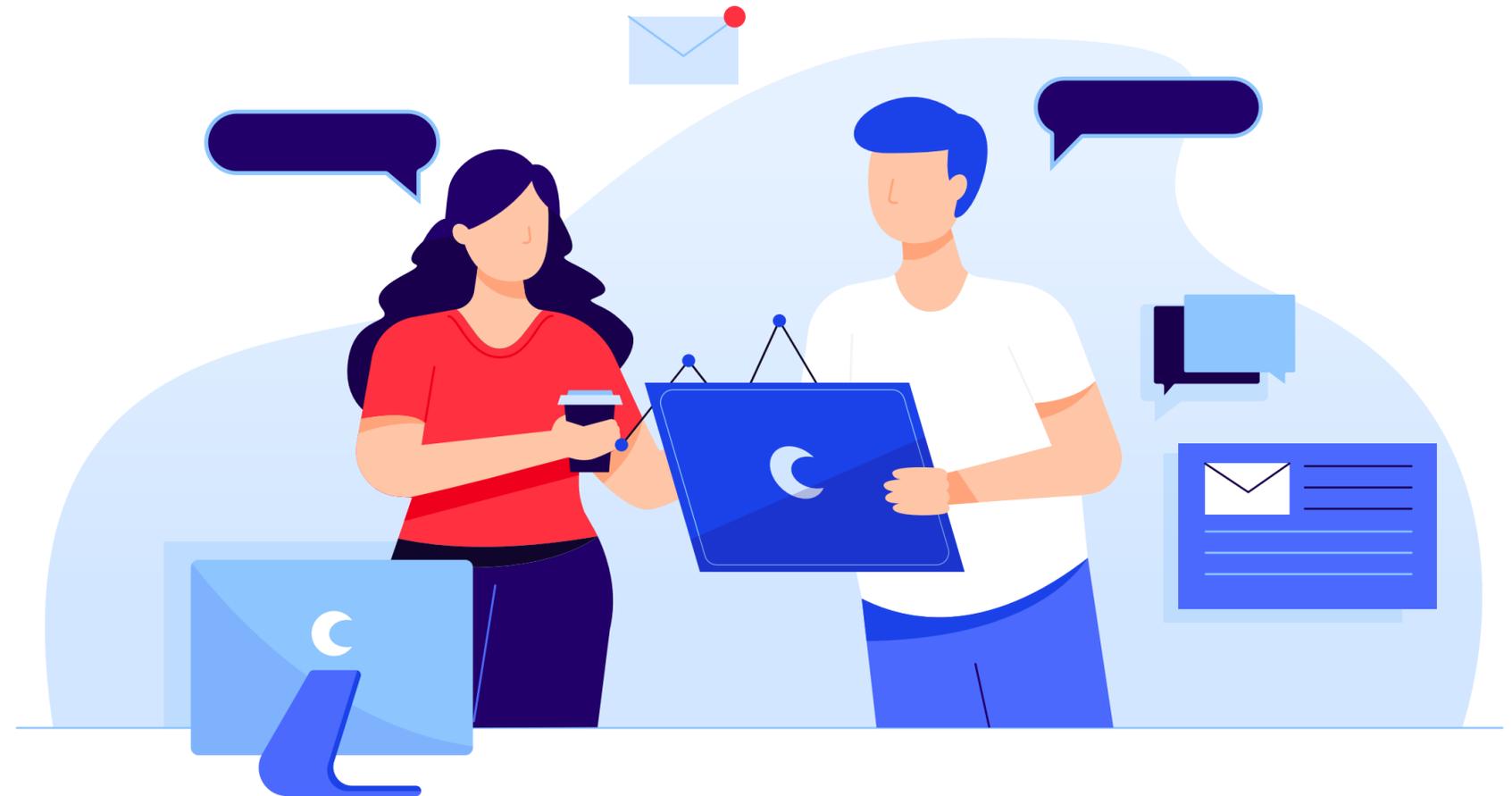
CONTINUOUS LEARNING



ADOPTION OF DIGITAL TOOLS



DIGITAL FACILITIES





WHAT IS DIGITAL DIVIDE?

INTRODUCTION TO CYBERSECURITY MANAGEMENT SYSTEM

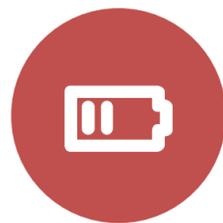


“Refers to the disparity in access to and use of ICTs and the Internet for a wide range of purposes at different socio-economic levels.”



AGENT

The individual who accesses the technology.



CHARACTERISTICS OF AGENT

The attributes or traits possessed by the individual



METHOD OF CONNECTION

The way the individual establishes a connection .



TARGET SYSTEM

The specific systems to which the individual establishes connections



3 STAGES OF DIGITAL LITERACY

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DIGITAL COMPETENCE

In which new skills are gained.



DIGITAL USAGE

In which these skills are used in an applied setting.

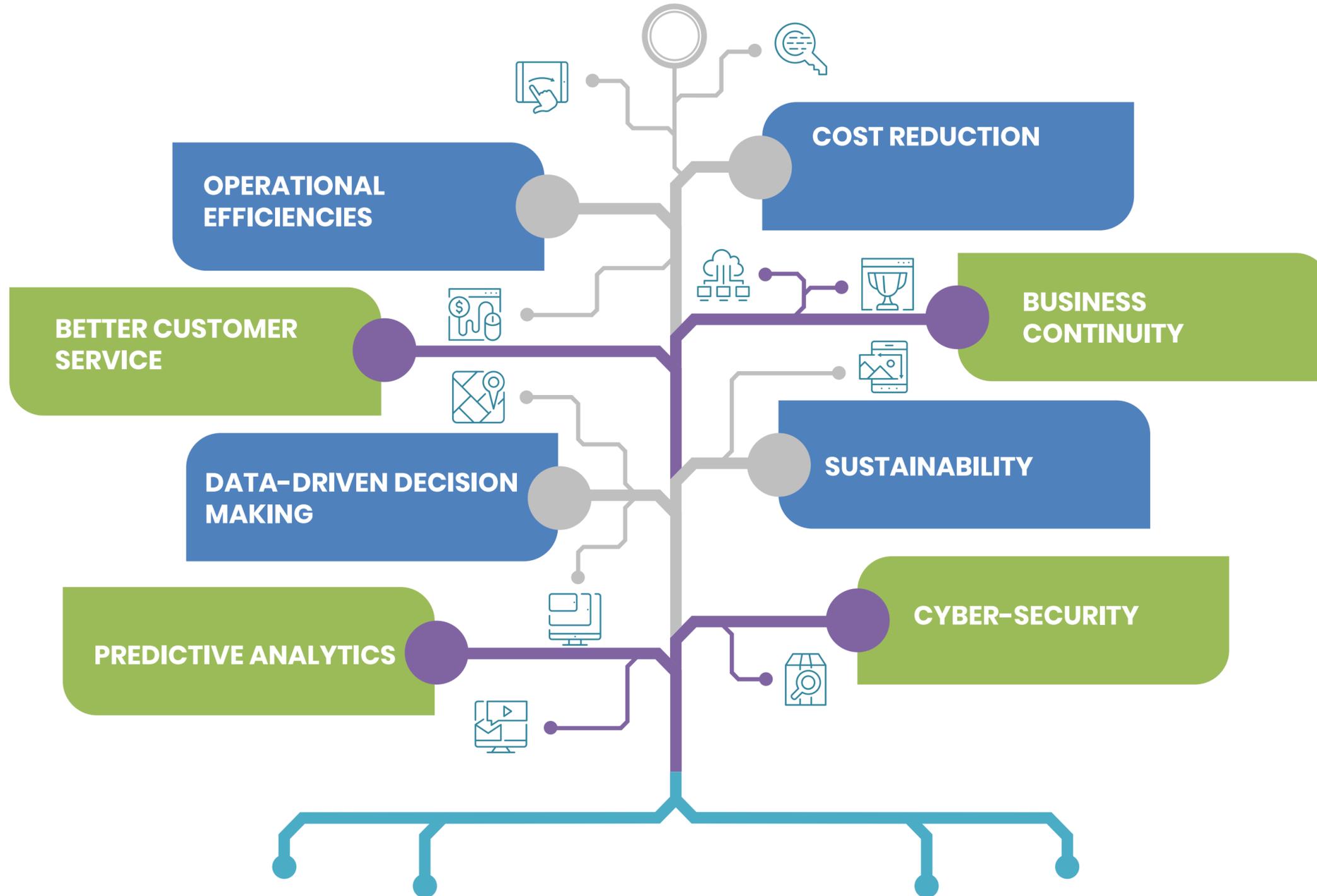


DIGITAL TRANSFORMATION

In which the application of skills leads to Innovation and Creativity.

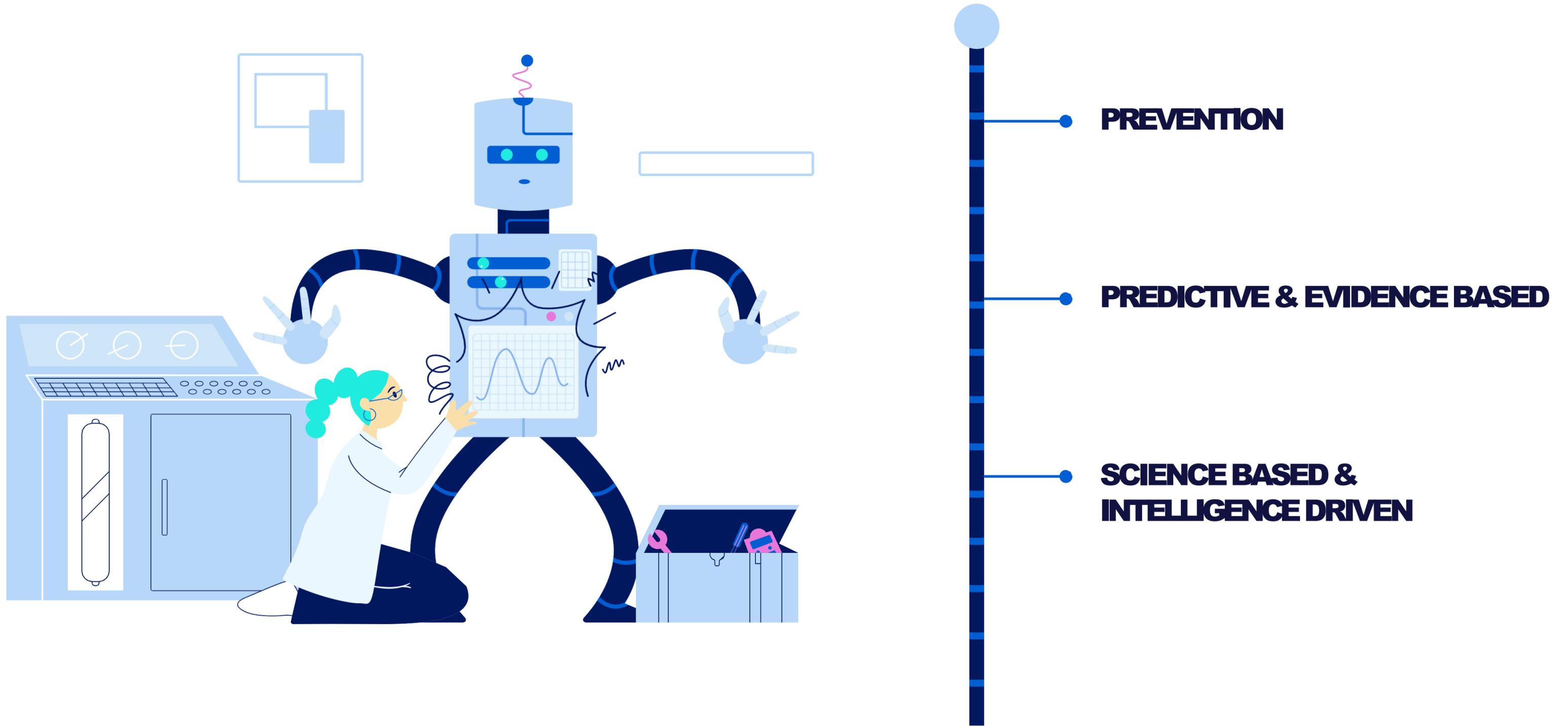
THE GOOD OF AI

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FUTURISTIC POLICING

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LOCARD'S EXCHANGE PRINCIPLE

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Locard's Exchange Principle

" Wherever he steps, whatever he touches, whatever he leaves, even unconsciously, will serve as a **silent witness** against him. Not only his fingerprints or his footprints, but his hair, the fibers from his clothes, the glass he breaks, the tool mark he leaves, the paint he scratches, the blood or semen he deposits or collects. All of these and more, bear mute witness against him. This is evidence that does not forget. It is not confused by the excitement of the moment. It is not absent because human witnesses are. It is **factual evidence**. Physical evidence cannot be wrong, it cannot perjure itself, it cannot be wholly absent. Only human failure to find it, study and understand it, can diminish its value"

- Professor Dr. Edmond Locard



CASE STUDY 1: FORENSIC 101: BTK KILLER

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Dennis Lynn Rader – BTK Killer

Serial Killer: “Bind, Torture, Kill” victims

Evaded Law Enforcement for decades

Analysis of a Floppy Disk led to his arrest.

Major breakthrough in Digital Forensic

Investigation

DIGITAL EVIDENCE

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WHAT TO COLLECT
Digital & Electronic Evidence

HOW/WHAT TO EXAMINE

Tools
Link Analysis
3rd Party Verification



HOW TO COLLECT

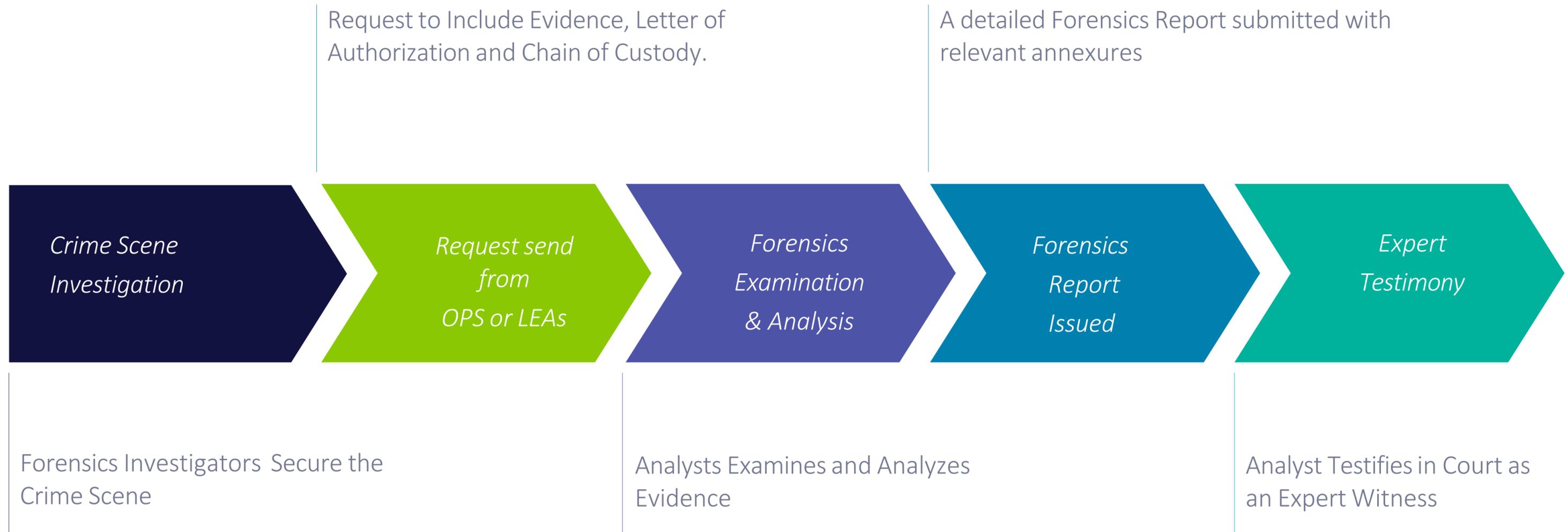
Crime Scene Management; Chain of Custody, SOP & Chain of Custody

WHAT TO PRESENT

Forensics Report, Certificate of Authentication & Supporting Documents (Certified True Copies)

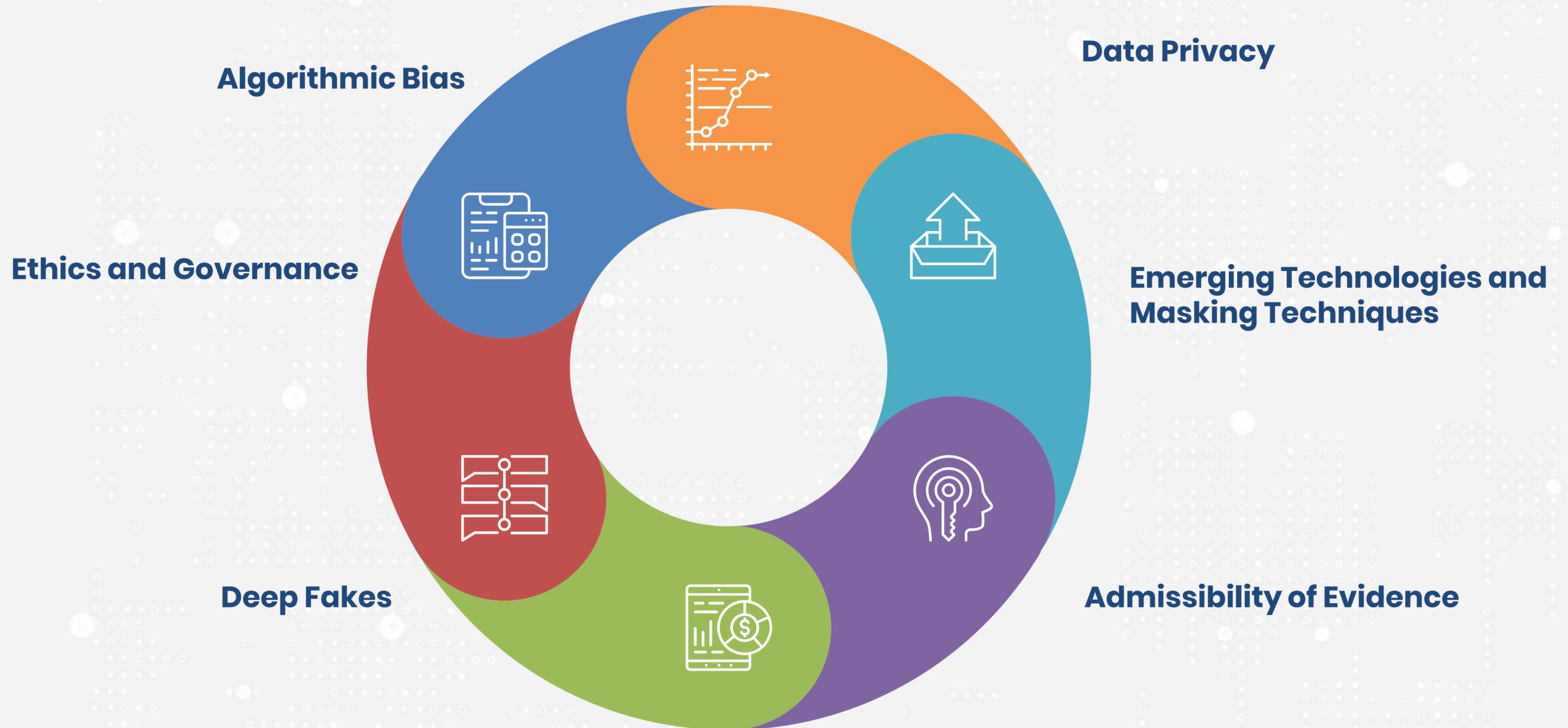
CRIMINAL INVESTIGATION CASE FLOW CHART

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THE BAD OF AI

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



CASE STUDY 1: MR. HUSH

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



SOCIAL MEDIA
INFLUENCER



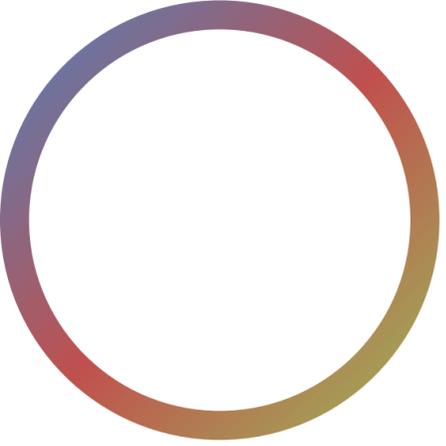
CYBER-CRIMINAL



MULTIPLE
JURISDICTION

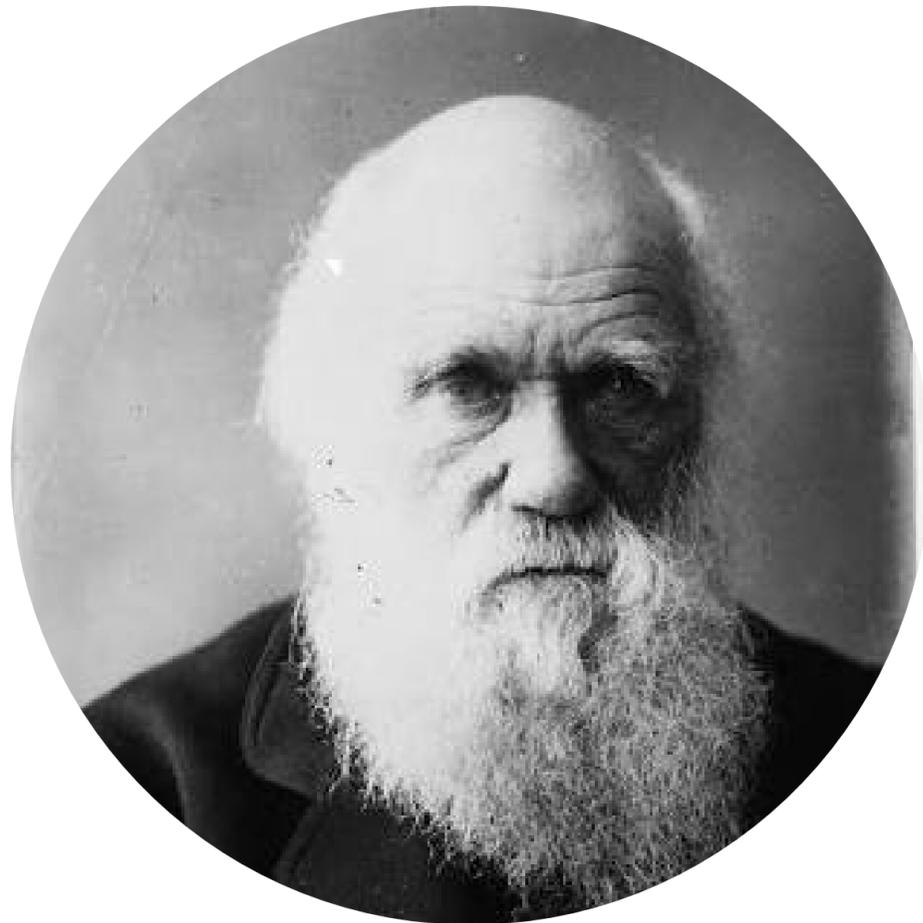


ONLINE EVIDENCE - INSTAGRAM



PHILOSOPHICAL QUOTE

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



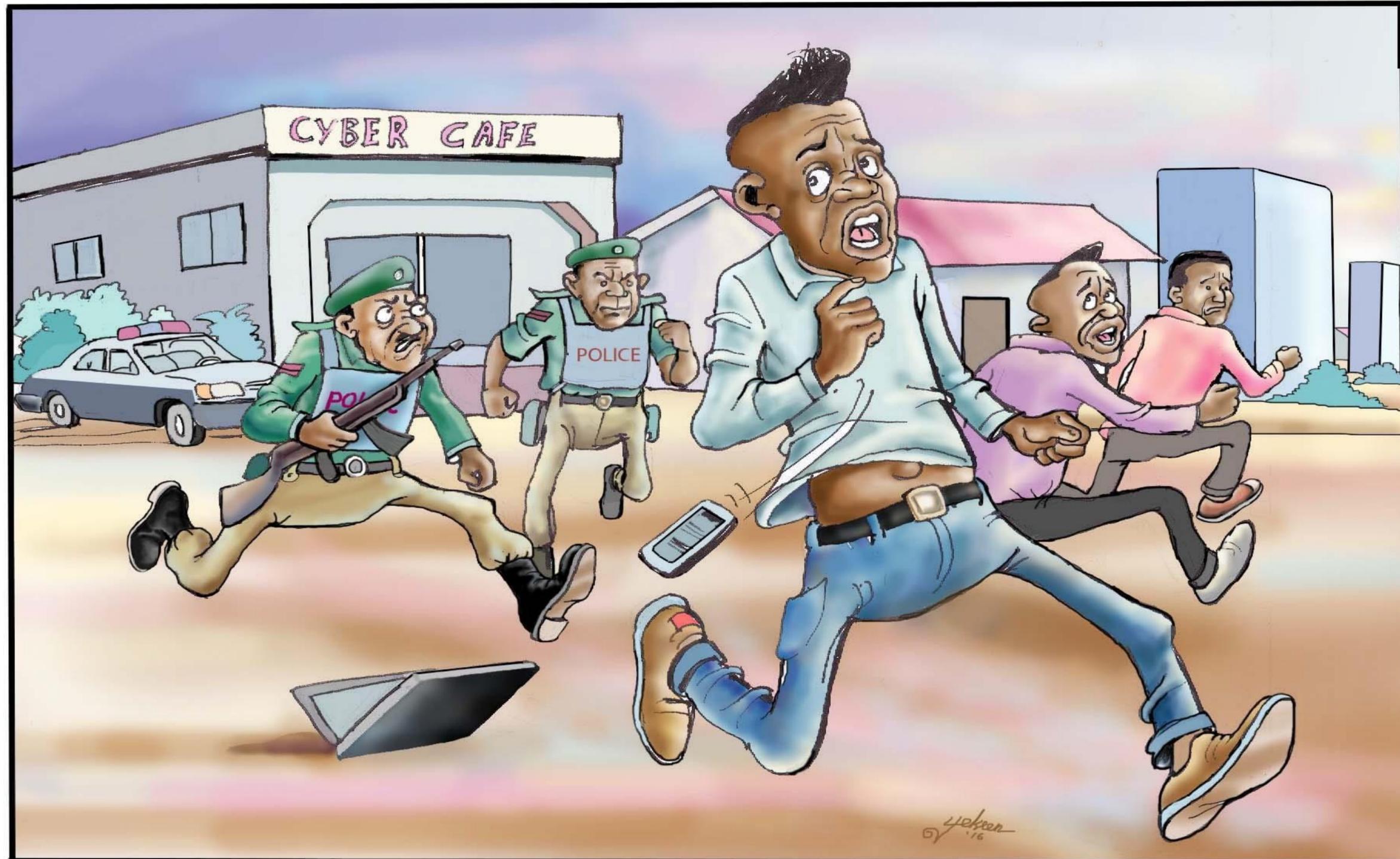
CHARLES DARWIN

“It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change”



WHAT IS CRIME?

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



CRIME, TERRORISM & MODERN-DAY SLAVERY

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

SEXTORTION

TERRORISM

**ONLINE SEXUAL EXPLOITATION
OF CHILDREN**

MODERN DAY SLAVERY

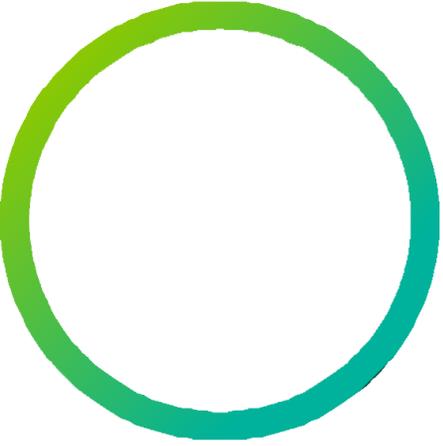
CYBER-CRIME

CYBER-WARFARE

CYBER-TERRORISM

BEC





CRIMINOLOGICAL THEORY - RAT

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



Cohen and Felson (1979) argued that for crime to take place, three requirements needed to be present namely, a motivated offender, a suitable target and an absence of a capable guardian.

LACK OF A CAPABLE GUARDIAN

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



1

ARE LAW ENFORCEMENT CAPABLE GUARDIANS?

2

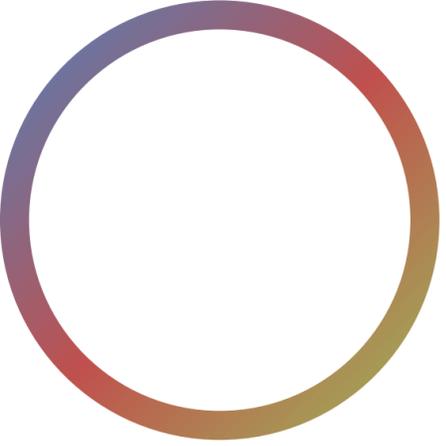
CRITICAL INFRASTRUCTURE PROTECTION

3

DIGITAL TRANSFORMATION/TECHNOLOGY

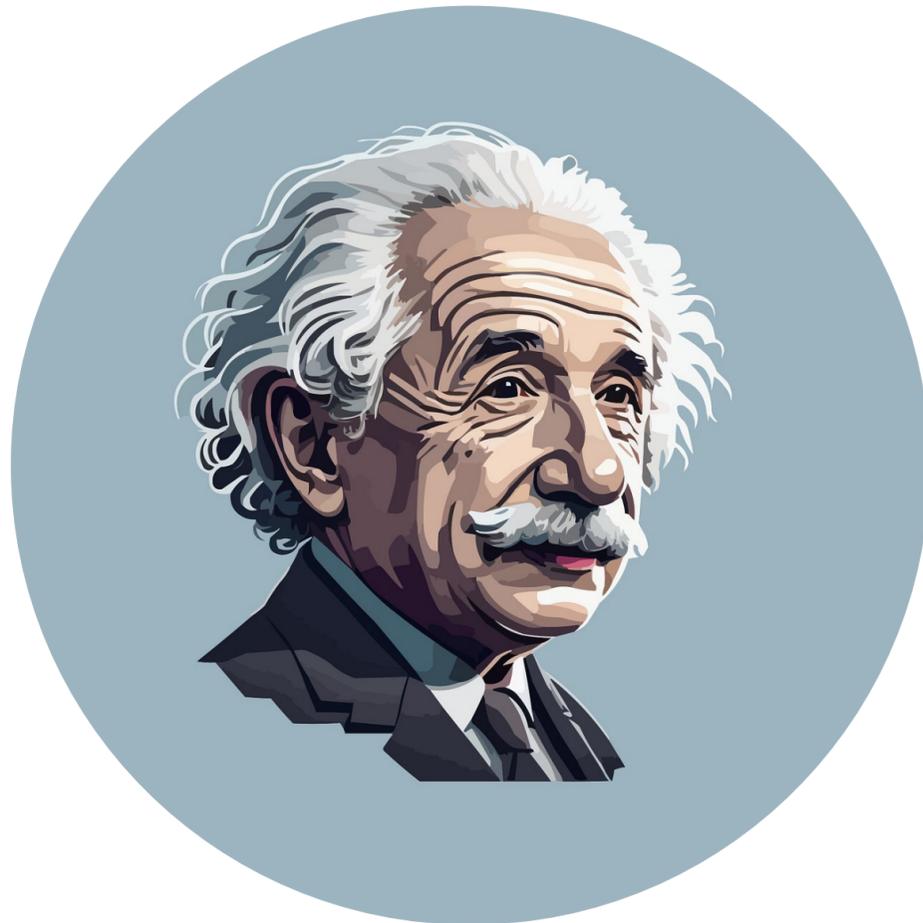
4

POLICIES & LAWS



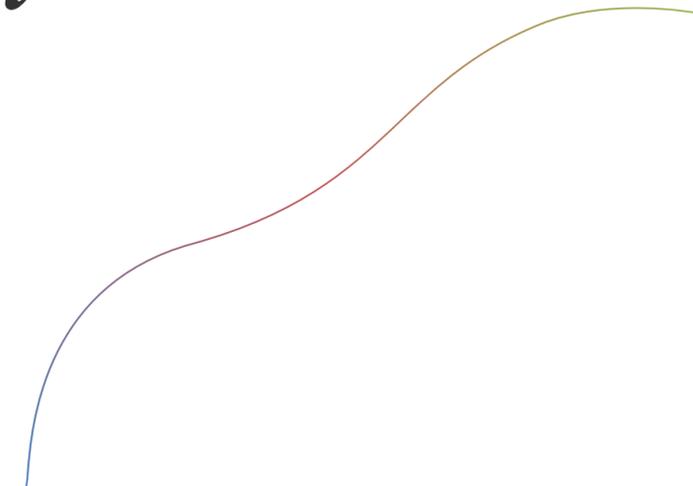
QUOTE OF THE DAY

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



Albert Einstein

*"We cannot solve problems
with the same thinking we used
when we created them"*



CASE STUDY 2: SAN BARNADINO TERRORIST SHOOTING

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



TERRORIST
SHOOTING



STATE VS APPLE



ONLINE
RADICALIZATION



APPLE I-PHONE
(PRIVACY)

CASE STUDY 4: ILLEGAL OIL BUNKERING

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

Justice Chukwu after listening carefully to the witness adjourned the case to May 28 for continuation of trial.

A forensic analyst with the Economic and Financial Crimes Commission, EFCC, Muktar Bello, on Thursday told a Federal High Court sitting in Abuja how Dodo Bulus, an Assistant Superintendent of Police, ASP, connived with vandals to break pipelines and siphon crude oil.

Mr. Muktar, who was led in evidence by EFCC counsel, Salisu Majidadi, told the court, presided over by Justice E. S. Chukwu, how forensic examination of the mobile phones of the accused persons established their complicity in the crime. He said he conducted the examination using a Cellebrite device.

A Cellebrite device, according to the witness, “is a forensic extraction device commonly used by law enforcement agencies, military and corporate security agencies in over sixty countries of the world. The device has an in-built mechanism that protects the data extracted which is automatically transferred to a computer”.

The EFCC witness further told the court that his findings established that there was communication between Mr. Bulus and a suspected vandal, Joseph Amaechi, who is currently standing trial in a sister case before the same court.

Part of the report of Mr. Muktar’s findings, which was tendered and admitted as exhibit, reads: “that Joseph Amaechi received a text from Dodo Chilla Bulus regarding information that vandals are to operate tonight, February 13, 2013 at 7.43pm”.

CASE STUDY 4B: ILLEGAL OIL BUNKERING

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

Case of suspected Oil Pipeline Vandalism

Involved three parties: Vandals + Security + Contractors

Analysis of Suspects Phones found SMS that implicated them.

Link and Time Analysis of CDR put suspects in the same location as of the time of the crime

Retrieved deleted Images and SMS as far back as 2008

CASE STUDY 5: MILITARY COURT MARTIAL

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



 **Cross
Examination**

 **FORENSICS REPORT**

 **TECHNICAL
QUESTIONING**

 **AUTHORIZATION**

ROLE OF AN EXPERT WITNESS

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

- Person engaged to give an opinion based on his/her experience, knowledge and expertise
- Duty of an Expert Witness is to provide:
 - independent,
 - impartial and unbiased evidence to the court or tribunal.



CASE STUDY 6: KILLING OF BOKO HARAM LEADER

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



Alleged Killing by LEA



Evidence Based on Video



5 Police Officers Charged



Defendant discharged & Acquitted

YOUTUBE LINK: <https://youtu.be/tlpZr8IRUcY?si=My1f-KstnV-9rCr4>

SOCIAL MEDIA & AI: IS IT A TOOL FOR TERRORISM?

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

UNODP (2017). A Tool for Terrorism: Exploring How ISIL, Al-SHABAAB And Boko Haram Use Social Media In Africa

SOCIAL MEDIA TRENDS

SOCIAL MEDIA PLATFORMS



Terrorist Use Wide Range of Platforms: **FaceBook, Twitter, WhatsApp, Telegram**

PROPAGANDA



Use Social Media to publicise attacks, operational victories, tactics etc

RECRUITMENT



Online Recruitment Strategy using Social Media

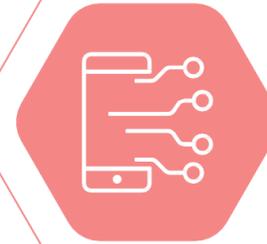
OFFLINE INFLUENCES



Role of Social Media complimented by offline peer influences

THE UGLY OF AI

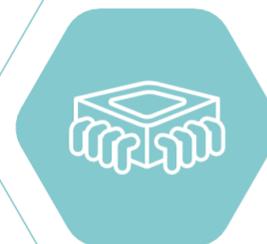
OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



DEEP-FAKE PHOTO-PAEDO. CYBER-RAPE?



AI CRIMES, ROBOT CRIMES, "TERRORISM", DRONE OFFENSES



"INDUSTRIAL GENOCIDE"?



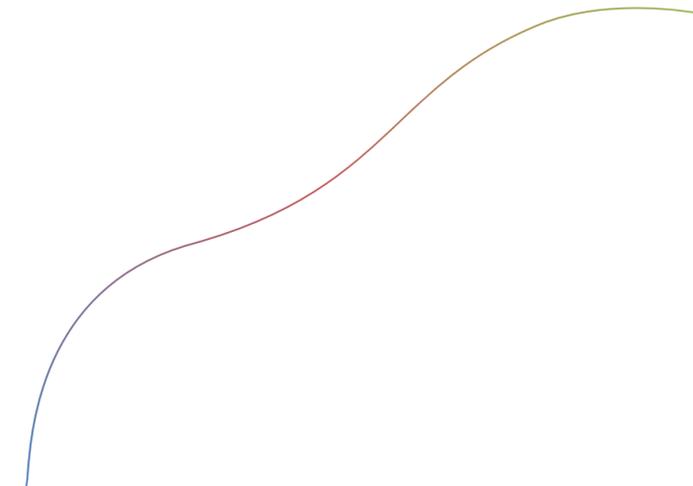
PHILOSOPHICAL QUOTE

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



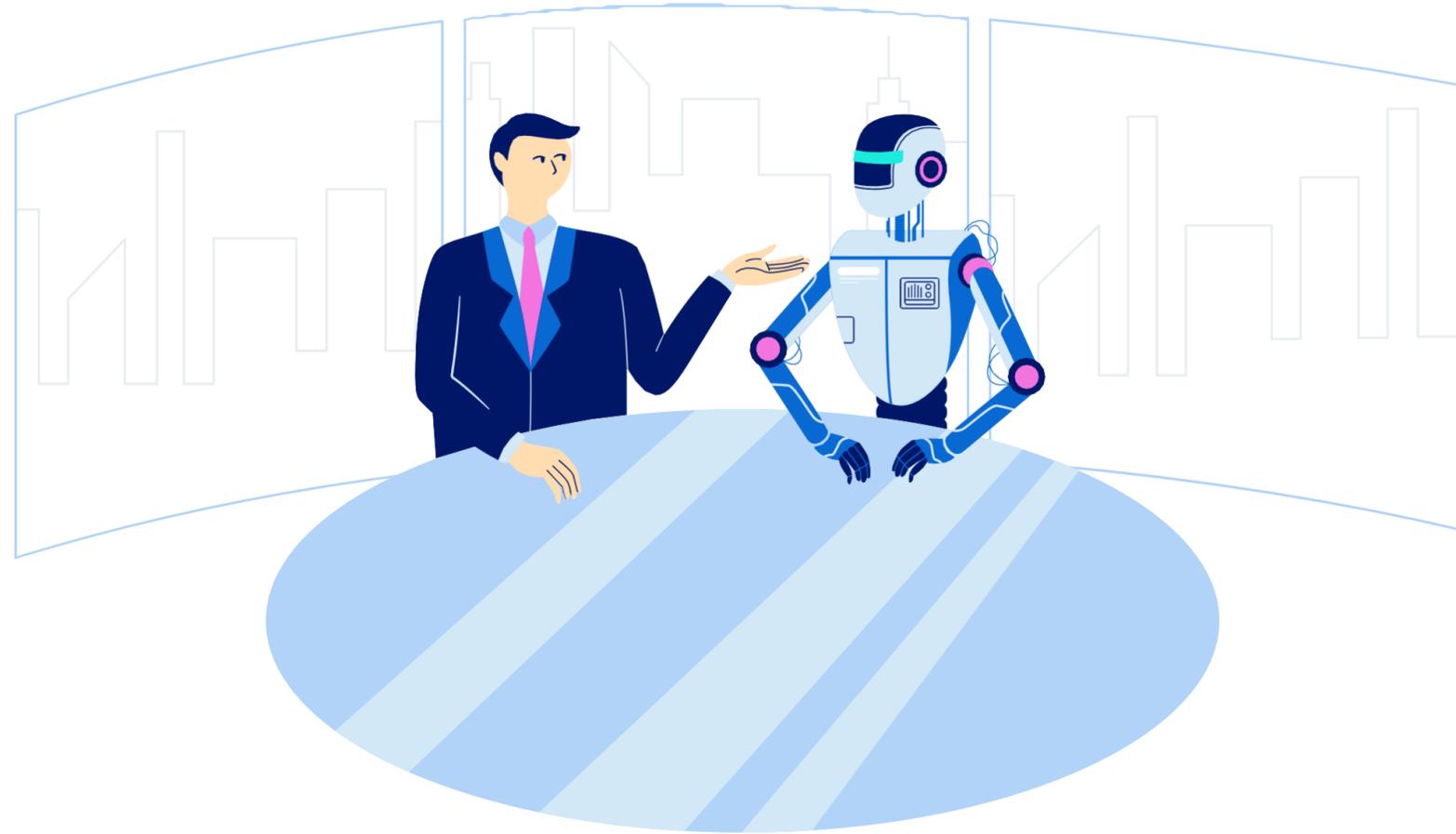
PETER DRUCKER

“The best way to predict the future is to create it”



WAY FORWARD

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



A

ASSUME NOTHING

Stakeholders in the
Criminal Justice System

B

BELIEVE NOTHING

Technological Solutions

C

CHECK EVERYTHING

Law, SOP and Policies

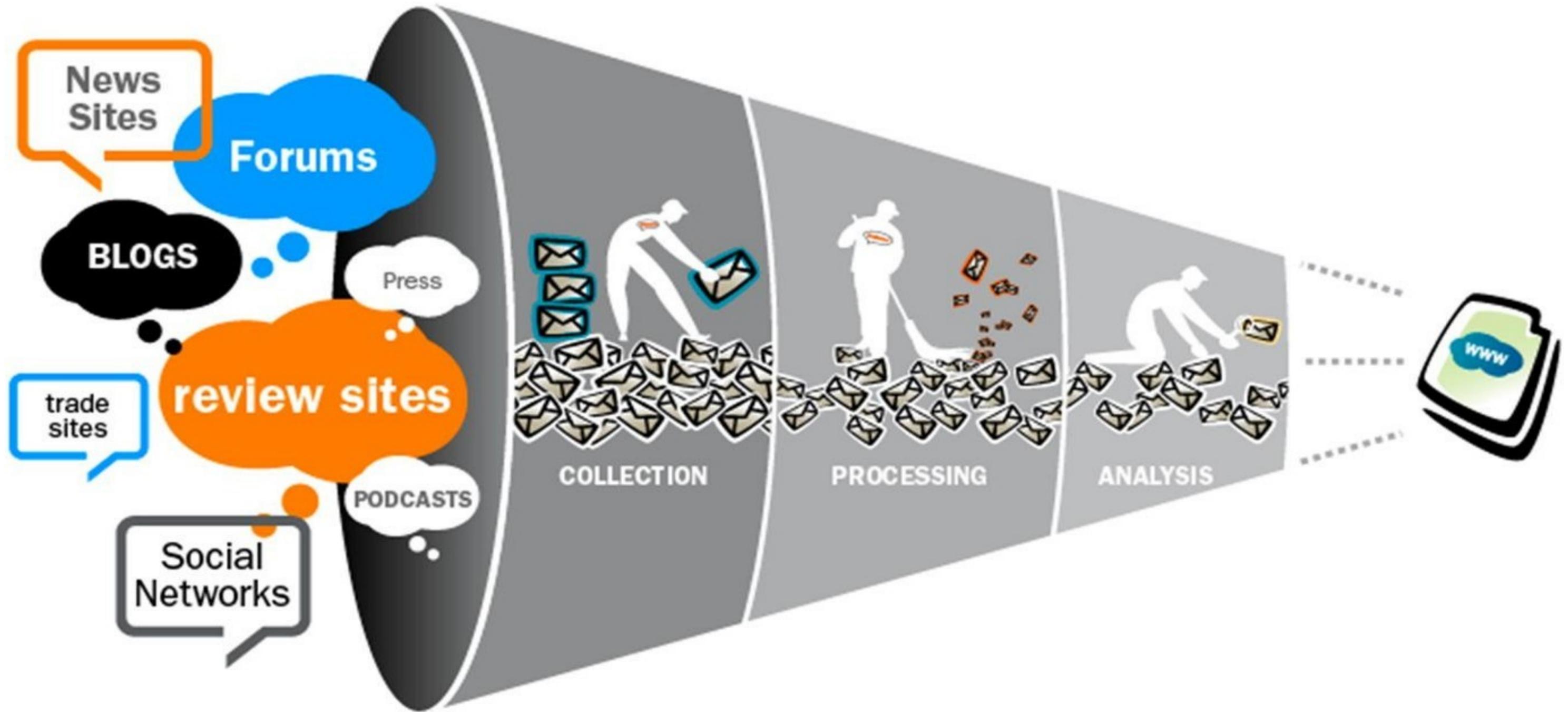
GAMIFICATION

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



OPEN SOURCE INTELLIGENCE (OSINT)

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



SOCIAL MEDIA FORENSIC INVESTIGATION

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

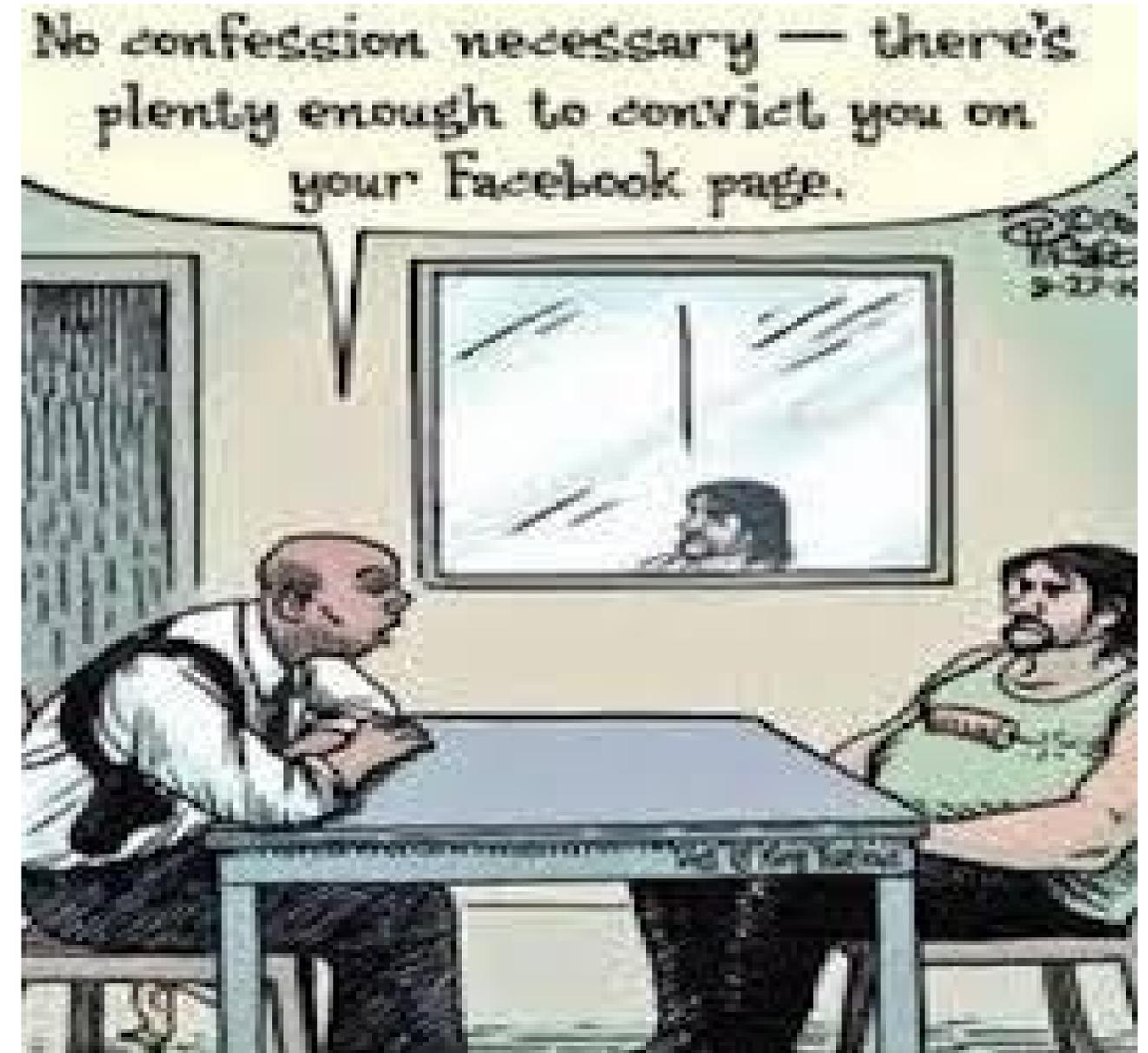
- The Application of Computer Investigation and analysis Techniques to gather evidence from online sources, suitable for presentation in a court of law



SOURCES OF SOCIAL MEDIA EVIDENCE

OSINT - FORENSIC SCIENCE INVESTIGATION

- 200+ Social Media outlets
- 800+ Online Services
- Blogs
- Company or Personal Websites
- Interest Forums
- Government Websites
- Archival Sites



SOCIAL MEDIA STAKEHOLDERS

OSINT - FORENSIC SCIENCE INVESTIGATION

- Users
- Content Owners
- Investigators
- Service Providers
- Courts & Attorneys
- Law Enforcement
- Companies & Marketers
- The Public



COLLECTION METHOD

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

- Screen Shots
- Manual Documentation
- Open Source tools (HTTrack)
- Commercial Tools (X1)
- Web service (Pagefreezer)
- Forensic Recovery
- Content subpoena



ETHICAL METHODS

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

- Laws that prevent from searching subjects on social media.
- Multiplication of Messages on Social Media
- Public V Private
- Terms of service
- Licensing & Jurisdiction



TECHNICAL ISSUES

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

- Evolving Technical Landscape
- Provider Limitations
- Content Diversity & Volume
- Validated Tools



GENERAL THOUGHTS

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

- Constant Evolution
- Social media Crime on the Rise
- Can we monitor SM?
- “Catch me if you can”
- Increasing Privacy Awareness



DOES SOCIAL MEDIA MATTER

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY



Case Study

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

- **Cameroon Atrocity**
 - Killing of women and children
 - Originally dismissed by the Cameroon Government
 - Forensic Analysis of video by BBC Africa Eye
 - Real-Time Analysis and showed when and where the crime was committed
 - <https://youtu.be/XbnLkc6r3yc?si=etbbyHB7nqFnmSV8>

ACPO GOOD PRACTICE OF DIGITAL EVIDENCE

OSINT – FORENSIC SCIENCE INVESTIGATION

Association of Chief Police Officers

- **Principle 1:** No action taken by law enforcement agencies or their agents should change data held on a computer or storage media which may subsequently be relied upon in court.
- **Principle 2:** In circumstances where a person finds it necessary to access original data held on a computer or on storage media, that person must be competent to do so and be able to give evidence explaining the relevance and the implications of their actions.
- **Principle 3:** An audit trail or other record of all processes applied to computer-based electronic evidence should be created and preserved. An independent third party should be able to examine those processes and achieve the same result.
- **Principle 4:** The person in charge of the investigation (the case officer) has overall responsibility for ensuring that the law and these principles are adhered to.

Lab Session: Basic Tools



GOOGLE HACKING

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

GOOGLE SEARCH



SEARCH OPERATORS

- **Site:** get results from certain sites
- **Related:**
- **OR:**
- **Info:**
- **Cache:**
- **info:**
- **Related:**
- **- , * , “” ,**

OSINT TOOLS

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

DEEP WEB SEARCHING

socialmention*



Find Username Find Email Find Mobile Website Tools Find Forum User

Search for: Username ?

Caroline

Search

topix

EMAIL SHERLOCK



OSINT TOOLS 2

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

IP TOOLS

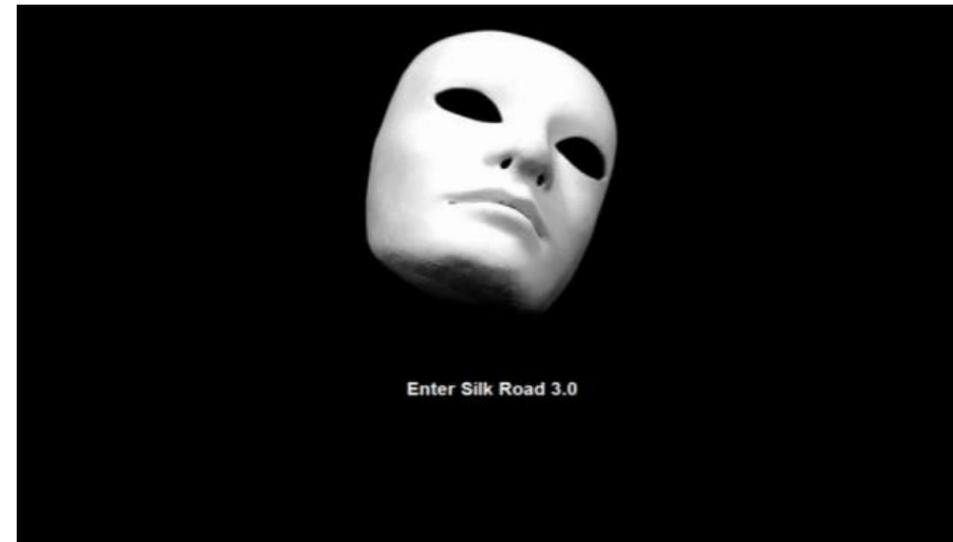
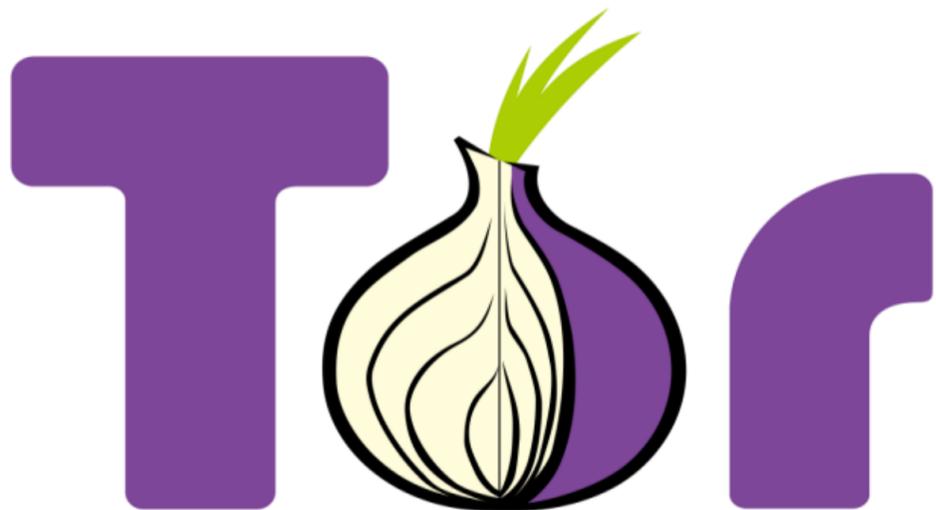
ipTRACKERonline.com
Geo Marketing. IP Address tools and a whole lot more



EMERGING TECH., DARK WEB

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

MASKING TOOLS



OSINT LINKS

OPEN-SOURCE INTELLIGENCE & EXPERT WITNESS TESTIMONY

1. GOOGLE: www.google.com
2. FACEBOOK: www.facebook.com
3. DOGPILE: www.dogpile.com
4. 1MILLION TWEET: <http://onemilliontweetmap.com/>
5. USERSEARCH: <https://usersearch.org/>
6. TOPIX: <http://www.topix.com/>
7. SOCIAL SEARCHER: <https://www.social-searcher.com/>
8. CARROT SEARCH: <http://search.carrot2.org/stable/search>
9. SHODAN: <https://www.shodan.io/>
10. NAMECHECK: <https://namechk.com/>
11. EMAIL SHERLOCK: <http://www.emailsherlock.com/>
12. IP: <http://whatismyipaddress.com/>
13. BIT COIN: <https://bitcoin.org/en/>
14. BLACK PHONE: <https://www.silentcircle.com/products-and-solutions/devices/>
15. TOR PROJECT: <https://www.torproject.org/>
16. HIDE MY ASS: <https://www.hidemyass.com/>
17. SILK ROAD: <http://silkroaddrugs.org/guide-on-how-to-access-the-silk-road-3-0/>
18. IP TRACKER: <http://www.iptrackeronline.com/>
19. **OSINT TOOLS:** <http://www.onstrat.com/osint/>

Expert Witness Testimony

