Data & Network Security

Chapter 2 - Social Issues and Professional Practice

Outline

2.1 Introduction

2.2 Social Context

2.3 Analytical Tools

2.4 Security Awareness

2.5 Ethics, Law and Policies

2.6 Professional Practice

2.7 Intellectual Property

2.8 Privacy and Civil Liberties

Learning Outcome

At the end of this chapter the students able to

- Understand the social issues.

- Explain the social context in Malaysia.

- Explain the concept of security awareness.

- Understand the ethics, laws and policies.

- Understand the professional practice concepts.

- Practice the intellectual property rules.

- Understand the concept of privacy and civil liberties.

Introduction

- **Social Issues** and **Professional Practice** are the issues of Internet usage, the ethics and law that need to be considered.
- **Social issues** – talk about negative effects on a social group or individual such as the digital divide, usage and enemy of the Internet.
- **Professional practice** – talk about activity/ethic/behaviour which will help people apply knowledge to the industry, job role or workplace.

Social Context or E-Access

- e-Access is the acronym for the word "electronic access".

- From Merriam-Webster's Online Dictionary, the word "access" means "the ability to enter", or "pass to or from a place", or "to communicate with a person or thing".

- e-Access is about <u>Understanding the privilege to use electronic information in society as well as the rights to an equitable, secure and reliable access. (In 1Citizen Program, 2013)</u>

Social Context - Digital Divide

- The 2nd World Summit on the Information Society was held from 10-12 December 2003 in Geneva to discuss the issues of digital divide (digital gap) concerning urban and rural areas.

- During the meeting, the United Nations insisted that by 2015 more than half of the world population should have Internet access.
(1Citizen Program,2013)

5.19 billion internet users
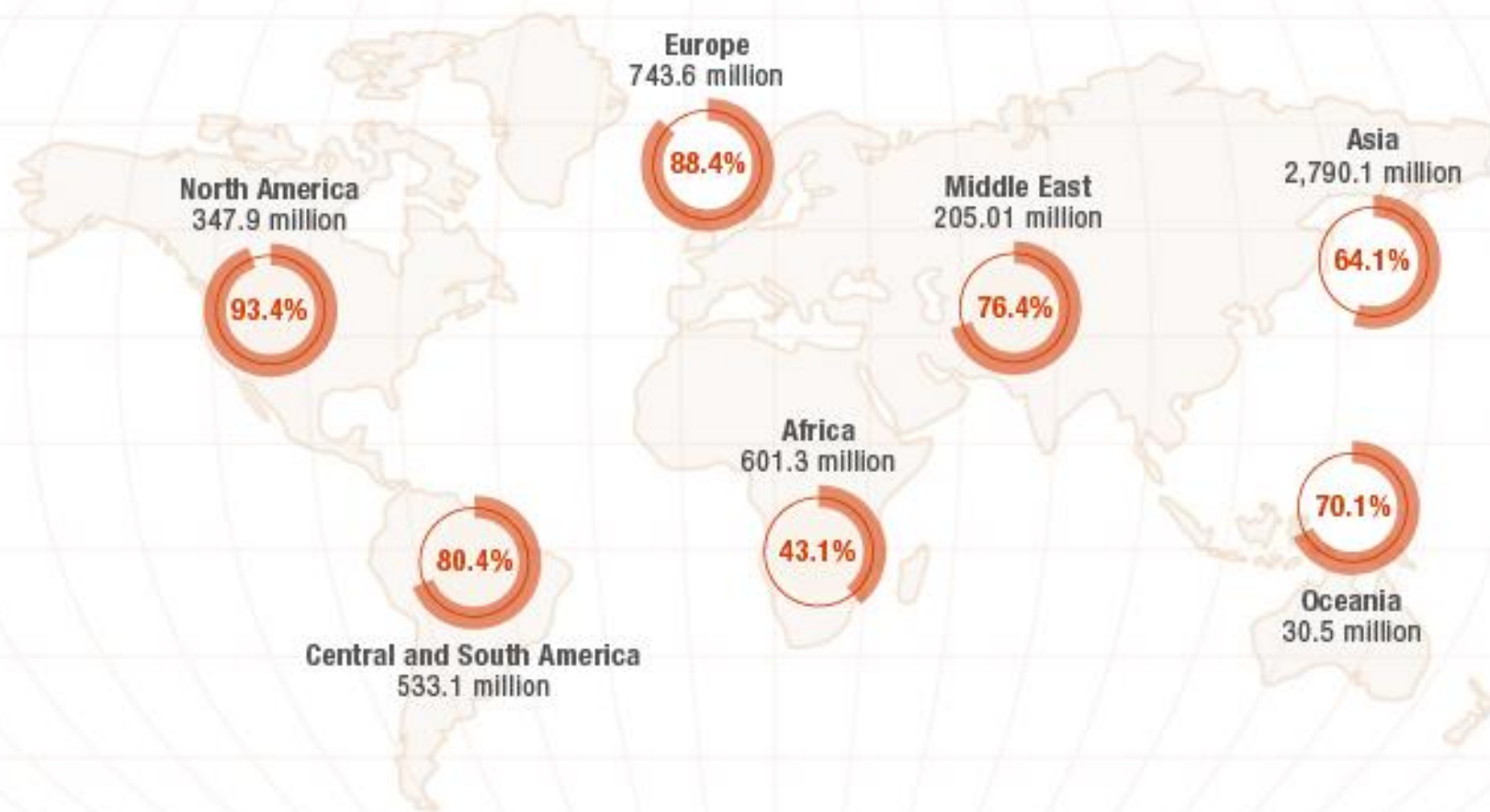
Worldwide digital population 2023

As of July 2023, there were 5.19 billion internet users worldwide, which amounted to 64.6 percent of the global population. Of this total, 4.88 billion, or 59.9 percent of the world's population, were social media users. 22 Sept 2023
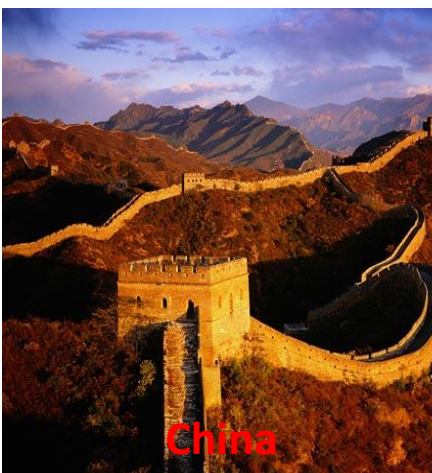
The Internet world map

Discover the number of users and Internet penetration globally*

Europe
743.6 million

88.4%

North America
347.9 million

93.4%

Middle East
205.01 million

76.4%

Asia
2,790.1 million

64.1%

Africa
601.3 million

43.1%

80.4%

70.1%

Oceania
30.5 million

Central and South America
533.1 million

"Enemies of the Internet"

China

Myanmar

Cuba

Iran

North Korea

Egypt

Belarus

- Iran
- North Korea
- Saudi Arabia
- Syria
- Tunisia
- Turkmenistan
- Uzbekistan
- Vietnam

Developed Country vs. Underdeveloped Country

Digital Divide

Countries with the largest digital populations in the world as of January 2023 (in millions) - (Statista, 2023)
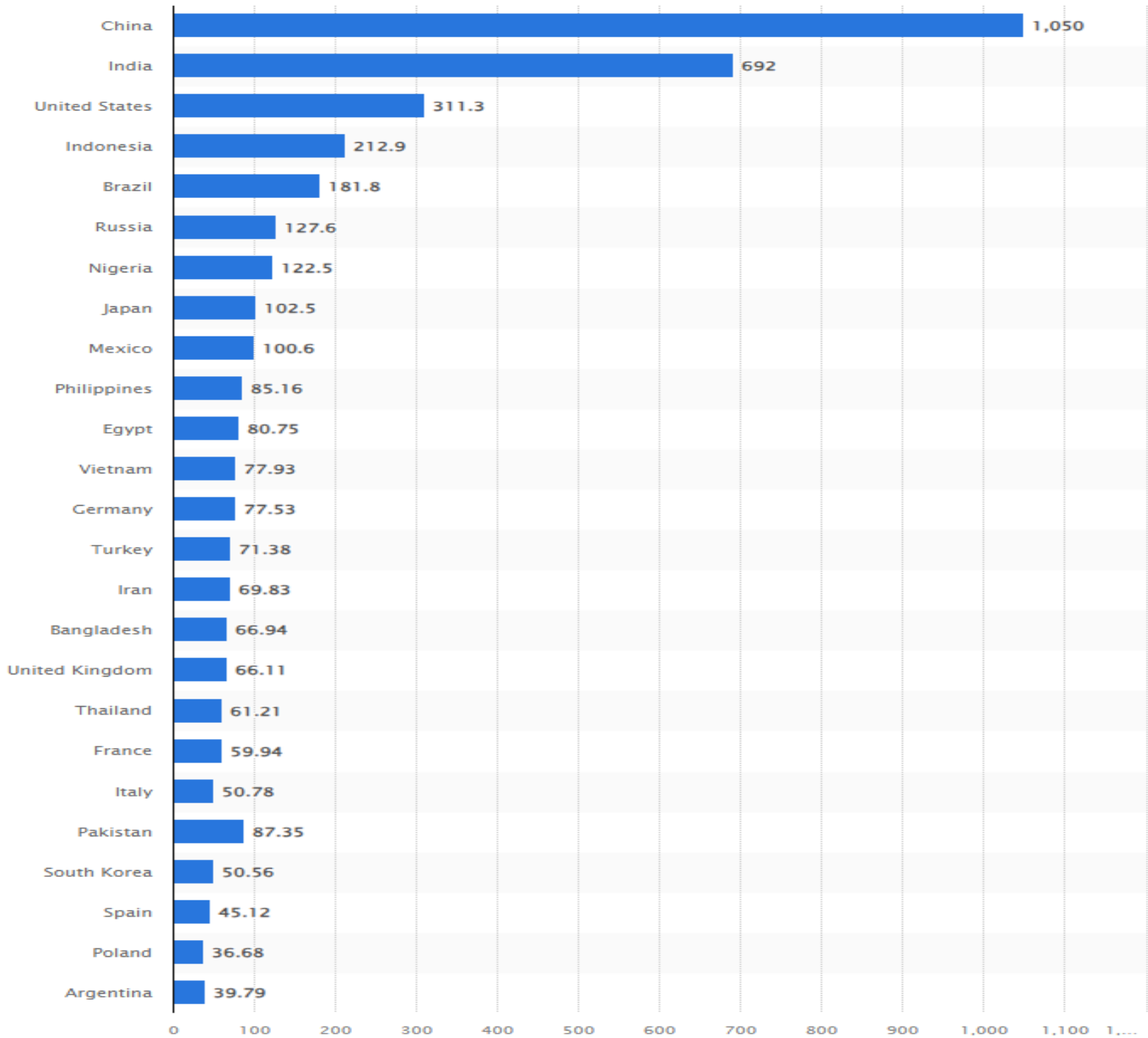
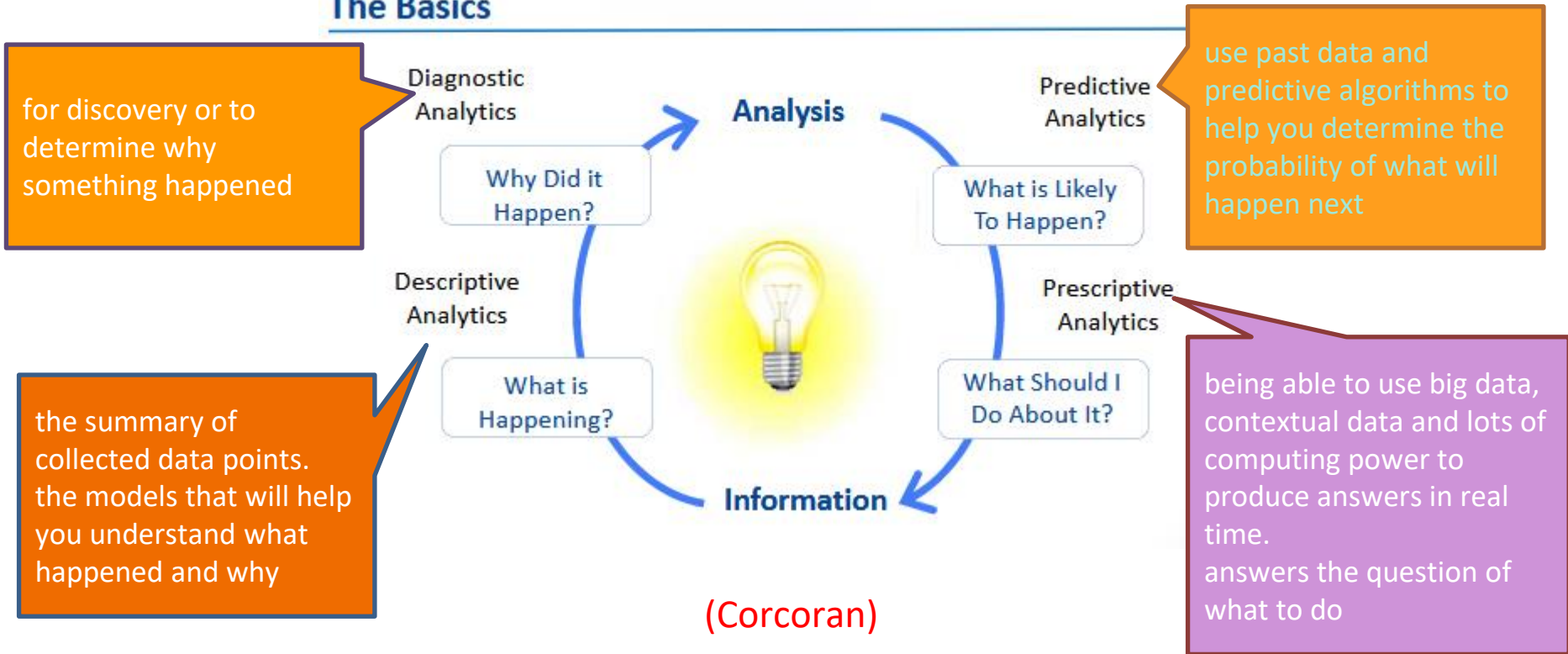| Country	Value
China	1,050
India	692
United States	311.3
Indonesia	212.9
Brazil	181.8
Russia	127.6
Nigeria	122.5
Japan	102.5
Mexico	100.6
Philippines	85.16
Egypt	80.75
Vietnam	77.93
Germany	77.53
Turkey	71.38
Iran	69.83
Bangladesh	66.94
United Kingdom	66.11
Thailand	61.21
France	59.94
Italy	50.78
Pakistan	87.35
South Korea	50.56
Spain	45.12
Poland	36.68
Argentina	39.79

Introduction - Analytical Tools

- Analytics – systematic computational analysis of data.

- Analytics is an encompassing and multidimensional field that uses mathematics, statistics, predictive modelling and machine-learning techniques to find meaningful patterns and knowledge in recorded data.

- Can help businesses increase revenues, improve operational efficiency, optimize marketing campaigns and customer service efforts, respond more quickly to emerging market trends and gain a competitive edge over rivals. (Rouse, M., 2016)

Four Types of Analytics

Information, Analysis And Decisions: The Basics

Diagnostic Analytics

Analysis

Why Did it Happen?

Predictive Analytics

What is Likely To Happen?

Descriptive Analytics

What is Happening?

Prescriptive Analytics

What Should I Do About It?

Information

for discovery or to determine why something happened

use past data and predictive algorithms to help you determine the probability of what will happen next

the summary of collected data points. the models that will help you understand what happened and why

being able to use big data, contextual data and lots of computing power to produce answers in real time. answers the question of what to do

(Corcoran)

Most Popular Analytics Tools in Business

The Best Data Analytics Software of 2023

- **Microsoft Power BI**: Best for data visualization
- **Tableau**: Best for business intelligence (BI)
- **Qlik Sense**: Best for machine learning (ML)
- **Looker**: Best for data exploration
- **Klipfolio**: Best for instant metrics
- **Zoho Analytics**: Best for robust insights
- **Domo**: Best for streamlining workflows
- **Sisense**: Best for integrated analytics solutions
- **Google Analytics**: Best for web traffic insight
- **SAP Analytics Cloud**: Best for enterprise performance management

Top 10 Business Analytics Tools In 2023

Top 10 Business Analytics **Software Tools**

| Tableau | Power BI | Klipfolio | Qlik | Looker |
| Python | Zoho Analytics | Domo | RapidMiner | QuickSight |

Top Companies Using the Most Popular Analytics Tools (Vohra, 2011)

Popular Analytics Tools	Top Companies Using Them
Open Source	
R	Accenture, Cognizant, Google, Facebook, Citibank, Genpact, MuSigma, Fractal Analytics
Python	Alibaba, Google, Cognizant, TCS, Genpact, Gramener
Apache Spark	Uber, Pinterest, Ola, Facebook, Infosys, Wipro, Netflix
Apache Storm	Groupon, Twitter, Yahoo, Alibaba, Spotify, Flipboard
PIG & HIVE	Yahoo, Facebook, Twitter, Baidu, Uber, Flipkart
Commercial	
SAS	HSBC, Citibank, Google, Netflix, WNS, Genpact, Accenture, HDFC
Tableau	Barclays, Citibank, Gallup, Ogilvy, LA Times, Toyota, AOL, Dell, HP, Marico, Ashok Leyland
Excel	Almost every company known to mankind
Qlikview	TCS, Capgemini, Accenture, Cisco, Deloitte, Citibank
Splunk	Adobe, Nasdaq, Coca-Cola, Cognizant, Groupon, First Data, GoodData, ING, Intuit

Analytical Tools

Useful external sites for social media monitoring and analytics (Jack, 2016):-

- Social Mention
- Tweet Deck
- Hootsuite
- Twilert
- Sprout Social
- Social Oomph
- Sysomos
- Brand Monitor
- Google Analytics
- Google Alerts

Security Awareness

Awareness: A Definition

Awareness is the "**what**" component of the education strategy of an organization which tries to change the behaviour and patterns.
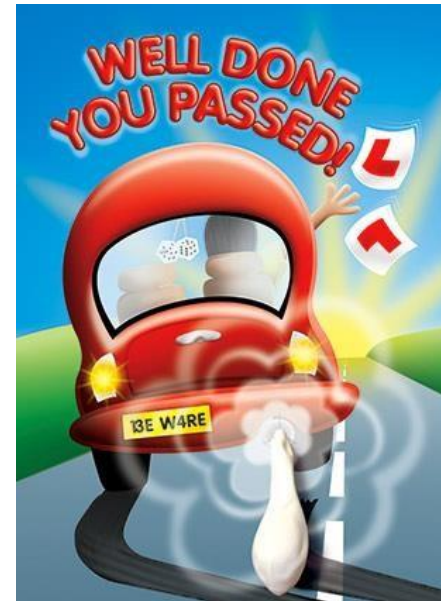
Awareness vs Training

- Awareness is not training.

- The purpose of awareness is simply to focus attention on security.

- Awareness is intended to allow individuals to recognize information security concerns and respond accordingly.

- Awareness relies on reaching broad audiences with creative packaging techniques.

- Training is one of the "**how**" components to implement security.

- Training is more formal, having a goal of building knowledge and skills to facilitate the job performance.

Education

Training
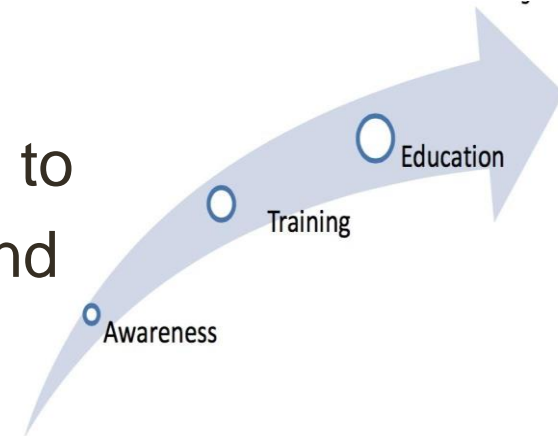
Awareness

Awareness vs Behaviour

Example of Awareness

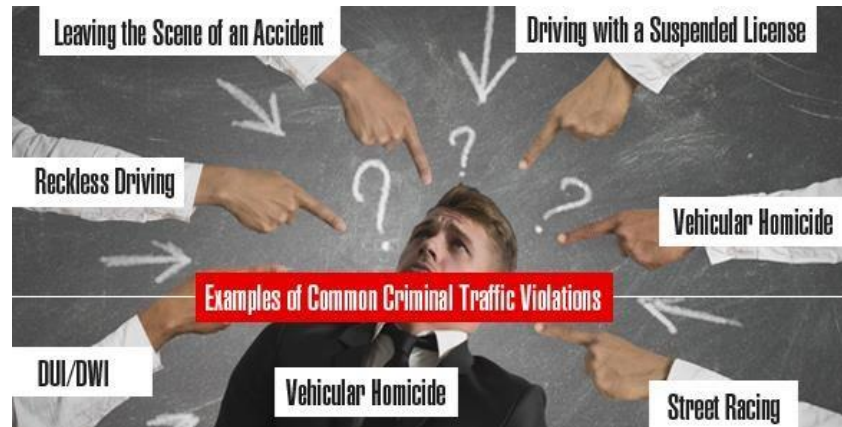*"I passed the driving test and so I know the driving rules "*

Awareness vs Behaviour

Example of Behaviour:

Does that make you a safe driver?

Examples of Common Criminal Traffic Violations: Leaving the Scene of an Accident, Driving with a Suspended License, Reckless Driving, Vehicular Homicide, DUI/DWI, Vehicular Homicide, Street Racing

Awareness vs Behaviour

Awareness	⟷	I Know
Behaviour	⟷	I Do
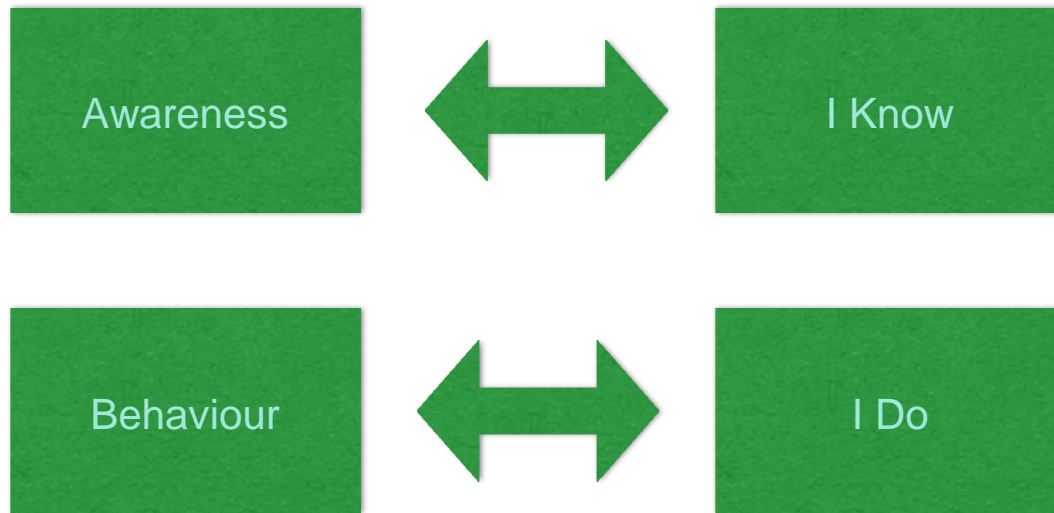
Behaviour = Practice / Competence

Case Study: Problem Analysis

Visibility and Clarity

When you have too many rules, it gets complicated

Analyze this...

It's our 10th anniversary & the wife is so happy with the diamond ring #habib #anniversary #ilovemywife

Analyze this...

Do you know who your child's online friends are?

Analyze this...

Are you aware of your surroundings when accessing company sensitive information?

Analyze this...

Shred all papers that contain sensitive information before disposing

Analyze this...

Hi,
I run a Windows 2008 Server, Service Pack 1.0, with MS SQL 2008 for my external web apps. I am having a
problem with …… and I have installed patch 1.2.3.
Can someone help me?

So Why Do People Make Such Mistakes?

Lack of awareness

They think it is safe (perception)
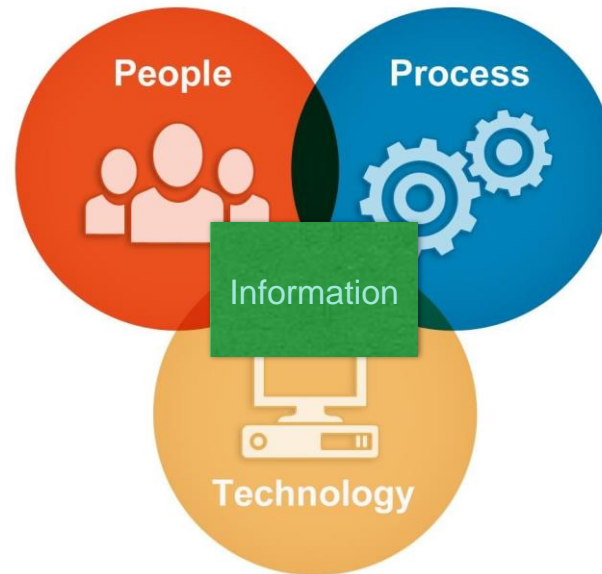
Poor attitude / behaviour

Let's Have a Debate

Humans will always fail. Let us focus on getting fail-proof technology.

Technology will always fail. Let us focus on getting humans fail-proof.

Technology, Process & People

Technology and process just as good as the people who use them

So, What Are We Going to Do?

1. Make users "**trust**" information security as a valuable and

   useful business requirement

2. Make users "**trust**" the information security team

3. Make users "**behave responsibly**" with information

How will you do it?

Through a powerful information security awareness and behaviour management program

Ethics, Law & Policies

Ethics - (Gao, 2009)

- Ethics in general:
  - the set of beliefs about right and wrong behaviour
- Ethics in business:
  - is becoming more important because the risks associated with inappropriate behaviour have grown in number, complexity, likelihood and significance
  - corporations want to protect themselves and their employees from legal action
- Ethics in information technology (should or not?)
  - email and Internet access monitoring by employers
  - peer-to-peer networks used for music downloads imply violation of copyright laws
  - unsolicited e-mail (spam)
  - hackers breaking into databases of financial institutions can result in identity theft
  - students downloading material from the web can result in plagiarism on term papers
  - web sites plant cookies or spyware on visitors' hard drives to track their Internet activity

Law and Ethics in Information Security

- Laws: rules that mandate or prohibit certain societal behaviour

- Ethics: define socially acceptable behaviour

- Laws carry sanctions of a governing authority; ethics do not

- Cultural mores: fixed moral attitudes or customs of a particular group; ethics are based on these

LAW
VERSUS
ETHICS

LAW	ETHICS
A set of rules and regulations created and enforced by the administrative authority of a society/country with the intention of regulating human behaviour for the common good	The moral principles that govern a person's behaviour or the conducting of an activity
Purpose is to create an orderly society devoid of evil and injustice	Purpose is to create morally right people in society
Those who break the law will get punished	Those who go against rules will be socially isolated

Ethics and Information Security

The Ten Commandments of Computer Ethics[6]

From The Computer Ethics Institute

1. Thou shalt not use a computer to harm other people.
2. Thou shalt not interfere with other people's computer work.
3. Thou shalt not snoop around in other people's computer files.
4. Thou shalt not use a computer to steal.
5. Thou shalt not use a computer to bear false witness.
6. Thou shalt not copy or use proprietary software for which you have not paid.
7. Thou shalt not use other people's computer resources without authorization or proper compensation.
8. Thou shalt not appropriate other people's intellectual output.
9. Thou shalt think about the social consequences of the program you are writing or the system you are designing.
10. Thou shalt always use a computer in ways that ensure consideration and respect for your fellow humans.

Ethical Differences Across Cultures

- Cultural differences create difficulty in determining what is and is not ethical.

- Difficulties arise when one nationality's ethical behaviour conflicts with the ethics of another national group.

- Example: many of the ways in which Asian cultures use computer technology are considered software piracy by other nations.

Ethics and Education

- The overriding factor in levelling ethical perceptions within a small population is education.

- Employees must be trained in the expected behaviours of an ethical employee, especially in areas of information security.

- Proper ethical training is vital to creating informed, well-prepared, and low-risk system users.

Continue...

- **Liability**: legal obligation of an entity extending beyond criminal or contract law; includes legal obligation to make restitution.

- **Restitution**: to compensate for wrongs committed by an organization or its employees.

- **Due care**: ensuring that employees know what constitutes acceptable behaviour and know the consequences of illegal or unethical actions.

- **Due diligence**: making a valid effort to protect others; continually maintaining a level of effort.

Codes of Ethics and Professional Organizations

- Several professional organizations have established codes of conduct/ethics.

- Codes of ethics can have a positive effect; unfortunately, many employers do not encourage joining these professional organizations.

- It is the responsibility of security professionals to act ethically and according to the policies of the employer, professional organizations, and laws of society.

Professional Organizations with Codes of Ethics

- Association of Computing Machinery (ACM)

- International Information Systems Security Certification Consortium, Inc. (ISC)[2]

- System Administration, Networking, and Security Institute (SANS)

- Information Systems Audit and Control Association (ISACA)

- Information Systems Security Association (ISSA)

Code of Ethics

The Code of Ethics for information security professionals is derived from Unified Framework for Information Security Professionals which emphasized on 3 core ethic **values; Integrity, Objectivity and Professional Competence** & **Due Care** which required all members to observe:

VALUES	DESCRIPTIONS
Integrity	• Perform duties in accordance with existing laws and exercising the highest moral principles • Refrain from activities that would constitute a conflict of interest • Act in the best interests of stakeholders consistent with public interest • Act honorably, justly, responsibly, and legally in every aspect of your profession
Objectivity	• Perform all duties in fair manner and without prejudice • Exercise independent professional judgment, in order to provide unbiased analysis and advice • When an opinion is provided, note it as opinion rather than fact

Continues…

VALUES	DESCRIPTIONS
Professional competence and due care	- Perform services diligently and professionally - Act with diligence and promptness in rendering service - Render only those services which you are fully competent and qualified - Ensure that work performed meets the highest professional standards. Where constraints exist, ensure that your work is both correct and complete within those limits. If, in your professional judgment, resources are inadequate to achieve an acceptable outcome, so inform clients and principals - Be supportive of colleagues, and encourage their professional development. Recognize and acknowledge the contributions of others, and respect the decisions of principals and co-workers - Keep stakeholders informed regarding the progress of your work - Refrain from conduct which would damage the reputation of the profession, or the practice of colleagues, clients, and employers - Report ethical violations to the appropriate governing body in a timely manner

Policy versus Law

- Policies: a body of expectations that describe acceptable and unacceptable employee behaviours in the workplace.

- Policies function as laws within an organization; must be crafted carefully to ensure they are complete, appropriate, and fairly applied to everyone.

- Difference between policy and law: ignorance of a policy is an acceptable defence.

- Criteria for policy enforcement: dissemination (distribution), review (reading), comprehension (understanding), compliance (agreement), and uniform enforcement.

Policy versus Law

"**Policy** is the outline of what a government is going to do and what it can achieve for the society. Policy also means what a government does not intend to do. It also evolves the principles that are needed for achieving the goal. Policies are only documents and not law, but these policies can lead to new laws."

"**Laws** are set standards, principles, and procedures that must be followed in society. Law is mainly made for implementing justice in the society. There are various types of laws framed like criminal laws, civil laws, and international laws. While a law is framed for bringing justice to the society, a policy is framed for achieving certain goals."

General Computer Crime Laws (US. and Malaysia)

- Computer Fraud and Abuse Act of 1986 (CFA Act)

- Computer Security Act of 1987

- National Information Infrastructure Protection Act of 1996

- USA PATRIOT Act of 2001

- USA PATRIOT Improvement and Reauthorization Act

- Malaysia law........

MALAYSIAN CYBER LAWS

Copyright (Amendment) Act 1997

Computer Crimes Act 1997

Digital Signature Act 1997

Telemedicine Act 1997

Communications and Multimedia Act 1998

Electronic Commerce Act 2006

Electronic Government Activities Act 2007

Personal Data Protection Act 2010

Penal Code

Anti-Fake News (Repeal) Act 2020

https://www.nacsa.gov.my/legal.php

Professional Practices, IP, Privacy & Civil Liberties

Professional Practice- (Woo, 2017)

- IT professionals are responsible to act in an ethical manner in the performance of our work duties or else risks losing the trust of our students, faculty, staff, communities, and the general public

Professional Practice - (Woo, 2017)

- Elements that describe ethical behaviour in the profession, in general, these codes assert that IT professionals need to commit to:
  - Integrity
  - Competence
  - Professional responsibilities
  - Work responsibilities
  - Societal responsibilities

Deterrence to Unethical and Illegal Behaviour

- Three general causes of unethical and illegal behaviour: ignorance, accident, intent

- Deterrence: best method for preventing an illegal or unethical activity; e.g., laws, policies, technical controls

- Laws, policies, and controls only deter if three conditions are present:
    - Fear of penalty
    - Probability of being caught
    - Probability of penalty being administered

Intellectual Property - (World Intellectual Property Organization)

- Refers to creations of the mind: inventions; literary and artistic works; and symbols, names and images used in commerce.
- Intellectual property is divided into two categories:
  - Industrial Property
    - Includes patents for inventions, trademarks, industrial designs and geographical indications.
  - Copyright
    - covers literary works (such as novels, poems and plays), films, music, artistic works (e.g., drawings, paintings, photographs and sculptures) and architectural design.
    - Rights related to copyright include those of performing artists in their performances, producers of phonograms in their recordings, and broadcasters in their radio and television programs

Privacy

- One of the hottest topics in information security.

- Privacy is a "state of being free from unsanctioned intrusion".

- The ability to aggregate data from multiple sources allows the creation of information databases previously impossible.

- The number of statutes addressing an individual's right to privacy has grown.

Privacy of Customer Information

- Privacy of Customer Information Section of the common carrier regulation

- Federal Privacy Act of 1974

- Electronic Communications Privacy Act of 1986

- Health Insurance Portability and Accountability Act of 1996 (HIPAA), aka Kennedy-Kassebaum Act

- Financial Services Modernization Act, or Gramm-Leach-Bliley Act of 1999

Privacy and Civil Liberties

- Privacy – we can look at a major concern of users. Which can be divided into three:

  - What personal information can be shared with whom
  - Whether messages can be exchanged without anyone else seeing them
  - Whether and how one can send messages anonymously

Privacy and Civil Liberties - (FindLaw)

- Civil Rights concern the basic right to be free from unequal treatment based on certain protected characteristics in settings.
- Civil liberties - typically include basic rights and freedoms that are guaranteed by law.
- Civil liberties include:
  - The right to free speech
  - The right to privacy
  - The right to remain silent in a police interrogation
  - The right to be free from unreasonable searches of your home
  - The right to a fair court trial
  - The right to marry
  - The right to vote

Conclusion

- The growth of internet usage – digital divider.
- Analytic tools – become important to analyze large digital data into predictions, reports, summaries and diagnoses.
- Law vs Ethics and Professional Ethics.
- The idea needs to be protected – industry properties or copyright.
- The global communities need to be protected based on privacy and civil liberties.

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