

Is your data safe, really?

Tsitsi Madzingira

Introduction

- Background
- Work Experience



Topics today

- Industrial Revolutions
- Fourth Industrial Revolution
- Emerging Technologies
- Privacy and Security
- Opportunities for Internal Auditors

Industrial Revolutions

It was the best of times, it was the worst of times-Charles Dickens

1st Industrial Revolution: 1760s-1830s

- From hand tools to basic machines
- Textile manufacturing and steam power
- Increased manufactured goods



2nd Industrial Revolution: 1870s-1910s

- Expansion of electricity, petroleum and steel
- Replacing older products
- Production line technology
- Communication improvements



3rd Industrial Revolution: 1970s

- Computers and automation
- Internet technology and renewable energies
- Electronics and information used to automate production and processes



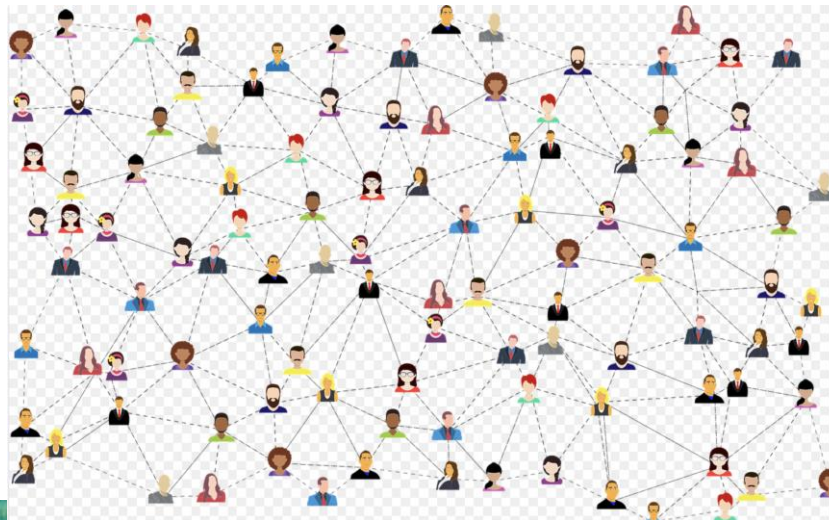
4th Industrial Revolution: current

- Unprecedented pace of change



Fourth Industrial Revolution

- Society and the physical environment
- Impact on business
- Disruption of traditional industry structures
- Endless possibilities with emerging technologies



Artificial Intelligence (AI)

AI is described as '*the intelligence of machines*'. AI processes include learning, reasoning and self correction

Advantages

- Reduction in error and greater precision
- Enhances work efficiency
- Can be used in performing repetitive and time consuming tasks

Challenges

- Ethics around the recreation of intelligence
- If control of machines go in the wrong hands
- Cost of maintenance and repair



Machine Learning

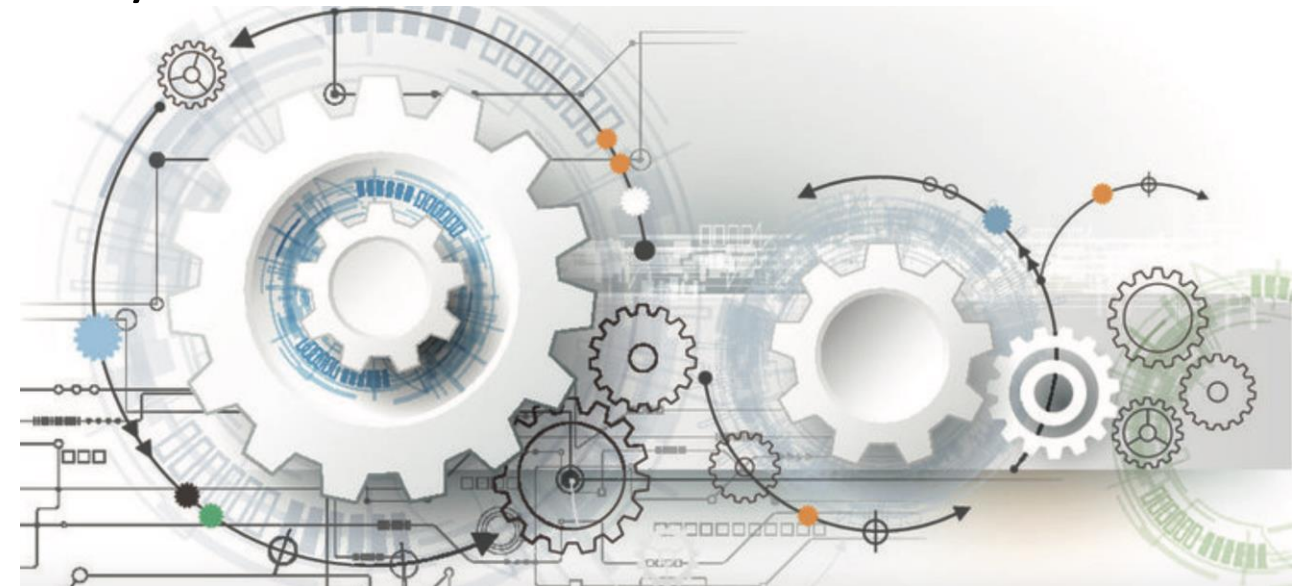
Machine learning is the scientific study of algorithms and statistical models that computer systems use to perform specific tasks without using explicit programming.

Advantages:

- Handling multi-dimensional and multi-variety data
- Continuous improvement
- Solves problems and makes predictions

Challenges:

- Data Acquisition challenge
- Time and Resources
- Susceptible to significant errors



Biotechnology

The exploitation of biological processes to help improve our lives and the health of the planet. Includes genetic manipulation of microorganisms for the production of antibiotics, hormones, etc

Advantages:

- Improves health and reduces hunger
- Offers flexibility within the food chain
- Can reduce infectious disease rates

Challenges:

- Creates an all-or-nothing approach
- Many unknowns in the field of research
- Could be used for destruction



Internet of Things

The Internet of Things is the extension of internet connectivity into physical devices and everyday objects.

Advantages

- Automation and Control
- Improved communication
- Time and money saving

Challenges:

- Compatibility with other devices
- Complexity of network
- Privacy/Security risks if not encrypted



Autonomous Vehicles

An autonomous vehicle is, a vehicle that can guide itself without human conduction

Advantages

- Decreased number of accidents
- Less traffic jams
- Accessibility to transportation

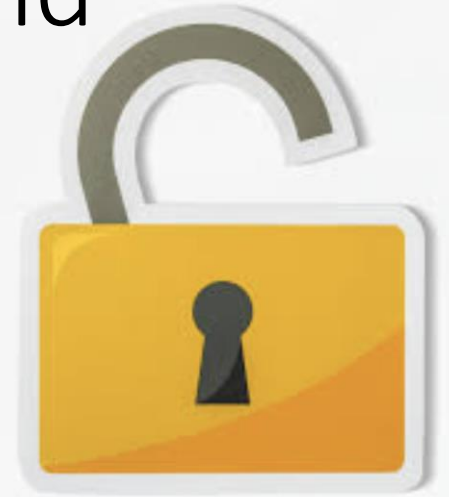
Challenges:

- Expensive
- Safety and security concerns
- Non-functional sensors



Privacy during the revolution and beyond

- Privacy before 3rd industrial revolution
- Organisations collect more personal data
- Personal information is not disclosed to other 3rd parties
- Facebook data use by Cambridge Analytica for political advertising
- Facebook announcement to improve privacy policies in favour of users



Examples of Data Breaches in the last decade



General Data Protection Regulation

Came into effect may 2018. Scope covers EU entities and citizens

- Collect with consent
- Accurate data-right to data portability
- Used for purpose it was originally collected for
- Not retained for longer than necessary
- Measures are taken to protect it
- Notify victims in event of a breach

California, Brazil, Australia, Japan, Thailand



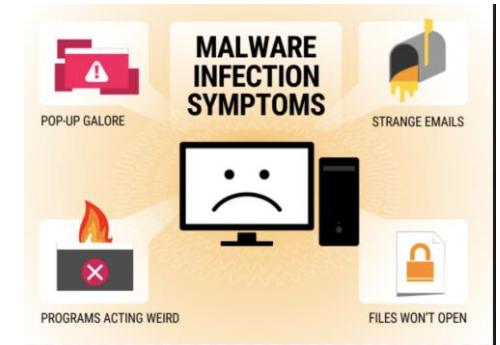
Protecting data and information

- Who/what are we protecting our data and information from?
- Why would anyone want our data and information?
- *'There are two types of companies: those that have been hacked and those that don't know that they have been hacked'* Former Cisco CEO, John Chambers
- Security is a set of controls to protect



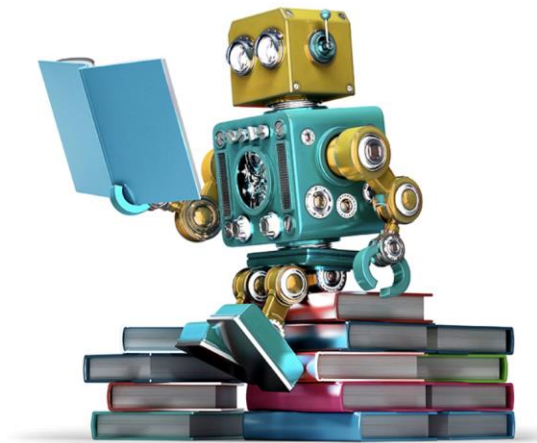
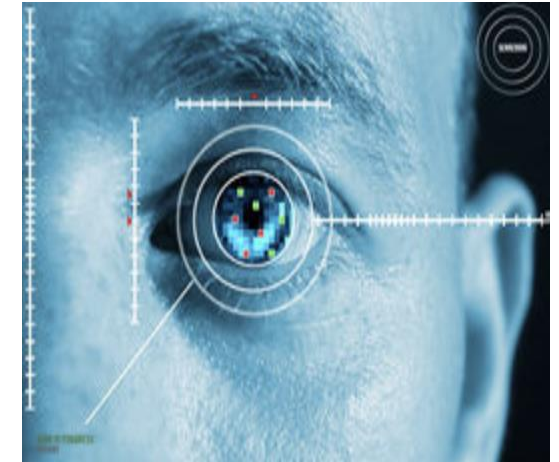
Traditional Information Security

- **Types of attacks:** phishing, denial of service, password, eavesdropping, malware attacks
- **Security measures:** training and awareness, firewalls, patching, blackhole filtering, strong password policy and account lockout policies, data encryption, regular backups and regular system or anti-virus updates
- New technologies, new security considerations

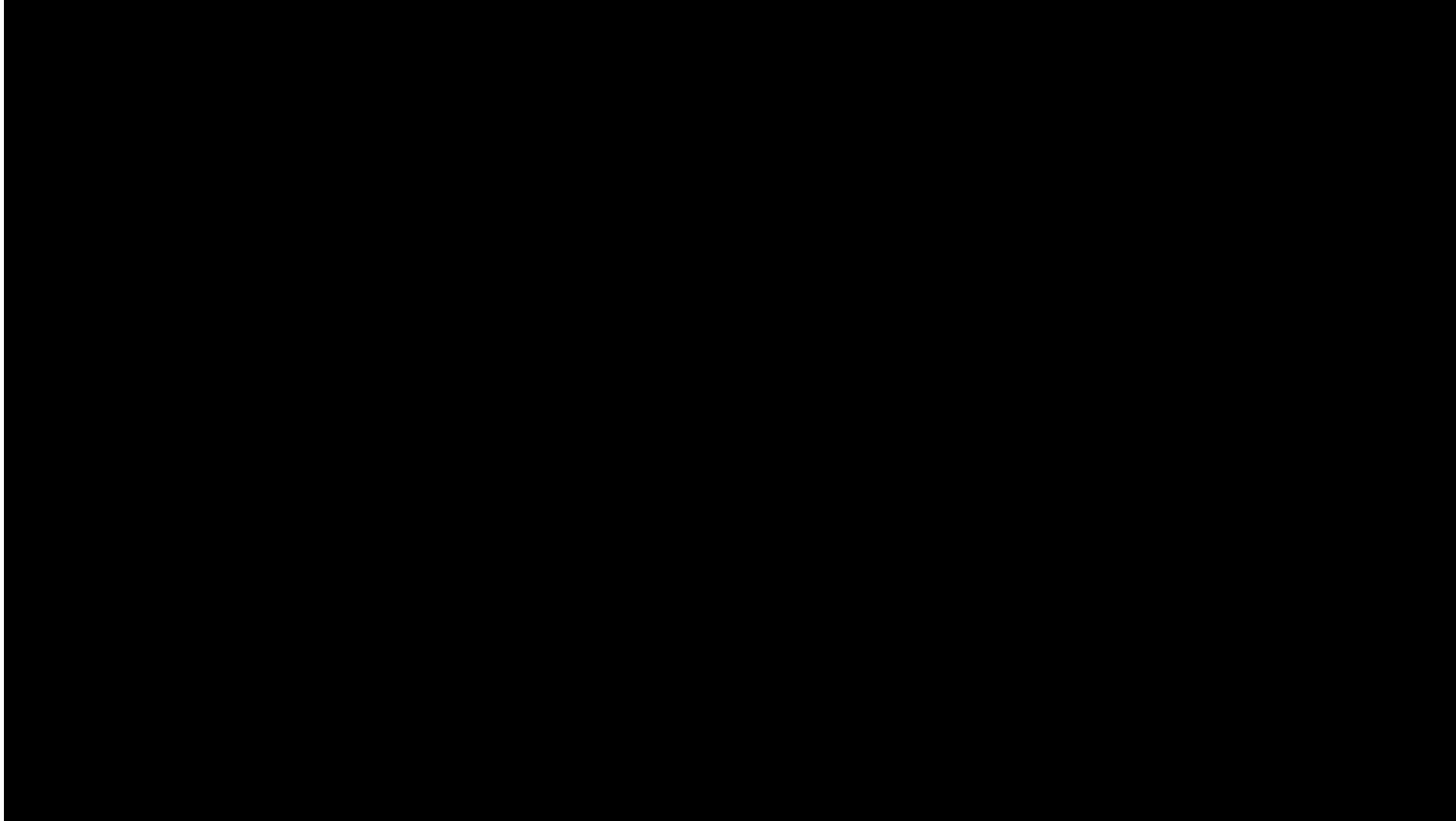


Emerging technologies in security

- Hardware authentication
- User behavior analytics
- Deep Learning



Video by Gerd Leonhard



- From digitization to innovation based on combinations of technology
- Opportunities for individuals and organisations
- Understand the changing environment, and continuously innovate
- Largest beneficiaries of the changes
- Remember to be mindful of the risks
- We are all responsible for guiding this evolution by the decisions we make as citizens, consumers, professionals and investors.



Opportunities for Internal Auditors

- Keep up with technological developments
- Question your organization's security teams
- Make new friends
- Engage in business strategy into new technologies
- Encourage a more security conscious culture

