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# Professional Ethics and Transformative Technology.

**Garth Sheriff, CPA, CA, CIA, MAcc**
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# Professional Ethics and Transformative Technology.

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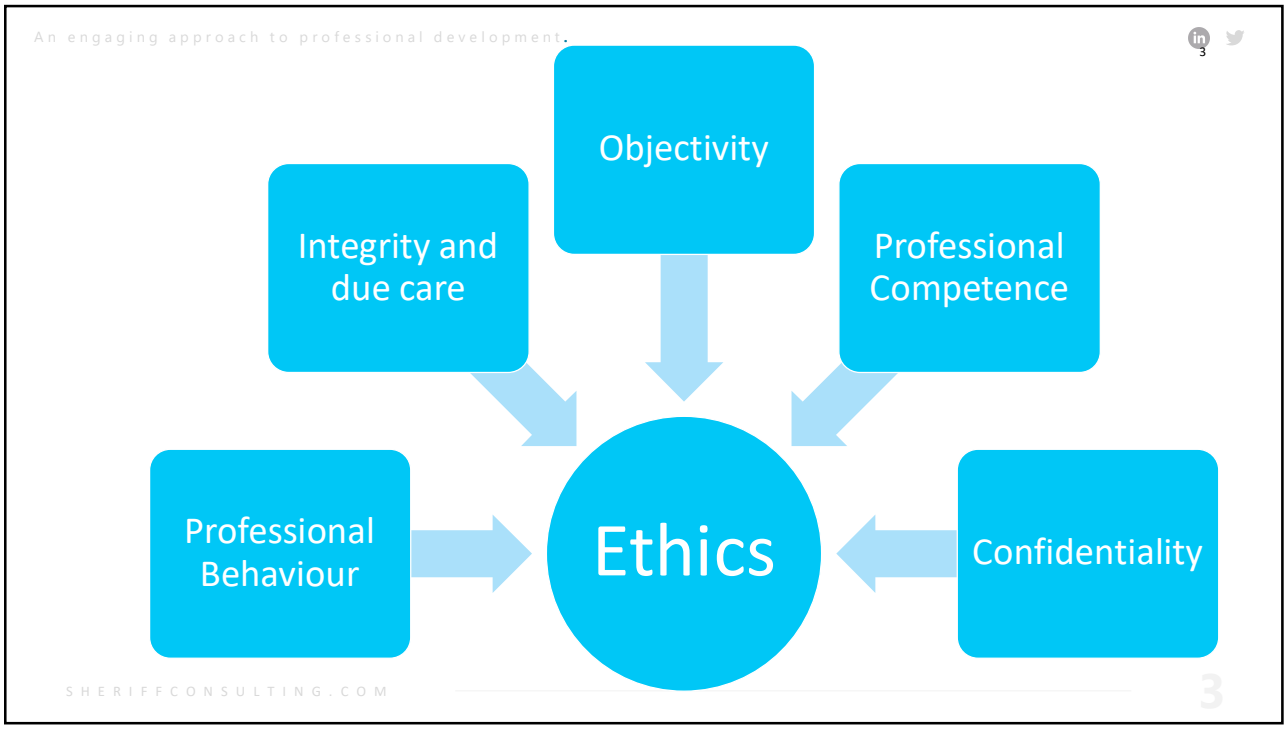
An engaging approach to professional development.
Objectivity
Integrity and due care
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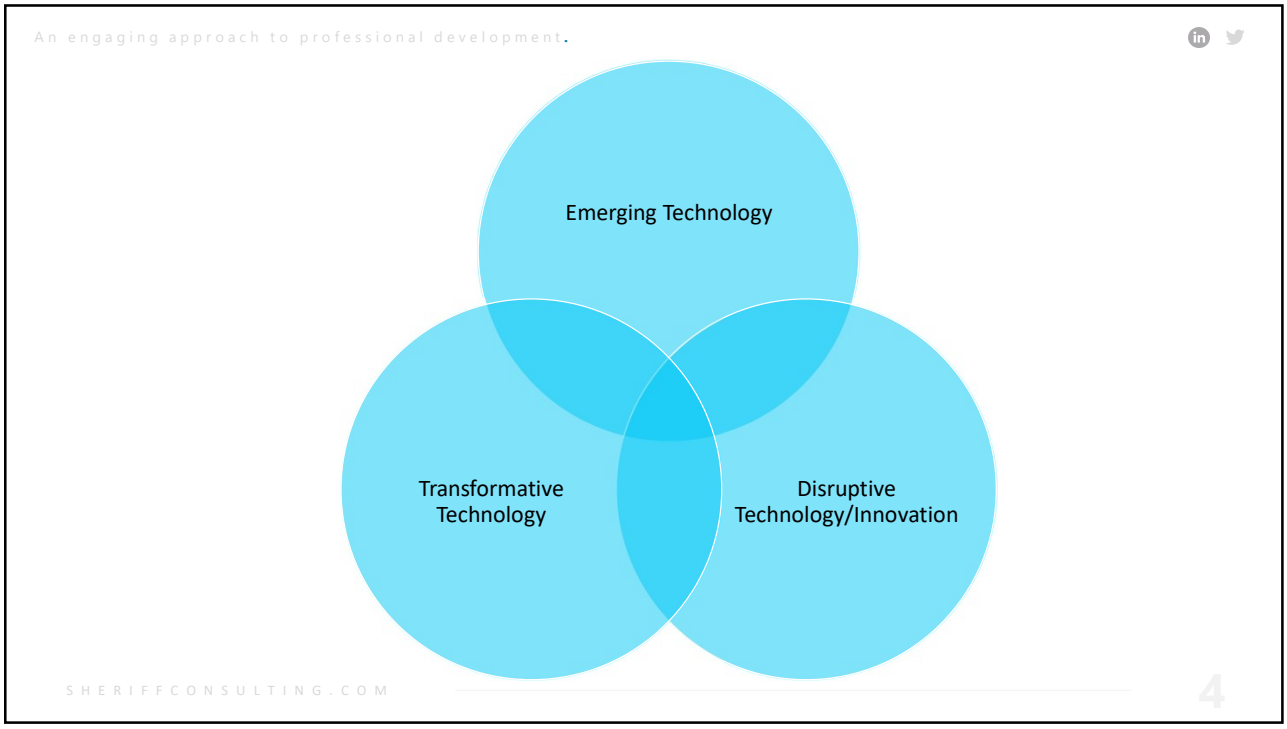
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Emerging Technology
Transformative Technology
Disruptive Technology/Innovation
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## Emerging Technology

Emerging technologies are technologies whose development, practical applications, or both are still largely unrealized, such that they are figuratively emerging into prominence from a background of nonexistence or obscurity.



5



## Disruptive Technology

A new technology that completely changes the way things are done. A disruptive technology overturns a traditional business model, which makes it much harder for an established firm to embrace.



6

## Disruptive Innovation

Disruptive innovation describes a process by which a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up market, eventually displacing established competitors.



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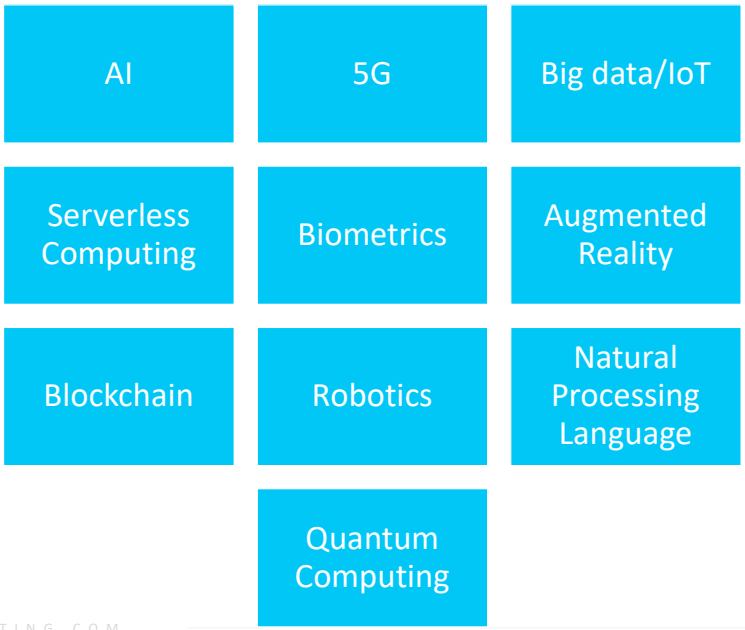
## Transformative Technology

Technology that fundamentally changes our interaction with each **other and information**.

(positively)



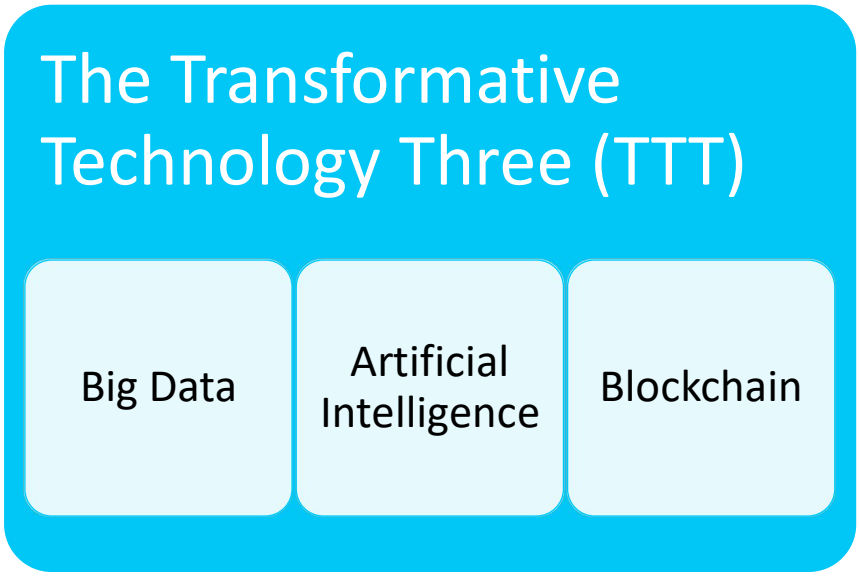
8


AI
5G
Big data/IoT
Serverless Computing
Biometrics
Augmented Reality
Blockchain
Robotics
Natural Processing Language
Quantum Computing



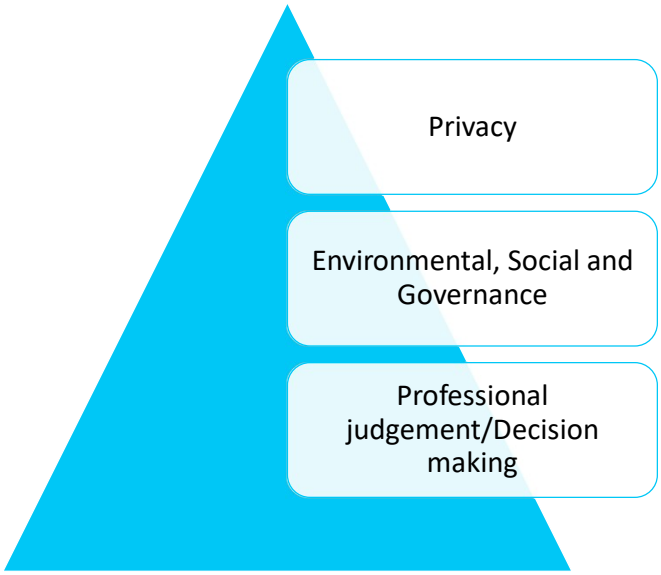
9




The Transformative Technology Three (TTT)
Big Data
Artificial Intelligence
Blockchain



10






11



## PROFESSIONAL ETHICS AND TRANSFORMATIONAL TECHNOLOGY

| | PRIVACY | ESG | PROFESSIONAL JUDGEMENT |
|---|---|---|---|
| BIG DATA | ✖ | | |
| ARTIFICIAL INTELLIGENCE | | ✖ | ✖ |
| BLOCKCHAIN | | ✖ | ✖ |



12

Introduction

The Transformative Technology Three (TTT) Overview – Part 1

The TTT Overview– Part 2

The TTT Overview– Part 3

Privacy and the TTT

ESG and the TTT

Professional Judgement and the TTT

So What for CPAs? – Safeguards for Ethical Decision Making

Conclusion: SMART goals



13



# The Transformative Technology Three (TTT) – Overview



14

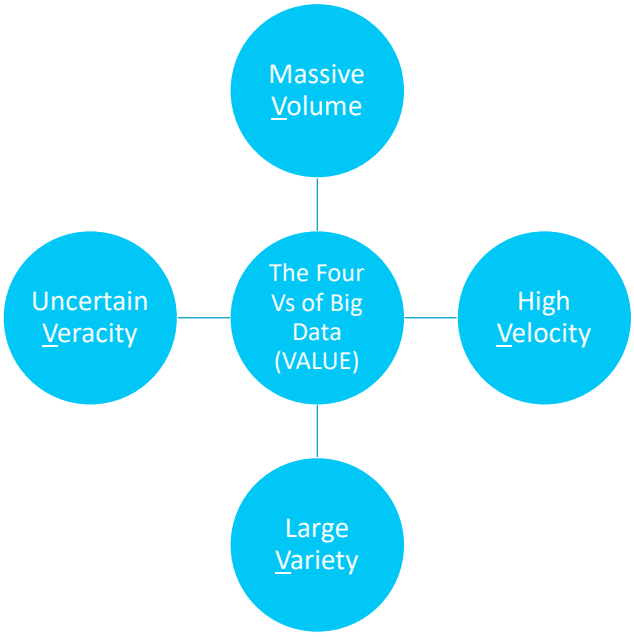
# The Transformative Technology Three (TTT)

| Big Data | Artificial Intelligence | Blockchain |
|---|---|---|



15

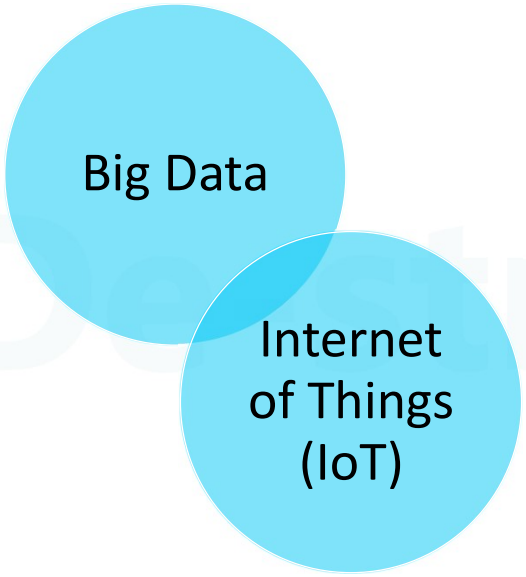

16


Massive Volume
Uncertain Veracity
The Four Vs of Big Data (VALUE)
High Velocity
Large Variety



17




Big Data
Internet of Things (IoT)



18

## The Internet of Things

"Simply, the Internet of Things is made up of devices – from simple sensors to smartphones and wearables – connected together,"

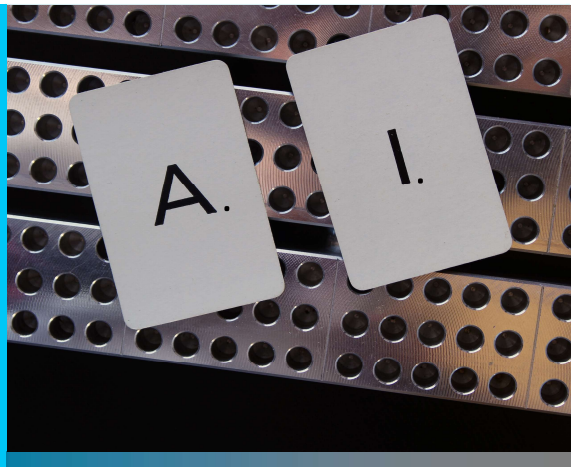
Matthew Evans, the IoT programme head at techUK



19



## Transformative Technology Three (TTT) – Part 2



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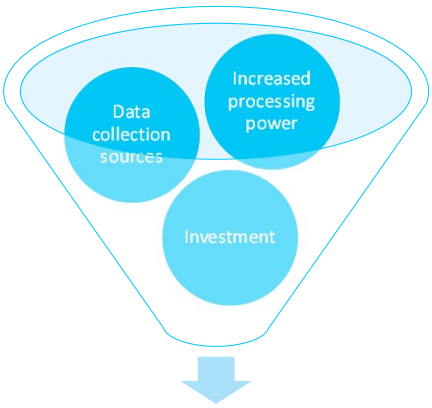
21



Science fiction




Reality



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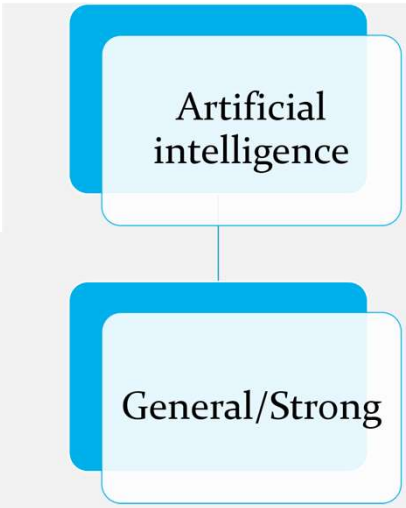


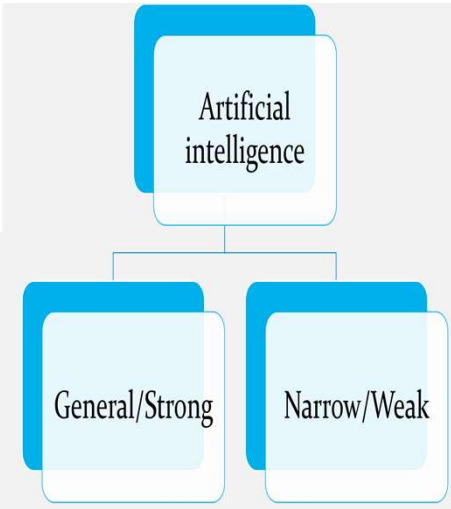

## Strong AI

Strong AI is a term used to describe a certain mindset of artificial intelligence development. Strong AI's goal is to develop artificial intelligence to the point where the machine's intellectual capability is functionally equal to a human's



23



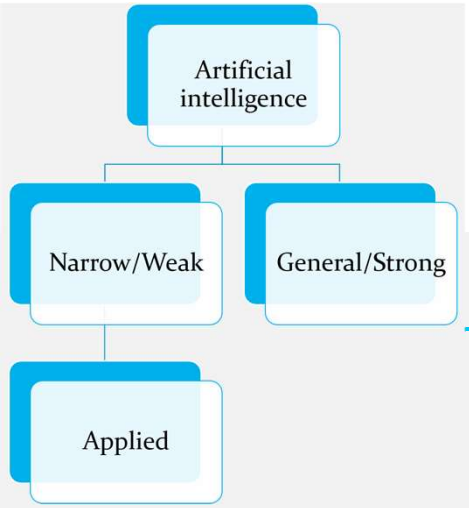



## Weak AI

Artificial Narrow Intelligence (ANI) also known as “Weak” AI is the AI that exists in our world today. Narrow AI is AI that is programmed to perform a single task — whether it’s checking the weather, being able to play chess, or analyzing raw data to write journalistic reports.



24




# Applied AI

- The branch of **artificial intelligence** that brings it out of the lab and into the real world, enabling computers and computer-controlled robots to execute real tasks.



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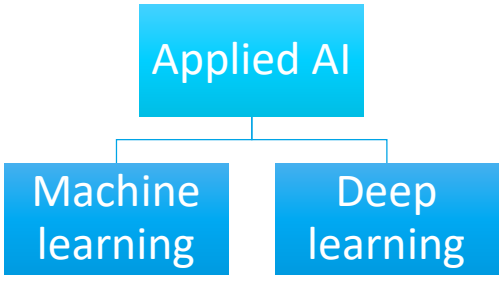





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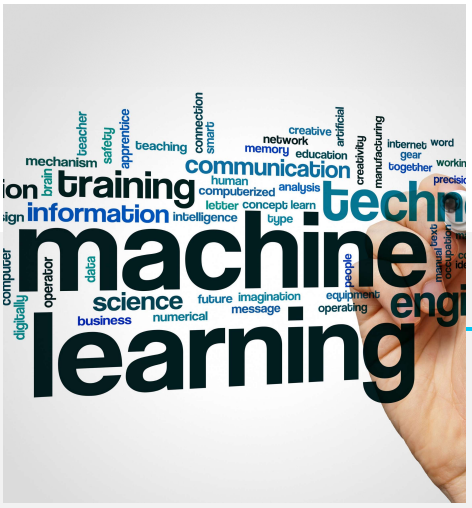



# Machine Learning

The scientific study of algorithms and statistical models that computer systems use in order to perform a specific task effectively without using explicit instructions, relying on patterns and inference instead. It is seen as a subset of artificial intelligence



27



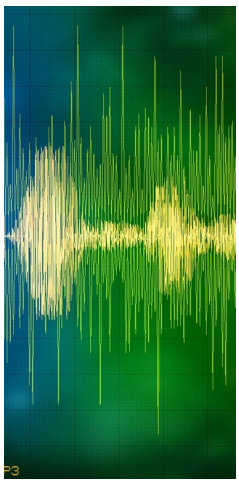

# Deep Learning

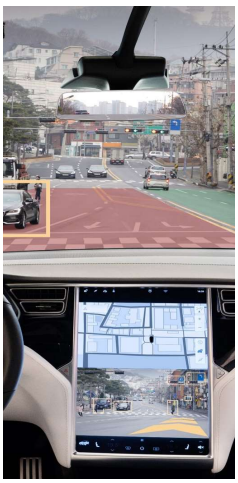
The field of artificial intelligence is essentially when machines can do tasks that typically require human intelligence. It encompasses machine learning, where machines can learn by experience and acquire skills without human involvement.

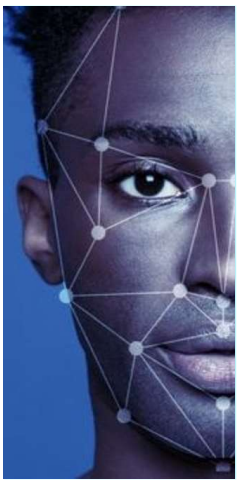
Deep learning is a subset of machine learning where artificial neural networks, algorithms inspired by the human brain, learn from large amounts of data.



28







# Deep Learning

- Voice recognition
  Autonomous cars
  Facial recognition



29



# Transformative Technology Three (TTT) – Part 3




30

# Blockchain definition - Wikipedia

- A **blockchain**,[1][2][3] originally **block chain**,[4][5] is a growing list of records, called *blocks*, which are linked using cryptography.[1][6] Each block contains a cryptographic hash of the previous block,[6] a timestamp, and transaction data (generally represented as a merkle tree root hash).
- By design, a blockchain is resistant to modification of the data. It is "an open, distributed ledger that can record transactions between two parties efficiently and in a verifiable and permanent way".[7] For use as a distributed ledger, a blockchain is typically managed by a peer-to-peer network collectively adhering to a protocol for inter-node communication and validating new blocks. Once recorded, the data in any given block cannot be altered retroactively without alteration of all subsequent blocks, which requires consensus of the network majority. Although blockchain records are not unalterable, blockchains may be considered secure by design and exemplify a distributed computing system with high Byzantine fault tolerance. Decentralized consensus has therefore been claimed with a blockchain.[8]





31


32

# A Brief History of Time – Blockchain/bitcoin begins

**2008**

**September 2008**

Financial crisis

**October 31, 2008**

Satoshi Nakamoto

Blockchain/Bitcoin whitepaper **CM01**



33





# A Brief History of Time – Blockchain 2009 and 2010

**January 2009**

Genesis block

Open source Bitcoin version 0.1

First bitcoin transaction

**October 2009**

Bitcoin exchange rate is established

**February 2010**

Bitcoin market is established (Bitcoin as currency exchange)

**May 2010**

First real-world bitcoin transaction (Pizza)



34

## Satoshi Nakamoto

- Shinichi Mochizi of Kyoto Univeristy
- Dorian Satoshi Nakamoto
- Hal Finney
- Craig Wright, currently being sued by the estate of
- Dave Kleiman



35



https://bitcoin.org/bitcoin.pdf

**Bitcoin: A Peer-to-Peer Electronic Cash System**

Satoshi Nakamoto
satoshin@gmx.com
www.bitcoin.org

**Abstract.** A purely peer-to-peer version of electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone.

### 1. Introduction

Commerce on the Internet has come to rely almost exclusively on financial institutions serving as trusted third parties to process electronic payments. While the system works well enough for most transactions, it still suffers from the inherent weaknesses of the trust based model. Completely non-reversible transactions are not really possible, since financial institutions cannot avoid mediating disputes. The cost of mediation increases transaction costs, limiting the minimum practical transaction size and cutting off the possibility for small casual transactions, and there is a broader cost in the loss of ability to make non-reversible payments for non-reversible services. With the possibility of reversal, the need for trust spreads. Merchants must be wary of their customers, hassling them for more information than they would otherwise need. A certain percentage of fraud is accepted as unavoidable. These costs and payment uncertainties can be avoided in person by using physical currency, but no mechanism exists to make payments over a communications channel without a trusted party.



36

Block

Decentralized

Digital signature

Hash

Mining

SHA 256

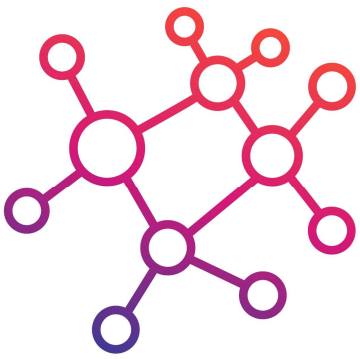
Open distributed ledger

Immutable



37





DECENTRALIZATION



38


39

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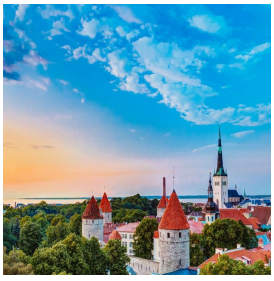




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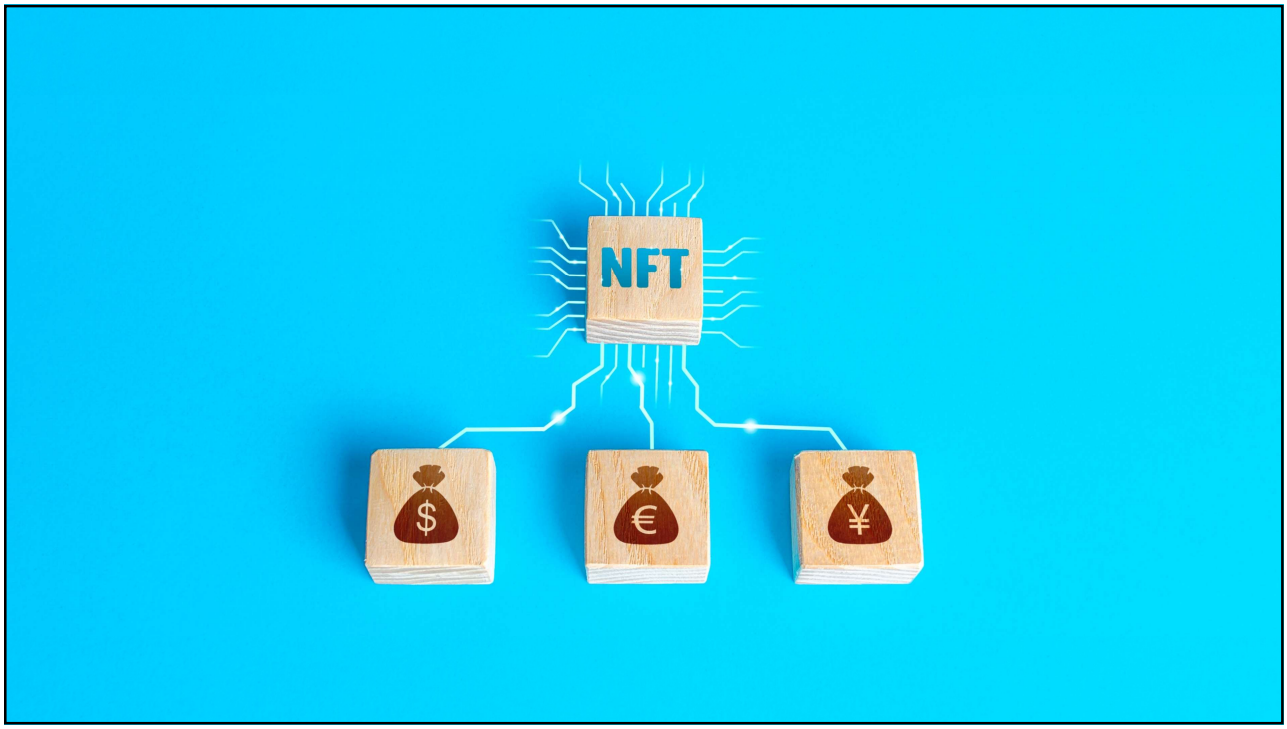


41



# PRIVACY




42

## PROFESSIONAL ETHICS AND TRANSFORMATIONAL TECHNOLOGY

| | PRIVACY | ESG | PROFESSIONAL JUDGEMENT |
|---|---|---|---|
| BIG DATA | ✖ | | |
| ARTIFICIAL INTELLIGENCE | | ✖ | ✖ |
| BLOCKCHAIN | | ✖ | ✖ |



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Data privacy means empowering your users to make their own decisions about who can process their data and for what purpose.



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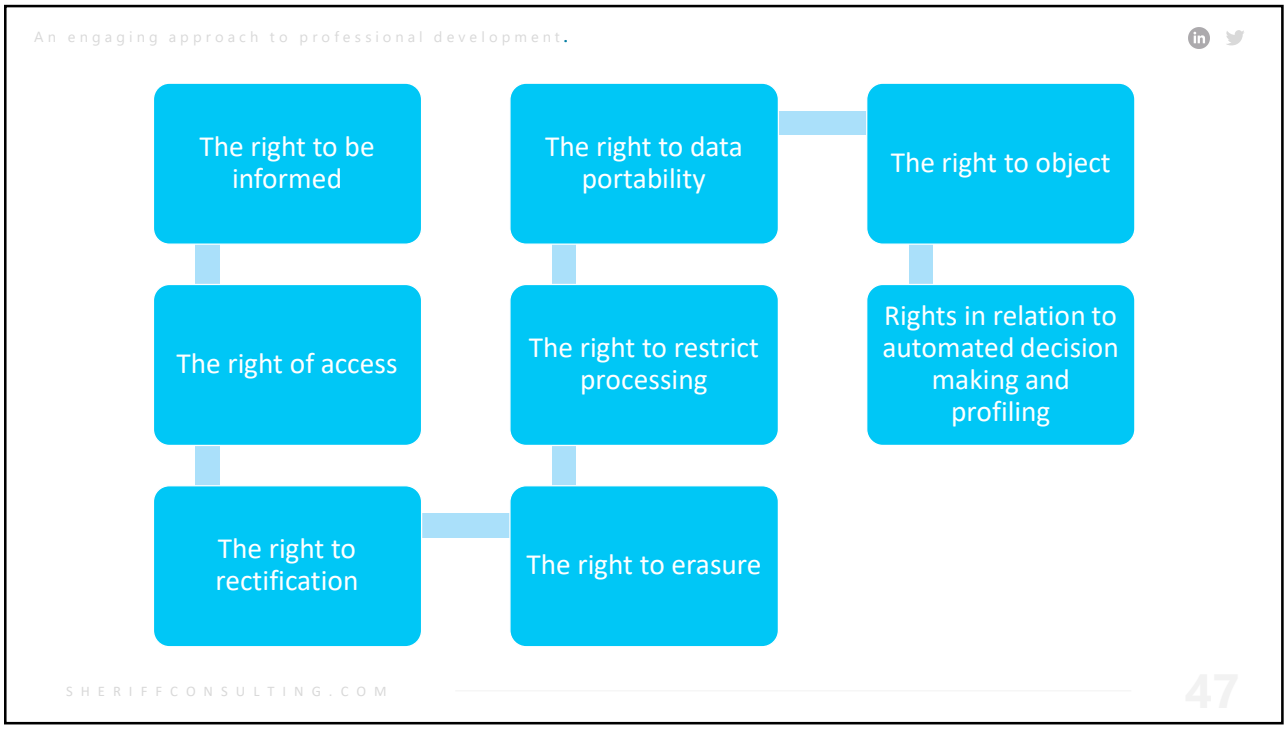
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The right to be informed
The right of access
The right to rectification
The right to erasure
The right to restrict processing
The right to data portability
The right to object
Rights in relation to automated decision making and profiling
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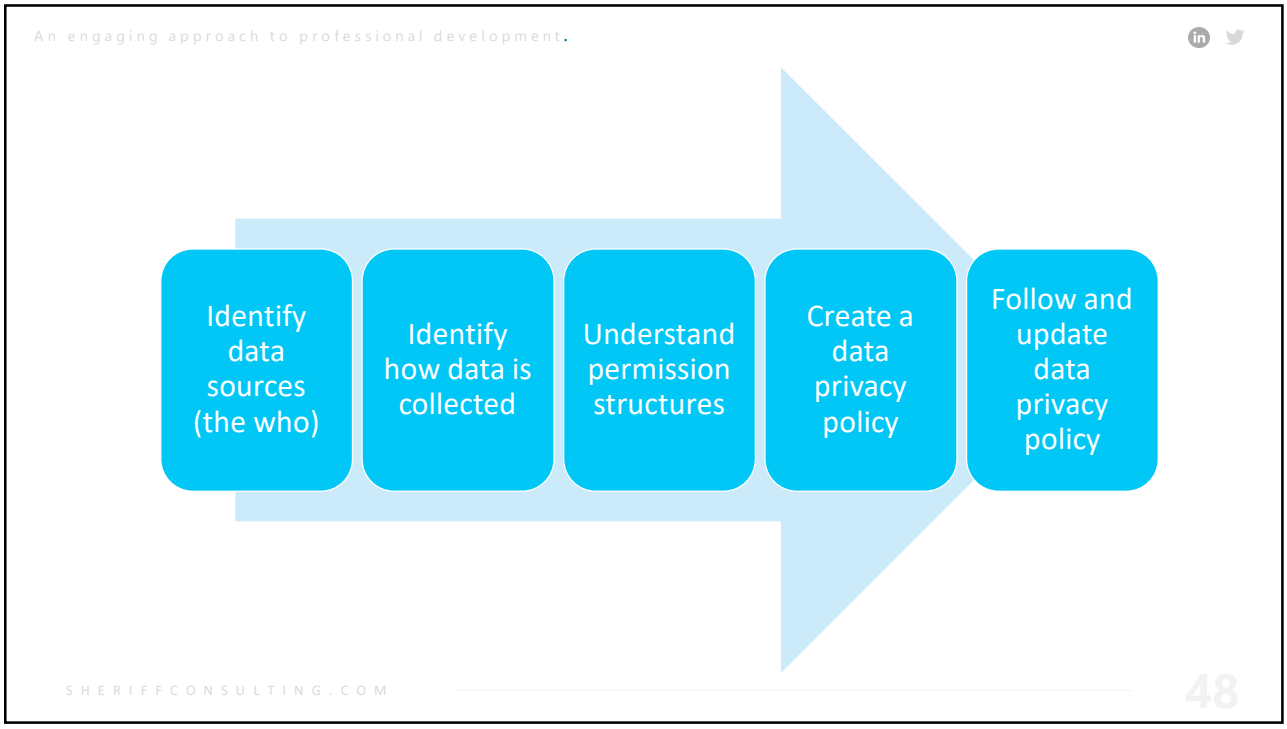
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Identify data sources (the who)
Identify how data is collected
Understand permission structures
Create a data privacy policy
Follow and update data privacy policy
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48

WHO ARE YOUR DATA SOURCES?

EMPLOYEES

CLIENTS/CUSTOMERS

SUPPLIERS

OTHERS



49



WHO ARE YOUR METHODS OF DATA COLLECTION?

| | |
|---|---|
| INDIRECT | Website (google analytics) |
| | Google Ads |
| | Constant contact/survey monkey |
| DIRECT | Accounting information |
| | Employee personal information |
| | Corporate tax (CRA) |



50

# Environment, social and governance (ESG)




51



ESG stands for Environmental, Social and Governance

A term used in capital markets and used by investors to evaluate corporate behaviour and to determine the future financial performance of companies.

It is used by investors to evaluate corporations and determine the future financial performance of companies.

ESG are a subset of non-financial performance indicators which include **sustainable**, **ethical** and **corporate governance** issues such as managing a company's carbon footprint and ensuring there are systems in place to ensure accountability.



52





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56


57



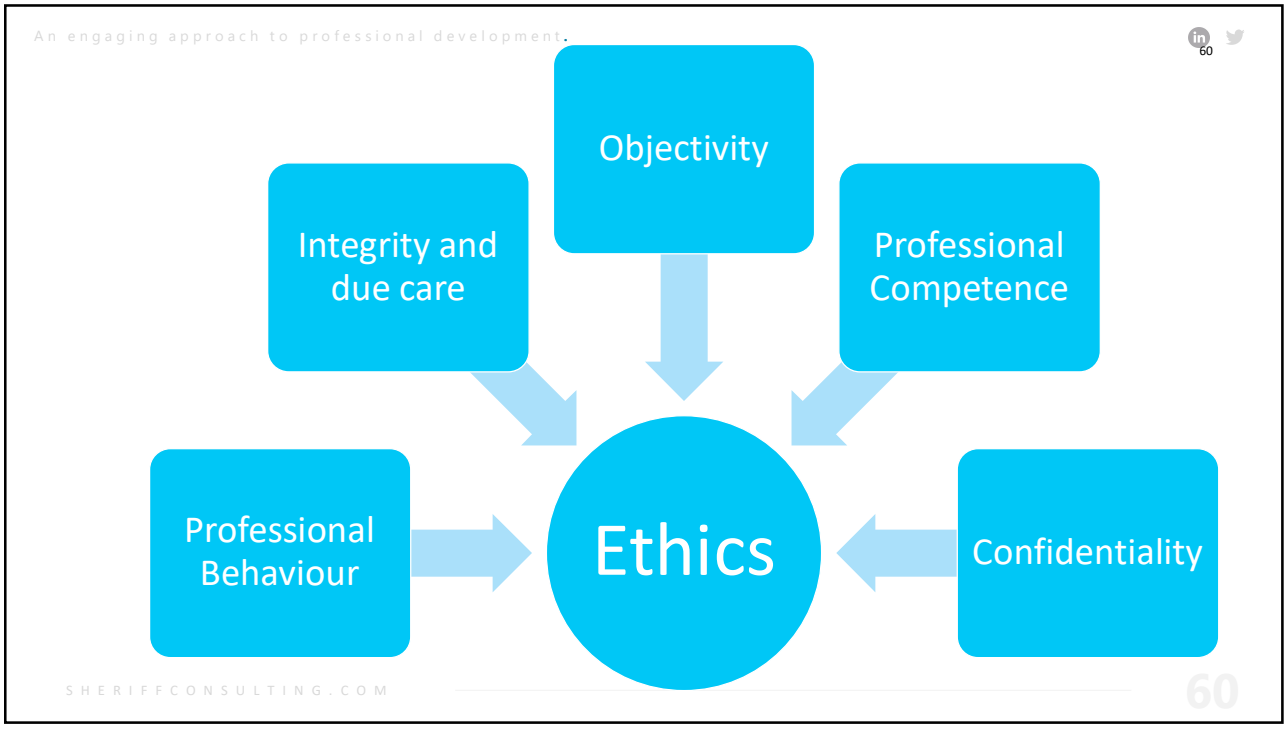
## Professional judgement




58


ETHICS

59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Professional Competence
Professional Behaviour
Ethics
Confidentiality
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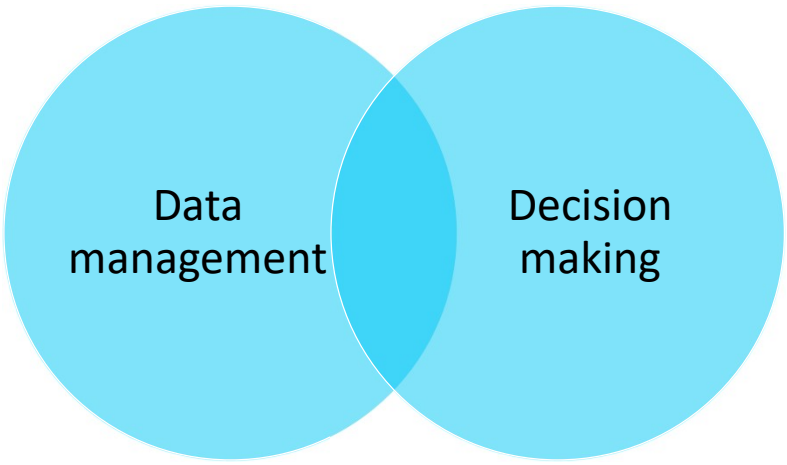
# THE ALIGNMENT PROBLEM



61





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# Safeguards and conclusion




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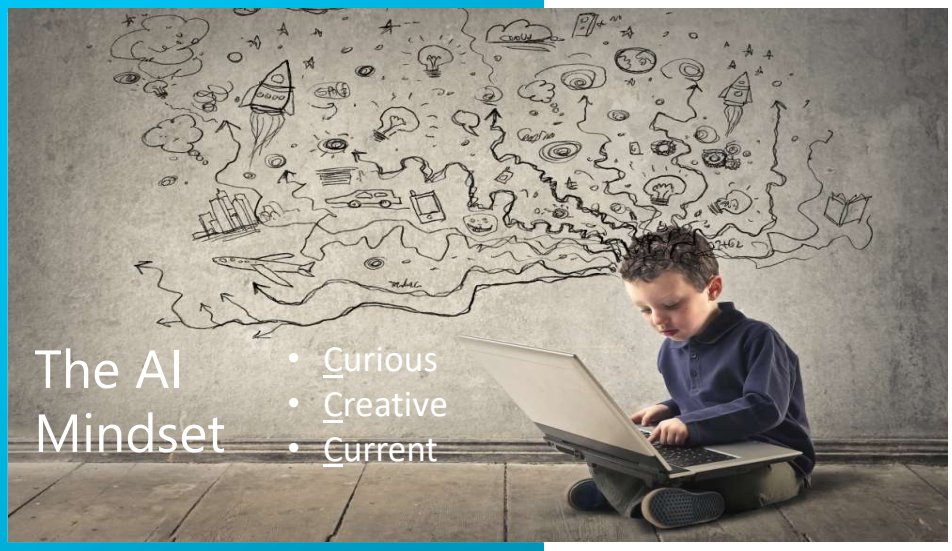


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1. Question whether you have the right data
2. Demonstrate curiosity about the underlying source
3. Use your professional judgement

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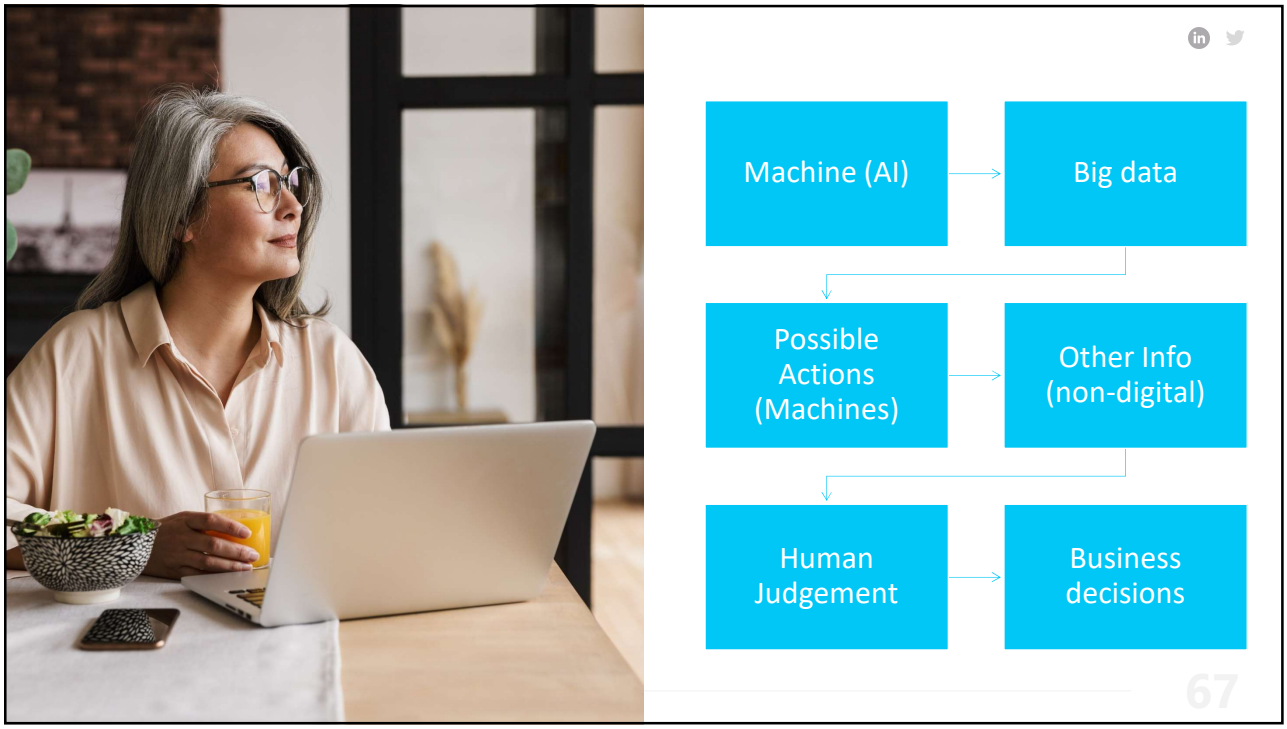
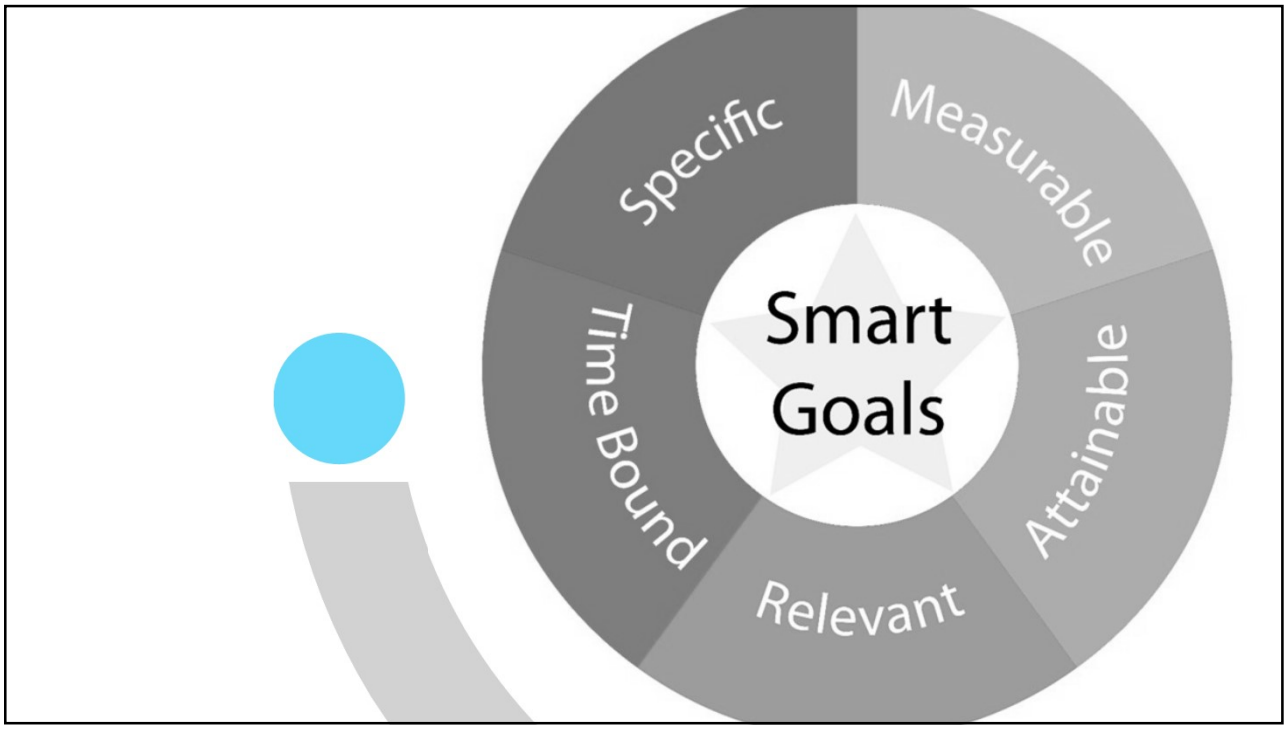

Machine (AI)
Big data
Possible Actions (Machines)
Other Info (non-digital)
Human Judgement
Business decisions
67

67


ETHICS

68

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CM02

# Action Steps