



# ARTIFICIAL INTELLIGENCE and the future of internal audit

CPA Abdhallah Mambo Dallu, Internal Auditor – Umma University

## Introduction

Artificial intelligence (AI) is a broad term that refers to technology that makes machines to be “smart.” Organisations are investing in AI research and applications to **automate, augment** or **replicate** human intelligence, human analytics and/or decision making. The internal audit profession must be prepared to fully participate in organisational AI initiatives.

## Putting AI into context

AI can be viewed as the latest significant advancement on a continuum of advancements that have occurred due to technology improvements. What is new is the advancement and scalability of technologies that have unleashed the practical application of AI.

There is already widespread application of AI across diverse sectors (publicly held, privately held, government and nonprofit) and industries. Consider, for example, that

AI enables a number of new and novel capabilities that were impossible just a few years ago. But it is not only new and novel activities affected by AI. More mundane tasks that have been occurring for decades are being improved by AI such as loss modelling, credit analysis, valuations, transaction processing and a host of others.

The accountant used to gather data himself. It would have taken weeks, even months, to do the work AI now does. The accountant now has time to be creative, think about solutions and his job is more exciting. He is viewed as a strategic partner in the firm.

**Auditor then:**  
Mundane, mind-numbing tasks; number crunching.

**Auditor now:**  
AI frees up 40 to 50 % of auditor’s time by analysing data. Auditor can now:

- use his expert decision-making abilities
- Use logic or reason to answer questions
- Become a strategic advisor.

### HOW AI IS AUGMENTING



An AI gathers volumes of data for an organisation, from within and without. It can analyse thousands of items in a data set and compare it to thousands of other items in a second data set - which in the past could not talk to each other. AI then puts the results of the comparison in an email and sends it to the accountant.

**Typical tasks**  
Compare items  
Detect patterns  
Uncover anomalies  
Develop predictive models to project revenue

**AI advantages**  
Accuracy  
Improve fraud detection

It is critical that internal auditors pay attention to the practical application of AI in business and develop competencies that will enable the profession to provide AI-related advisory and assurance services to organisations in all sectors and across all industries.

AI is dependent on big data and algorithms and it can be intimidating, especially for internal audit activities and organisations that have yet to master big data. But internal auditors do not have to be data scientists or quantitative analysts to understand what AI can do for organisations, governments and societies at large.

## AI – The basics

### Big Data and Algorithms

AI is powered by algorithms and algorithms are fueled by big data, so before an organisation embarks on AI, it should have a strong foundation in big data. And before internal audit can think about addressing AI, it should already have a strong foundation in big data.

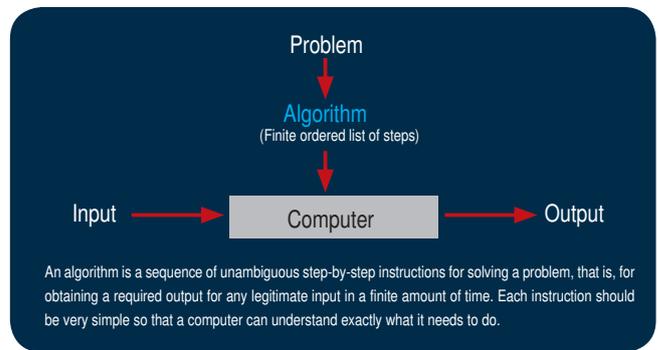
Big data means more than just large amounts of data, that is, data (information) that reaches such high volume, variety, velocity and variability that organisations invest in system architectures, tools and practices specifically designed to handle the data. Much of this data may be generated by the organisation itself while other data may be publicly available or purchased from external sources.

To put big data to good use, organisations develop algorithms. An algorithm is a set of rules for the machine



A strong data foundation is a prerequisite for success in AI

to follow. An algorithm is what enables a machine to quickly process vast amounts of data that a human cannot reasonably process, or even comprehend. The performance and accuracy of algorithms is very important. Algorithms are initially developed by humans, so human error and biases (both intentional and unintentional) will impact the performance of the algorithm. Faulty algorithms can produce minor undesirable glitches in an organisation’s operations or major catastrophic outcomes. It is generally recognised



## Importance of BIG DATA analytics

|  | Type of analytics            | Explanation   | Examples   |
|--|------------------------------|---|--|
| Algorithms help analyse the big data in 4 major ways | <b>Descriptive analytics</b> | Provides insight based on past information.<br><i>What is happening?</i>  | Used in standard report generation and in basic spreadsheet functions such as counts, sums, averages and percentage changes and in vertical and horizontal analyses of financial statements. |
|  | <b>Diagnostic analytics</b>  | Examines the cause of past results.<br><i>Why did it happen?</i>  | Used in variance analyses and interactive dashboards to examine the causes of past outcomes.   |
|  | <b>Predictive analytics</b>  | Assist in understanding the future and provides foresight by identifying patterns in historical data. What will happen?<br><i>When and why?</i>                   | Can be used to predict an accounts receivable balance and collection period for each customer and to develop models with indicators that prevent control failures.                           |
|  | <b>Prescriptive analysis</b> | Assist in identifying the best option to choose to achieve the desired outcome through optimisation techniques and machine learning.<br><i>What should we do?</i> | Used in identifying actions to reduce the collection period of accounts receivable and to optimise the use of payables discounts.  |



Algorithms help sort and manipulate the data

that flawed algorithms, at least in part, fuelled the 2008 global financial crisis.

## Types of AI

With advances in computing power - including machine learning, neural networks, natural language processing, genetic algorithms and computational creativity, to name just a few - it increasingly seems likely that artificial intelligence is evolving from simple to self-aware machines. There are four types of AI - from reactive to self-aware as illustrated below.

### Type I - Reactive machines

This is AI at its simplest. Reactive machines respond to the same situation in exactly the same way, every time. The machine perceives its environment/situation directly and acts on what it sees. It doesn't have a concept of the wider world. It can't form memories or draw on past experiences to affect current decisions. It specialises only in one area. An example of this is a machine that can beat world-class chess players because it has been programmed to recognise the chess pieces, know how each moves, and can predict the next move of both players. This type is good for repetitive jobs, for example, car parking payment systems, ATMs, milk dispensers and so on.



### Type II - Limited memory

Limited memory AI machines can look to the past, but the memories are not saved. Limited memory machines cannot build memories or "learn" from past experiences. An example is a self-driving vehicle that can decide to change lanes because a moment ago it noted an obstacle in its path.

### Type III - Theory of mind

Theory of mind refers to the idea that a machine could recognise that others it interacts with have thoughts, feelings and expectations. A machine embedded with Type III AI would be able to understand others' thoughts, feelings and expectations and be able to adjust its own behaviour accordingly.



### Type IV - Self-awareness

A machine embedded with Type IV AI would be self-aware. An extension of "theory of mind," a conscious or self-aware machine would be aware of itself, know about its internal states and be able to predict the feelings of others.

## AI opportunities and risks

The first step towards understanding the organisation's AI opportunities and risks is to thoroughly understand the organisation's big data opportunities and risks. Below are examples of AI opportunities and risks.

### (a) Opportunities in AI

- The ability to compress the data processing cycle.
- The ability to reduce errors by replacing human actions with perfectly repeatable machine actions.
- The ability to replace time-intensive activities with time-efficient activities (process automation), reducing labour time and costs.

- The ability to have robots or drones replace humans in potentially dangerous situations.
- The ability to make better predictions, for everything from predicting sales of certain goods in particular markets to predicting epidemics and natural catastrophes.
- The ability to drive revenue and grow market share through AI initiatives.

### (b) Risks of AI

- Unidentified human biases might be imbedded in the AI technology.
- Human logic errors might be imbedded in the AI technology.
- Inadequate testing and oversight of AI might result in ethically questionable results.
- AI products and services might cause harm, resulting in financial and/or reputational damage.
- Customers or other stakeholders might not accept or adopt the organisation's AI initiatives.
- The organisation might be left behind by competitors if it does not invest in the right AI systems.
- Investment in AI (infrastructure, research and development and talent acquisition) might not yield an acceptable ROI.

## Internal audit's role

Internal audit is adept at evaluating and understanding the risks and opportunities related to the ability of an organisation to meet its objectives. Leveraging this experience, internal audit can help an organisation evaluate, understand and communicate the degree to which artificial intelligence will have an effect (negative or positive) on the organisation's ability to create value in the short, medium or long term. Internal audit can engage through at least five critical and distinct activities related to artificial intelligence:

### AI and the office of finance

- The office of finance is part of business decisions.
- Many business processes could be automated (Big data, analysis, management reports).
- Accounting systems have over time reduced the need for manual input (automation of processes).
- Storing the rules (accounts, tax, pricing and so on) and then crunching the big data as part of analysing the business.
- Cost controls (internal audit, cybersecurity, approval processes).

- (a) For all organisations, internal audit should include AI in its risk assessment and consider whether to include AI in its risk-based audit plan.
- (b) For organisations exploring AI, internal audit should be actively involved in AI projects from their beginnings, providing advice and insight contributing to successful implementation. However, to avoid the perception of or actual impairments to both independence and objectivity, internal audit should not own, nor be responsible for the implementation of AI processes, policies or procedures.
- (c) For organisations that have implemented some aspect of AI, either within its operations (such as a manufacturer using robotics on a production line) or incorporated into a product or service (such as a retailer customising product offerings based on purchase history), internal audit should provide assurance over the management of risks related to the reliability of underlying algorithms and data on which the algorithms are based.
- (d) Internal audit should ensure the moral and ethical issues that may surround the organisation's use of AI are being addressed.
- (e) Like the use of any other major system, proper governance structures need to be established and internal audit can provide assurance in this space.

Regardless of the specific activities performed, internal audit is well-suited to be a key contributor to an organisation's AI-related activities. Internal audit:

- (i) Understands the strategic objectives of the organisation and the processes implemented to achieve those objectives.
- (ii) Is able to evaluate whether AI activities are accomplishing their objectives.
- (iii) Can provide internal assurance over management's risk management activities relevant to AI risks.
- (iv) Is perceived as a trusted advisor that can positively support the adoption of AI to improve business processes or enhance product and service offerings.





## PROMISE OF AI FOR INTERNAL AUDIT INTERNAL AUDIT

- Improving quality of audit
  - Frequency of audit
  - Entire population of data instead of a random sample
  - Avoiding misstatement
- Faster audit
- Ability for real-time fraud monitoring and detection
  - Deep learning focused on finding anomalies

## AI auditing framework

The Framework comprises three components; AI strategy, governance and the human factor.

### AI Strategy

Each organisation's AI strategy will be unique based on its approach to capitalising on the opportunities AI provides. An organisation's AI strategy might be an obvious extension of its overall digital or big data strategy. Internal audit must consider an organisation's AI strategy first by answering the following three questions.

- 1) Does the organisation have a defined strategy toward AI?
- 2) Is it investing in AI research and development?
- 3) Does it have plans in place to identify and address AI threats and opportunities?

AI can become a competitive advantage for organisations and internal audit should help management and the board realise the importance of formulating a deliberate AI strategy consistent with the organisation's objectives.

### Governance

AI governance refers to the structures, processes and procedures implemented to direct, manage and monitor the AI activities of the organisation in pursuit of achieving the organisation's objectives. The level of formality and structure for an organisation's AI governance will vary based on the specific characteristics of that organisation.

Regardless of the specific approach, however, AI governance establishes accountability and oversight, helps to ensure that those responsible have the necessary skills and expertise to effectively monitor AI

and further helps to ensure the organisation's values are reflected in its AI activities. AI activities must result in decisions and actions that are in line with the ethical, social and legal responsibilities of the organisation.

### The human factor

Algorithms are developed by humans. Human error and biases (both intentional and unintentional) will impact the performance of the algorithm. The human factor component considers whether:

- The risk of unintended human biases factored into AI design is identified and managed.
- AI has been effectively tested to ensure that results reflect the original objective.
- AI technologies can be transparent given the complexity involved.
- AI output is being used legally, ethically and responsibly.

It is widely recognised that human error is the most common cause of information privacy and security breaches. Similarly, the human factor component addresses the risk of human error compromising the ability of AI to deliver the expected results.

## Conclusion

The internal audit profession cannot be left behind in what may be the next digital frontier — artificial intelligence. To prepare, internal auditors must understand AI basics, the roles that internal audit can and should play and AI risks and opportunities. To meet these challenges, internal auditors should leverage the framework to deliver systematic, disciplined methods to evaluate and improve the effectiveness of risk management, control and governance processes related to AI.