IFC Satellite Seminar on "Granular data: new horizons and challenges for central banks"

Data and analytics risk management framework for central banking[1]

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[1] This contribution was prepared for the IFC Satellite Seminar held at the ISI 64th World Statistics Congress, co-organised with the Bank of Canada in Ottawa, Canada, on 15 July 2023. The views expressed are those of the authors and do not necessarily reflect the views of the Bank of Canada, the BIS, the IFC or the other central banks and institutions represented at the event.

Data and analytics risk management framework for central banking

By:
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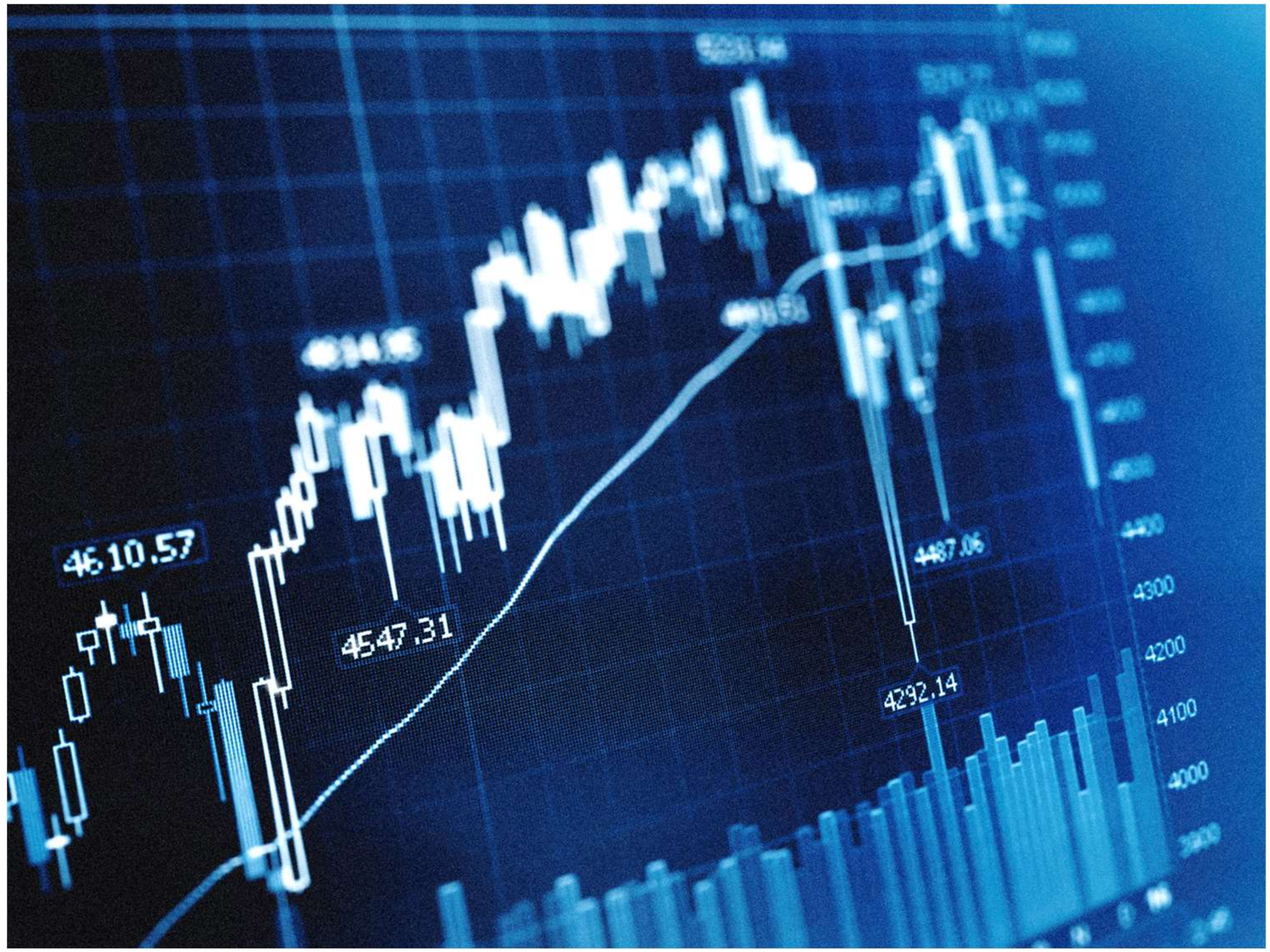
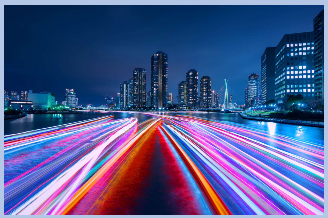


Outline

- Introduction
- Data & Analytics
  - Definitions
  - Changing Landscape
- Context
  - Benefits and Risks
  - Legislation, regulations and other initiatives
  - Research & News
- Data and Analytics Risk Management
  - Pillars
  - Responsible AI
- Next Steps
- Conclusion

Introduction

Data and analytics have changed drastically in the past years



What's new?

Data

- More velocity, granularity, and volume
- Comes from various sources

Analytics

- Increased use of AI
- Ethics of advanced analytics
- Disruptive nature of generative AI

Indeed, it seems like we have entered a new era…

INNOVATIONS

ChatGPT took their jobs. Now they walk dogs and fix air conditioners.

Technology used to automate dirty and repetitive jobs. Now, artificial intelligence chatbots are coming after high-paid ones.

By Pranshu Verma and Gerrit De Vynck
June 2, 2023 at 6:00 a.m. EDT

Lawyer apologizes for fake court citations from ChatGPT

By Ramishah Maruf, CNN
Updated 3:28 PM EDT, Sun May 28, 2023

Disinformation Researchers Raise Alarms About A.I. Chatbots

Researchers used ChatGPT to produce clean, convincing text that repeated conspiracy theories and misleading narratives.

Science News *from research organizations*

Study finds ChatGTP outperforms physicians in providing high-quality, empathetic advice to patient questions

Date: April 28, 2023
Source: University of California - San Diego

MOTHERBOARD
TECH BY VICE

A Judge Just Used ChatGPT to Make a Court Decision

The case is the first time a court has admitted to using the AI text generator's answers in a legal ruling.

By Janus Rose
NEW YORK, US

February 3, 2023, 12:28pm Share Tweet Snap

Which is reflected in research…

International Journal of Information Management
Volume 71, August 2023, 102642

Opinion Paper: “So what if ChatGPT wrote it?” Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy ☆

Yogesh K. Dwivedi [a b], Nir Kshetri [c], Laurie Hughes [a], Emma Louise Slade [d], Anand Jeyaraj [e], Arpan Kumar Kar [f g], Abdullah M. Baabdullah [h], Alex Koohang [i], Vishnupriya Raghavan [j], Manju Ahuja [k 1], Hanaa Albanna [l 1], Mousa Ahmad Albashrawi [m 1], Adil S. Al-Busaidi [n o 1], Janarthanan Balakrishnan [p 1], Yves Barlette [q 1], Sriparna Basu [r 1], Indranil Bose [s 1], Laurence Brooks [t 1], Dimitrios Buhalis [u 1], Lemuria Carter [v 1]…Ryan Wright [bq 1]

Computers in Human Behavior
Volume 138, January 2023, 107451

Full length article

Adapt and overcome: Perceptions of adaptive autonomous agents for human-AI teaming

Allyson I. Hauptman, Beau G. Schelble, Nathan J. McNeese, Kapil Chalil Madathil

EDITOR'S CHOICE

Diagnosing Physician Error: A Machine Learning Approach to Low-Value Health Care

Sendhil Mullainathan and Ziad Obermeyer

The Quarterly Journal of Economics, Volume 137, Issue 2, May 2022, Pages 679–727, https://doi.org/10.1093/qje/qjab046

Published: 03 December 2021

Review Paper | Published: 09 February 2023

Can artificial intelligence’s limitations drive innovative work behaviour?

Araz Zirar

Review of Managerial Science (2023) | Cite this article

Published: 09 February 2023

Predicting the contribution of artificial intelligence to unemployment rates: an artificial neural network approach

Mihai Mutascu & Scott W. Hegerty

Journal of Economics and Finance **47**, 400–416 (2023) | Cite this article

Change brings…

OPPORTUNITIES

and

RISKS

Reduction of menial tasks

Data Exploration

Responsiveness

Innovation

Productivity

Oversight

Quality

Ethics

Efficiency

Clarity

Rights

Responsibility

Agility

Research

Scalable

Law

Decrease in repetitive tasks

Safer workplace

Risks

Opportunity Risk
Psychological Health
Unskilled Workforce
Privacy
Productivity
Accuracy
Quality
Security
Explainability
Marginal Groups
Bias
Ethics
Cyber Threats
Rights
Safety
Deception
Copyright
Law
Less entry level jobs
Data Accessibility

In summary…

Data and analytics risks as we know them today are only the tip of the iceberg.

In the coming years, our exposure to an increasing number of unknown risks related to various data types and artificial intelligence are to grow significantly.

Leveraging Modern Data and Analytics in a central bank context

Public Landscape

Increasingly, institutions are elaborating initiatives for AI systems and non-traditional/alternative data usage.

Government of Canada

- Artificial Intelligence and Data Act (AIDA)
- TBS Automated Decision-Making Directive

GOV.UK

- A Pro-Innovation Approach to Regulating AI

- **Artificial Intelligence Act (AIA)**

OSFI BSIF

- [FIFAI (Forum) on Canadian Perspective on Responsible AI]
- **<u>Revisions to E-23 on Model Risk Management</u>**

THE WHITE HOUSE

- Blueprint for an AI Bill of Rights

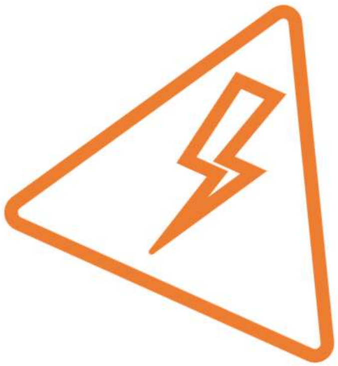
EUROPEAN CENTRAL BANK
EUROSYSTEM

- Provided advice on the AIA

Data and Analytics Risk Management

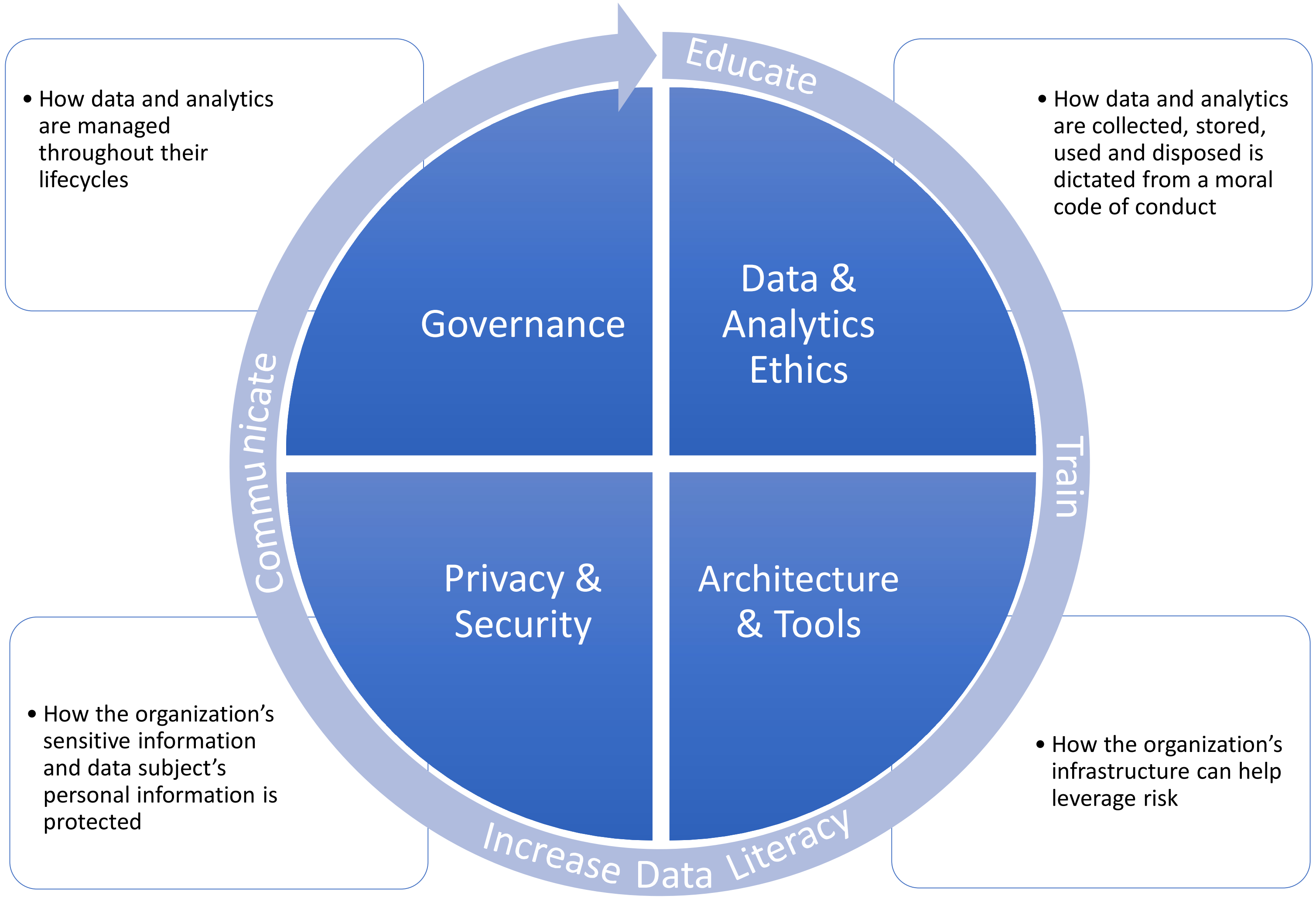
Data and Analytics Risk Management leverages the traditional risk management framework:

- Risk Identification
- Risk Assessment
- Risk Mitigation
- Risk Monitoring
- Risk Reporting



Pillars

Managing those risks entails reviewing current processes and capabilities alongst these four pillars while enabling employees to remain up-to-date in their data and analytics knowledge.



Governance

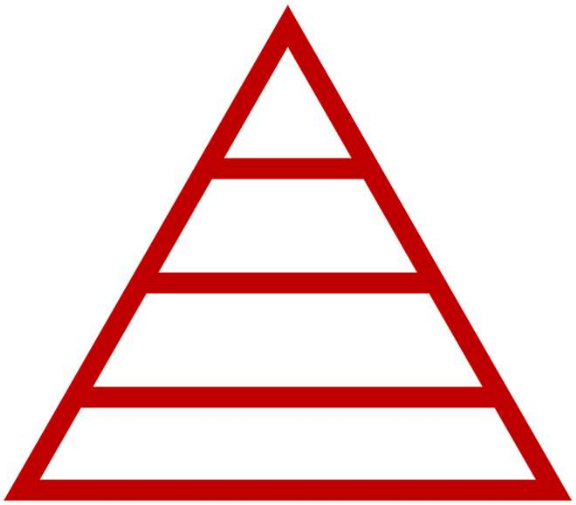
- Review different initiatives including Data Governance and Model Risk

- Create tools for data and models onboarding, management and use (For example, see the Algorithmic Impact Assessment tool)

Privacy and Security

- Assess data classification processes
- Research and use advanced techniques for privacy enhancement
- Build an awareness and educational program around AI systems and tools

Architecture and Tools



- Embed risk management checkpoint within the infrastructure (e.g. privacy by design)
- Enable data users to become self-sufficient with low-code tools
- Establish a dataset certification process

DATA AND ANALYTICS ETHICS

- Review risk management processes
- Establish Responsible AI principles and form an Advisory committee on Responsible AI
- Create educational tools for using AI