

# AI and Machine Learning for Complex Business Decision Making



## PART 2 – TECHNOLOGY FOR PROBLEM SOLVING

In **Part 2** of this six-part series of 10-minute reads, we present highlights of the [2020 MMPA Conference](#),<sup>1</sup> **AI and Machine Learning for Complex Business Decision Making**, to illustrate the versatility and ubiquity of new digital technologies and to spotlight CPAs' changing competencies and emerging opportunities.

[Part 1 - From Excel to AI: The Analytics Evolution](#) looks at the **analytics evolution** and the way CPAs in finance and audit need to adapt their analytics skillset to keep up with this rapidly changing field.

Here, [Part 2 - Technology for Problem Solving](#) warns against the **digital transformation trap**: losing sight of problem solving and, instead, following the lure of technology. How should CPAs assess AI technology and **value creation**?

[Part 3 - Systems Thinking and a Framework for Applying AI](#) looks at **systems thinking** – a critical-thinking competency for CPAs – and a **framework** for applying AI and machine learning to complex business decision making.

1 The 2020 MMPA Conference was hosted by the Master of Management & Professional Accounting (MMPA) Program and BIGDataAIHUB at the Institute for Management & Innovation (IMI), University of Toronto at Mississauga (UTM). The MMPA Program combines an MBA curriculum with the development of technical and leadership skills vital for the accounting profession.

[Part 4 - Data and Trust](#) examines **data management value chains**, new roles for CPAs and initiatives to ensure that data and AI systems are used fairly, accountably and transparently.

[Part 5 - Humans, Machines and Humachines](#) focuses on **human skills**. It introduces AI-augmented intelligence in emerging organizations called **humachines** and the way CPAs' human and technical skills can play a role in commercializing Canada's AI start-ups.

[Part 6 - Moving to an AI Advantage](#) looks at the way companies move to an **AI advantage** and steps CPAs can take to be future ready.

## PART 2 - Technology for Problem Solving

### The Digital Transformation Trap: A Solution Without a Problem

Many business leaders would be forgiven for thinking the new technology era is about implementing technology solutions and going through a **digital transformation** to become more efficient. They believe technology is yet another tool to acquire... and are closely watching what the competition is doing to keep up...

NADA SANDERS (SANDERS & WOOD, 2020, p. 192)

A 2018 McKinsey survey found that more than 80% of respondents had undertaken digital transformation, but few had reported success. Transformations of any type are hard - less than 30% are successful - but digital transformation is even harder. In the 2018 survey, only 16% of respondents said digital transformation improved performance with changes that could be sustained (McKinsey, 2018, p. 13).<sup>2</sup>

In other words, say speakers [Nada Sanders](#) and [Retsef Levi](#), what should guide an organization's effort is **not** the technology but the business metric or process or decision process that the organization wants to either enable or improve.

The technology solution should also be strategically aligned, [Michael Lionais](#) warns, or technology applications can fail. Suppose, for example, a company's competitive strategy for market leadership is "customer intimacy": understanding its customers well enough to offer personalized, highly customized products and services. If, instead, AI is developed for operational excellence, a strategy for high-volume, transaction-oriented, standardized production with little differentiation (MaRS, 2021), then the AI has completely failed to align with the company's *raison d'être*.

<sup>2</sup> The responses from McKinsey's January 2018 online survey Unlocking Success in Digital Transformations came from 1,793 participants representing a range of regions, industries, company sizes, functional specialties, and tenures. Of them, 1,521 participants had been part of at least one digital transformation in the past five years at either their current or previous organizations. To adjust for differences in response rates, the data were weighted by the contribution of each respondent's nation to global GDP.

## Start With a Problem, Not the Technology

**Retsef Levi** assesses the application of AI in three use cases. The first shows that new technologies should **not** be used when they are not understood. The next shows that when problems are understood, designing intelligent processes and systems doesn't necessarily require AI. The third shows that if AI is appropriate, a problem focus can lead to a focused solution.

To assess a company's application of technology – an AI process or system – Levi advises asking these questions:

- What is the business rationale?
- What are the AI elements? What functions are they supposed to enable?
- What data are needed? How will data be acquired?
- What is the interface with humans, particularly with **expert operators** (those with subject expertise)? In other words, how will humans interact with the AI tools?

Levi applies the questions to the applications of analytics, artificial intelligence and machine learning in three use cases.

### **Use case: Complex technology is not the solution when it is not understood.**

In 2020, after 114 years in business, the billion-dollar multinational Li & Fung, which provided supply chain management and broker services to U.S.- and EU-based apparel companies, was de-listed from the Hong Kong Stock Exchange and taken private after losing profitability and market share. The company's digital transformation didn't give it the needed competitive edge against Alibaba and Amazon. Why? See [Use Case: Li & Fung: A Digital Transformation](#).

Levi asks whether the [Li & Fung Digital Platform promotional video](#) of the digital transformation:

- explains what AI functions connect to business metrics or how they would improve their clients' experience (After decades of client service, was the Li & Fung software platform putting the onus on clients to source their own materials or manufacturers?)
- relies on use and sharing of data belonging to and in the possession of their clients or suppliers (Why would they share their data?)
- delegates human responsibility to a machine (Is an interface with humans clear? After decades of strong relationship building, did Li & Fung believe clients would be comfortable with such a change?)

## USE CASE: Li & Fung: A Digital Transformation

(Retsef Levi)

**The Company.** Founded in 1906 as a family company, Li & Fung privatized in the early 1970s to separate management from ownership and allow changes to the firm. The company provided supply chain management and broker services to U.S.- and EU-based apparel companies. It expanded to hold brands and stores. Its innovation was in **distributed manufacturing**: breaking apart product orders to find the best raw materials, supplies and manufacturers in Asia and China for each step in the manufacturing process to fill orders quickly. Known for their decades-long personal relationships with suppliers, they used the Internet to strengthen communications with customers to keep the business relevant in the digital age (Funding Universe, c. 2004).



**The problem.** Challenged by new players Alibaba and Amazon that cut out their intermediary role between suppliers and customers, in 2016, the company declared a “Digital Transformation.” Its goal was “...to create the supply chain of the future to help [their] customers navigate the digital economy and to improve the lives of one billion people in the supply chain (Li & Fung, [2018]).” Instead, digital transformation did not return the company to its former profitability. The company was de-listed and taken private in 2020 (Ng & You, 2020).

**Watch the Li & Fung [Digital Platform promotional video](#).**

Most importantly, did Li & Fung have a business rationale beyond digital transformation? How their digital transformation connected to business metrics is unclear, says Levi. The company seemed to look at technology first instead of a decision-making process to improve or a problem to solve.

### TAKE-HOME LESSONS

Digital transformation is not a business strategy. Thinking about digital transformation as a business strategy is one of the most immediate failure modes that companies can enter. Innovation or automation alone is not a concrete plan. It will cause individuals and organizations to struggle.

RETSEF LEVI

The Li & Fung example is not atypical, says Levi. The terms in their video, like those collected interactively from the conference audience ([Figure 2.1](#)), are commonly used by companies with only a vague sense of what digital transformation means. Even so, they can produce impressive promotional material about it, which, as in the Li & Fung example, does not contribute to value realization.

FIGURE 2.1: WHAT “DIGITAL TRANSFORMATION” MEANS TO CONFERENCE ATTENDEES



Source: Speaker Retsef Levi

### Use case: Complex technology is not the only solution

Adopting AI technology is expensive and time consuming, Levi warns. When the focus is solving a problem, more than one solution may achieve the same metrics possibly for less and much faster. See [Use Case: Cashier-less Convenience: Amazon Go Stores Versus French Retailer Monoprix](#) and compare their video stories.

#### USE CASE: Cashier-less Convenience: Amazon Go Stores Versus French Retailer Monoprix

(Retsef Levi)

**Amazon Go** stores, opened in 2016 after seven years and \$300 million in development, have no cashiers. Customers shop and leave the store. Costs are tallied in a virtual cart and charged to their Amazon account via smartphone. Amazon Go's "walkout technology" uses "...computer vision deep learning algorithms and sensor fusion [cameras, weights] much like...self-driving cars." [From the video.] The applied AI has the combined very difficult tasks of measuring the environment (weighing items, weight-sensing shelves, visual cues) and interpreting those signals (choosing items, putting them back).

- Training data for the AI algorithms took seven years to obtain and required mock-up stores.
- Human interactions are with workers and consumers in the stores. Humans are still needed to ensure reliability of the system.



By contrast, **Monoprix**, a French retailer, allows customers to fill a cart with groceries and leave those at the store. Store staff will do the checkout and deliver them an hour later. They answered clients' dislike of lineups with a low-tech, customer-service solution they call **human technology**.

Compare the stories: [Amazon Go video](#); [Monoprix video](#).

### TAKE-HOME LESSONS

Unless you are Amazon, do not fall in love with technology. Focus instead on improving process outcomes or performance and find the best way to accomplish that. AI may be useful, but don't forget about other ways to achieve the same metrics. Look how expensive data can be. Do you have the right data? Enough data to train AI? What will it cost to obtain them?

### RETSEF LEVI

What are the social costs of Amazon Go technology? Is the customer's cost of digital surveillance worth the benefit of no cashiers, no lineups? Critics say that Amazon Go stores will not transform traditional retail "...unless the benefits to retailer and customer decisively outweigh the cost of the technology" (Harrison, et al., 2018). For Amazon Go, value realization in a traditional sense (increased transactions and revenue) may be delayed and not be shared by all stakeholders;<sup>3</sup> for Monoprix, the payoff is immediate for a relatively small investment. For both companies, innovation and improvements to service delivery may be the value created for the short term. For deep-pocketed Amazon Go, AI experience may be the long-term value created.

### VALUE CREATION HAPPENS BEFORE ITS REALIZATION THROUGH TRANSACTIONS

**For CPAs**, "...reliance on transactional data as the principal object of measurement is arguably the greatest strength of traditional accounting (provides for reliability and objectivity), but simultaneously its greatest limitation."

"[E]xploring viable approaches for value creation measurement, and the related roles of CPAs, is a major focus of CPA Canada's [ongoing] *Value Creation Decisions and Measurement Project*."

CPA CANADA FORESIGHT, 2020, p. 11

<sup>3</sup> For more information on value creation and realization, see CPA Canada and Rob McLean, *Value Creation Decisions and Measurement Primer*.

### Use case: When complex technology is appropriate, focus on a tractable problem

When complex technology is appropriate, focusing on a tractable issue can result in a focused AI solution with measurable outcomes.

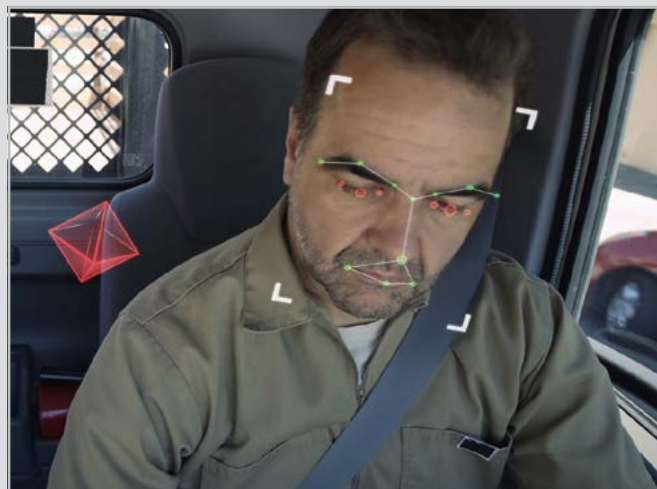
Nauto is a highly successful California-based start-up aimed at commercial fleets to reduce collisions. Unlike the Amazon Go example, the in-vehicle camera and image-processing algorithms have a very focused prediction task: Where is the driver's face? Where are the driver's eyes looking? See [Use Case: Nauto Driver Tracking](#).

#### USE CASE: Nauto Driver Tracking

(Retsef Levi)

**Nauto Driver Tracking.** Launched for commercial vehicle fleets, Nauto's alerts-and-control system can reduce accidents and liability costs. A very focused use of in-vehicle sensors, cameras and image processing algorithms leads to understanding which way the driver's face is turned and where the eyes are looking.

They enable intelligent processes not previously possible: detecting and warning of distracted driving in real time; uploading videos of high-risk events; recording of hard acceleration, braking or cornering events; and synthesizing "actionable insights and reporting" that driver supervisors use for driver coaching and improvement. Nauto says that its driver-behaviour alerts reduce the frequency, duration and distance of driver distractions (e.g., phoning, texting, eating, stereo use and drowsiness) in four out of five drivers (Nauto, 2021). Watch the [Nauto Tracking Drivers video](#).



Nauto's

- business rationale is to reduce accidents and liability costs
- training data are relatively easy to obtain (identifying where the driver looks)
- interface with humans is at the warning stage and between driver and supervisor

[Photo: Nauto Alerts & Control System: Face Focus (Source: Nauto. [AI-Powered Driver and Fleet Safety Platform](#) [Video].



### TAKE-HOME LESSONS

Nauto's focus on a tractable issue (distracted driving) results in a focused AI solution with measurable outcomes (reduced accidents and liability costs and improved driver behaviour) through actionable feedback to drivers and supervisors. The solution would not be possible before AI.

[Part 3](#), the next part in this six-part series, looks at **systems thinking** – a critical-thinking competency for CPAs – and a **framework** for applying AI and machine learning to complex business decision making.

## References, Part 2

- CPA Canada Foresight. (2020, February). [Value Creation Decisions and Measurement Primer \[PDF\]](#). CPA Canada.
- Funding Universe.com. [c. 2004]. [Li & Fung Limited History](#).
- Harrison, N., Faigen, G. & Brewer, D. (2018, February 8). [Why Amazon's Grocery Store May Not Be the Future of Retail](#). *Harvard Business Review* [Online].
- Li & Fung Ltd. [2018]. [Creating the Supply Chain of the Future: Annual Report 2017 \[PDF\]](#).
- MaRS. (2021). [Competitive strategies in operational excellence, customer intimacy and product leadership](#). MaRS Startup Toolkit [Website].
- McKinsey & Company. (2018, October 29). [Unlocking Success in Digital Transformations](#) [Survey].
- Nauto. (2021). [Reducing Distracted Driving with Nauto Driver Behavior Alerts](#) [Infographic].
- Ng, E. & You, E. (2020, May 27). [Li & Fung delists from Hong Kong's bourse after 28 years as supply chain manager is privatised while global trade roils](#). *South China Morning Post*.
- Sanders, N. & Wood, J. (2020). *The Humachine: Humankind, Machines, and the Future of Enterprise*. New York: Routledge (Taylor & Francis).

### CONTACTS

**Michael Wong**

Principal  
Research, Guidance and Support  
email: [michaelwong@cpacanada.ca](mailto:michaelwong@cpacanada.ca)

**Davinder Valeri**

Director  
Research, Guidance and Support  
email: [dvaleri@cpacanada.ca](mailto:dvaleri@cpacanada.ca)

Chartered Professional Accountants of Canada

### DISCLAIMER

This publication was prepared by the Chartered Professional Accountants of Canada (CPA Canada) as non-authoritative guidance.

CPA Canada and the authors do not accept any responsibility or liability that might occur directly or indirectly as a consequence of the use or application of or reliance on this material.

All rights reserved. This publication is protected by copyright. Written permission is required to reproduce, store in a retrieval system or transmit in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise).

For information regarding permission, please contact [permissions@cpacanada.ca](mailto:permissions@cpacanada.ca).  
Copyright © 2021 Chartered Professional Accountants of Canada