



CENTER FOR RETAILING

CFR EARLY INSIGHT #28

WHAT CAN RESEARCH TEACH US ABOUT AI IN RETAIL?

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Center for Retailing (CFR) at the Stockholm School of Economics has a mission to provide high-level academic education and to conduct world-class research on retailing in close collaboration with the Swedish retail industry. CFR Early Insight is a breakfast seminar series through which CFR faculty members share insights from ongoing research projects. The series provides a platform for employees at our partner companies to meet and discuss current challenges in retailing.

EKONOMI

SJ försvarar sin prismodell: "Vi tror på den"

(SJ in defence of their pricing model: "We believe in it")

PUBLICERAD 2022-11-09



What can research teach us about AI in retail?

beta



These papers suggest that AI can be used to improve the retail experience in various ways, such as by automating processes, personalizing the experience, and enhancing customer engagement. However, there are also some risks associated with using AI in retail, such as the potential for privacy breaches. [Heins 2022](#) found that there is an increase in AI literature within the field of retailing, but the field is fairly fragmented in scope and limited in methodologies. This suggests that there is more research that needs to be done in this area. Overall, these papers suggest that AI has the potential to improve the retail experience, but there are some risks that need to be considered. Further research is needed to explore the potential of AI in retail.

Add information about all papers

Abstract summary ✓

Intervention

Outcomes measured

Search for paper information

Paper title

Abstract summary



Artificial intelligence in retail: applications and value creation logics

👤 Lanlan Cao

2021 6 Citations

AI applications in retail create opportunities to improve data management, business processes, and value creation.



Artificial Intelligence in Retail: Benefits and Risks Associated With Mobile Shopping Applications

👤 Stanciu Victoria, S. Rindaşu

2021 1 Citations

Artificial intelligence is a fast-developing technology that can be exploited in mobile applications in an ethical manner, to protect users' privacy.



The social significance of AI in retail on customer experience and shopping practices

👤 Simon Moore, Sandy Bulmer, Jonathan Elms

📖 *Journal of Retailing and Consumer Services*

2022 2 Citations

AI digital humans afford novel social consequences and opportunities for in-store shopping experiences.



Artificial intelligence in retail – a systematic literature review

👤 Caroline Heins

📖 *foresight*

2022 Review 0 Citations

There is an increase in AI literature within the field of retailing.



How artificial intelligence will affect the future of retailing

👤 Abhijit Guha, Dhruv Grewal, Praveen K. Kopalle, Michael Haenlein, Matthew J. Schnei...

2021 21 Citations

The near-term impact of AI on retailing may not be as pronounced as the popular press might suggest.

“In the short run, AI will provide evolutionary benefits; in the long run, it is likely to be revolutionary”

(Davenport 2018, p. 7)

AGENDA

- AI in retailing research
- Common pitfalls
 - Data for AI in retail
 - Questions for AI retail
 - Applications for AI in retail
- Future research needs when it comes to AI in retail

POINT OF DEPARTURE

- Artificial intelligence (AI) is believed to have major impact on business in the coming years, especially so for retail (e.g., Cao 2021, Guha et al 2021)
- AI can be defined as the ability of a machine to perform functions we associate with human minds, such as perceiving, reasoning, learning, and problem solving.
- AI comprises several different methods (sometimes also referred to as technologies), such as Machine Learning, Deep Learning, Neural Networks, Robotics, Natural Language Processing, Machine Vision...
- In retailing, AI applications are likely to transform organizations on both the demand side (e.g., service operations) and supply side (e.g., supply chain and manufacturing)

Sources: Cao, L. (2021). Artificial intelligence in retail: applications and value creation logics. *International Journal of Retail & Distribution Management*, 49, 7, 958-976. DOI: [10.1108/IJRDM-09-2020-0350](https://doi.org/10.1108/IJRDM-09-2020-0350)

Guha, A., Grewal, D., Kopalle P. K., Haenlein, M., Schneider, M. J., Jung, H., Moustafa, R., Hegde, D. R. & Hawkins, G. (2021). How artificial intelligence will affect the future of retailing. *Journal of Retailing*, 97 (1), 28-41. DOI: [10.1016/j.jretai.2021.01.005](https://doi.org/10.1016/j.jretai.2021.01.005)

AI IN RETAIL RESEARCH

LITERATURE REVIEW: AI IN RETAIL

Natorina, Andersson, Rosengren, in progress

Funded by:

WASP—HS

- Until June 2022 (n = 91 articles)
- There is a growing literature on AI in retailing. Academic research on AI in retailing is primarily published in marketing journals, but we also find quite a few articles in general management and operations journals.
- Overall, research on AI in retail has focused primarily on demand side applications. The most common focus is on online customer assistance (mainly through chatbots). These studies focus/uses machine learning/deep learning, natural language processing, and robotics techniques.
- Comparing academic research with practitioner priorities it seems that academic research is overly focused on demand side applications such as service operations at the expense of supply side applications such as supply chain and manufacturing.

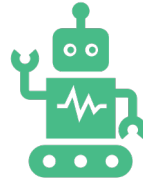
SOME INITIAL REFLECTIONS...

Natorina, Andersson, Rosengren, in progress



Using AI to answer Research Questions

(long established)



Testing effects of AI in retail,
typically focused on robots,
especially chatbots

(established)



Investigating
implementation and
implications of AI in practice

(under development)

COMMON PITFALLS

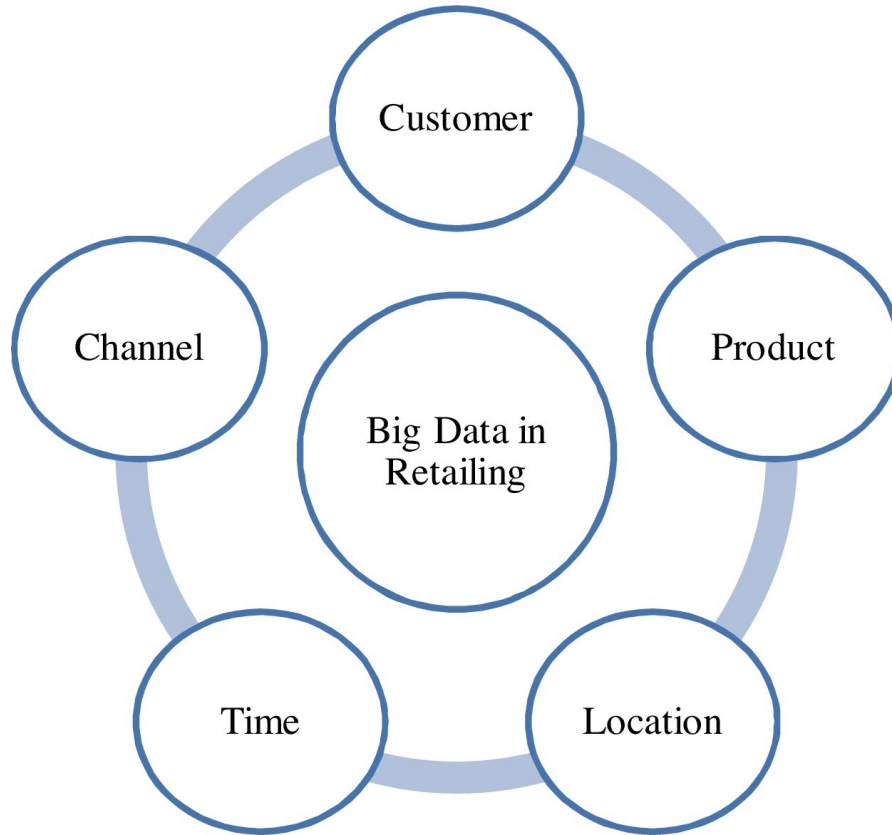
PITFALLS FOR BIG DATA AND AI IN RETAILING

Adapted from Dekimpe (2020)

- Not looking “beyond the hype”
- Over-confidence and over-reliance on analytics
- Putting customers' trust on the line
- Not every problem requires or benefits from AI
- Not investing enough in capabilities related to AI
 - (i) people,
 - (ii) systems,
 - (iii) processes, and
 - (iv) organization

DATA FOR AI IN RETAIL

DATA QUALITY



Errors and inconsistencies?

Old vs. new?

Lack of integration?

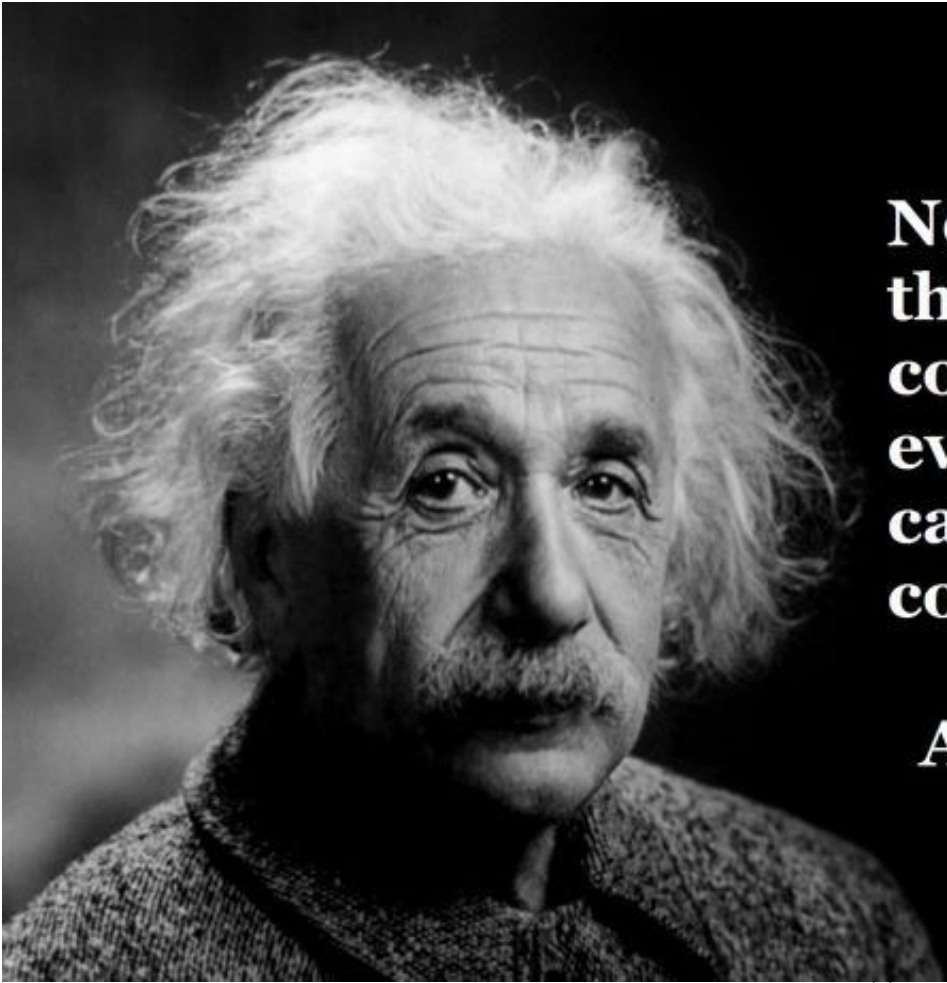
Endogeneity?

What is missing?

FROM DATA-DRIVEN DECISIONS TO DECISION-DRIVEN DATA ANALYTICS

Data-Driven Decision-Making	Decision-Driven Data Analytics
Anchor on data that is available.	Anchor on a decision to be made.
Find a purpose for data.	Find data for a purpose.
Start from what is known.	Start from what is unknown.
Empower data scientists.	Empower decision makers.

de Lange and Puntoni (2020)

A black and white portrait of Albert Einstein, showing his characteristic wild, white hair and mustache. He is looking slightly to the right of the camera with a thoughtful expression. The background is dark and out of focus.

**Not everything
that counts can be
counted, and not
everything that
can be counted
counts.**

Albert Einstein

QUESTIONS FOR AI RETAIL

ASCARZA'S THREE REASONS WHY AI INVESTMENTS FAIL

1. Failure to ask the right questions (“alignment”)
2. Failure to weigh the value of being right vs. the cost of being wrong (“asymmetry”)
3. Failure to leverage granular predictions (“aggregation”)

Underlying these issues are often failure in communications between data scientists and managers

[Ascarza, Ross and Hardie \(2021\)](#)

ASKING THE RIGHT QUESTION



- “How do we reduce churn?”



- “How can we best allocate our budget for retention promotions to reduce churn?”



- “Given a budget of \$x million, which customers should we target with a retention campaign?”

Ascarza, Ross and Hardie (2021)

SUGGESTED SOLUTIONS

1. Spend time understanding the problem that is to be solved.
 - Define it on the atomic level – what is the question to be answered and how will decisions be made?
2. Identify lost opportunities in current approaches.
 - Lost opportunities should be identified on the atomic level – they are lost in aggregates and averages.
3. Identify causes of waste and missed opportunities.

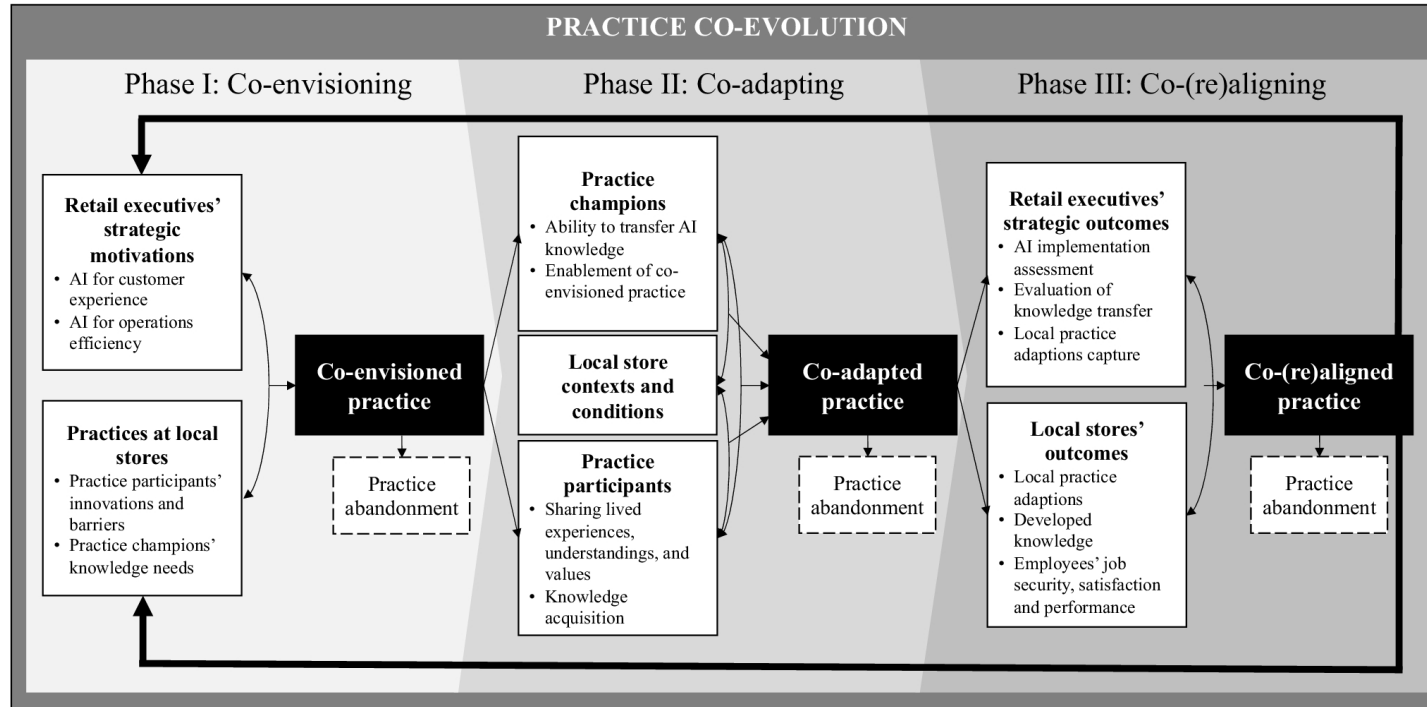
APPLICATIONS FOR AI IN RETAIL

DEMAND SIDE APPLICATIONS OF AI

- During adaption: AI is held to a higher standard and less trusted
 - Use for objective and cognitive (not subjective and emotional) tasks
 - Use for non-consequential (not consequential) tasks
- During usage: AI is evaluated based on how it performs
 - Use to explain functions “how” (not rationale “why”)
 - Use for standardized (not personalized tasks)
- Many risks related to privacy, bias and ethics
- Path forward: augmented rather than automated AI?

Davenport et al (2020)

SUPPLY SIDE APPLICATIONS OF AI

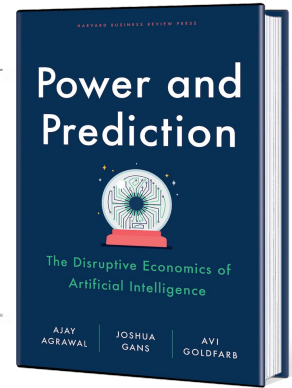


Note: Practice participants are those who perform a practice (e.g., store employees), whereas practice champions are those who intentionally disseminate a practice (e.g., senior executives, local retail managers, and trainers) (Dilling et al. 2013). Discursive channels are indicated by the double-headed arrows and observed causal paths are indicated by single-headed arrows.

Bonetti et al (2022)

FROM AUTOMATION AND PREDICTION TO TRANSFORMATION

-
- ● The introduction of AI into your company's decision-making doesn't affect just you. It also affects your partners in the value chain and the ecosystem you operate in.
-



[Agrawal et al \(2022\)](#)

CONCLUSIONS

- In the short run, AI will provide evolutionary benefits; in the long run, it is likely to be revolutionary. Currently supply-side applications of AI are likely to be most impactful in retail, but over time AI will likely transform business models, organizations and markets.
- Successful implementation of AI requires accurate data management processes, the ability to ask the right questions, as well as an understanding of how managerial decision making will change with the implementation of AI.
- Academic retail research has focused mostly on demand-side rather than supply chain applications and digital rather than physical implementation. Thus, there is still much to be learned about the impact of AI in retailing.

Brainstorm research questions

Input

What can research teach us about AI in retail?

Clear unstarred



- ☆ What are the most promising applications for retail AI?
- ☆ How have retail firms started to automate and what can this tell us about AI?* How are consumers reacting to AI in retail?
- ☆ What is the most effective research method for studying AI in retail?
- ☆ How much labor is being displaced in retail by automation, how quickly is this occurring, and where does it occur?
- ☆ Are there differences in retail experience between shoppers using human salespersons and cashiers, or between shoppers using machines and cashiers?
- ☆ How is AI integrated in the e-commerce value chain?
- ☆ What are the major points of AI adoption in consumer-facing retail?
- ☆ How much will consumers buy online in 2030?

FEBRUARY & MAY

Next CFR EARLY INSIGHT

Ideas, feedback, comments?
Please tell us by e-mailing karl.strelis@hhs.se

CENTER FOR RETAILING RESEARCH THEMES 2022-24

THE NEW RETAIL ECOSYSTEM

Retailing is undergoing rapid changes due to digitalization. These changes profoundly transform the industry as they enable new business models and new actors to become increasingly impactful. Several of our research projects focus on this development. We are exploring how platforms and sharing models might lead to new collaborations and retail offerings, but also how new actors such as influencers, payment providers, technology platforms, and gig workers are entering and transforming the retail ecosystem.

SUSTAINABLE RETAILING

One of the largest challenges the world is facing is that of sustainability, and the retail sector has a crucial role to play. In several of our research projects, we focus on how retailers can change consumer behaviors into more sustainable ones, for example by purchasing products with ethical and/or green labels, reducing carbon emissions and consumption of disposable packaging, and transitioning to more healthy and sustainable protein sources. We also conduct research on how decisions related to environmental and social sustainability are made in organizations and what is needed to enhance them.

INNOVATIVE RETAIL EXPERIENCES

Digitalization and sustainability are not only reshaping the retail industry, but also the experience offered to consumers. As algorithms are becoming increasingly powerful agents in retail, data-driven decision making* and automation will be a core part of the retail experience. Several of our projects are following this development, both from a customer and employee perspective, and thus contributing novel insights on how innovative retail experiences can be shaped.

THE PEOPLE OF RETAIL

Several of our projects bring the focus back to the people of retail: those on the shop floor, those helping customers, those delivering packages. Our research explores the changes that effect workers in organizations in a changing retail landscape: How does technology affect how people acquire new competences and engage with employees? How do employees engage with each other in ways that effects their commitment to organizations? And what are the new ways that retail organizations can engage with the people (employees, customers, stakeholders) in retail?

MANAGING NEGATIVE EVENTS

Research often focuses on what makes business more successful but understanding and mapping the consequences of negative events is also important. In this research, we collaborate with firms and regulators to provide insight into negative events in customer-firm relationships, such as product recalls, service failures, and product returns. We also investigate how to deal with negative events within an organization, such as unethical employee behavior or crises. Providing firms and regulators with empirically grounded insights contributes to a better understanding of how to manage negative events.

Find out more about or research on www.hhs.se/cfr

