

# When AI meets your shopping experience it knows what you buy - and what you ought to buy

By [Michael Milford](#) and [Gary Mortimer](#)

29 Oct 2018

Whether you do your shopping online or in store, your retail experience is the latest battleground for the artificial intelligence (AI) and machine learning revolution.



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Major Australian retailers have begun to realise that they have a lot to gain from getting their AI strategy right, with one currently recruiting for a [head of AI and machine learning](#) supported by a [team of data scientists](#).

The newly developed Woolworths division [WooliesX aims to bring together](#) a diverse group of teams, including technology, customer digital experience, e-commerce, financial services and digital customer experience.

## All about crunching the data

To understand the opportunities and threats for all major retailers, it's useful to understand why artificial intelligence is back on the agenda. Two crucial things have changed since the initial forays into AI decades ago: data and computing power.

Computing power is easy to see. The smartphone in your hand has [millions of times more computational power](#) than the bulky computers of decades ago. Companies have access to almost unlimited computing power with which to train their AI algorithms.

The other critical ingredient is the scale and richness of data available, especially in retail.

Artificial intelligence systems – especially learning techniques such as machine learning – thrive on large, rich data sets. When [fed appropriately](#) with this data, these systems discover trends, patterns, and correlations that no human analyst could ever hope to discover manually.

These machine learning approaches automate data analysis, enabling users to create a model that can then make useful predictions about other similar data.

## Why retail is suited for AI

The rapidity of AI deployment in different fields depends on a few critical factors: retail is particularly suitable for a few reasons.

The first is the ability to test and measure. With appropriate safeguards, retail giants can deploy AI and test and measure consumer response. They can also directly measure the effect on their bottom line fairly quickly.

The second is the relatively small consequences of a mistake. An AI agent landing a passenger aircraft cannot afford to make a mistake because it might kill people. An AI agent deployed in retail that makes millions of decisions every day can afford to make *some* mistakes, as long as the overall effect is positive.

Some smart robot technology is already happening in retail with [Nuro.AI partnering with grocery behemoth Kroger](#) to deliver groceries to customers' doorsteps in the United States.

But many of the most significant changes will come from deployment of AI rather than physical robots or autonomous vehicles. Let's go through a few AI-based scenarios that will transform your retail experience.

## Your shopping habits

AI can [detect underlying patterns](#) in your shopping behaviour from the products you buy and the way in which you buy them.

This could be your regular purchases of rice from the supermarket, sporadic purchases of wine from the liquor store, and Friday night binges on ice cream at the local convenience store.

Whereas inventory and sales database systems simply track purchases of individual products, with sufficient data, machine learning systems can [predict](#) your regular habits. It knows you like cooking risotto every Monday night, but also your more complex behaviour like the occasional ice cream binge.

At a larger scale, analysis of the behaviour of millions of consumers would enable supermarkets to predict how many Australian families cook risotto every week. This would inform inventory management systems, [automatically optimising stocks](#) of Arborio rice, for example, for stores with lots of risotto consumers.

This information would then be [shared with friendly suppliers](#), enabling more efficient inventory management and lean logistics.

## Efficient marketing

Traditional loyalty scheme databases like FlyBuys enabled supermarkets to identify your [frequency of purchase](#) of a particular product – such as you buying Arborio rice once a week – and then send an offer to a group of consumers who were identified as “about to buy Arborio rice”.

New marketing techniques will move beyond promoting sales to customers who are already likely to buy that product anyway. Instead, [machine learning recommenders](#) will promote garlic bread, tiramisu or other personalised product recommendations that data from thousands of other consumers has suggested often go together.

Efficient marketing means less discounting, and more profit.



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## Pricing dynamics

The pricing challenge for supermarkets involves [applying the right price and the right promotion to the right product](#).

[Retail pricing optimisation](#) is a complex undertaking, requiring data analysis at a granular level for each customer, product and transaction.

To be effective, endless factors need to be examined, like how sales are impacted by changing price points over time, seasonality, weather and competitors' promotions.

A well-crafted machine learning program can factor in all of these variations, combining them with additional details such as purchase histories, product preferences and more to develop deep insights and pricing tailored to maximise revenue and profit.

## Customer feedback

Historically, customer feedback was attained via feedback cards, filled out and placed in a suggestions box. This feedback had to be read and acted upon.

As [social media increased](#), it became a platform to express feedback publicly. Accordingly, [retailers turned to social media](#)

[scraping software](#) in order to respond, resolve and engage customers in conversation.

Moving forward, machine learning will play a role in this context. Machine learning and AI systems will enable for the first time bulk analysis of multiple sources of messy, unstructured data, such as [customer recorded verbal comments or video data](#).

## Reduction in theft

Australian retailers [lose an estimated A\\$4.5 billion annually in stock losses](#). The growth in [self-service registers is contributing](#) to those losses.

Machine learning systems have the ability to [effortlessly scan millions of images](#), enabling smart, camera-equipped point of sale (POS) systems to detect the different varieties of fruits and vegetables shoppers place on register scales.

Over time, systems will also get better at detecting all the products sold at a store, including a task called [fine-grained classification](#), enabling it to tell the difference between a Valencia and Navel orange. Hence there would be no more “mistakes” in entering potatoes when you are actually buying peaches.

In the longer term, POS systems may disappear completely, as in the case of the [Amazon Go store](#).

## Computers that order for you

Machine learning systems are [rapidly getting better](#) at translating your natural voice into grocery lists.

Digital assistants such as [Google Duplex](#) may soon create shopping lists and place orders for you, with [French retailer Carrefour](#) and [US giant Walmart](#) already partnering with Google.

## An evolving AI retail experience

As you move through life stages you get older, occasionally get unwell, you may get married, perhaps have kids, or change careers. As life circumstances and spending habits of a customer change, models will automatically adjust, as they already do in areas [like fraud detection](#).

The current *reactive* system involves waiting for a customer to start buying nappies, for example, to then identify that customer as having just started a family, before following up with appropriate product recommendations.

Instead, machine learning algorithms may [model behaviour](#), such as the purchases of folate vitamins and bio oils, then *predict* when offers should be sent.

This shift from reactive to predictive marketing could change the way you shop, bringing you suggestions you perhaps never even considered, all possible because of AI-related opportunities for both retailers and their customers.

## ABOUT THE AUTHOR

Michael Milford, Professor, *Queensland University of Technology* and Gary Mortimer, Associate Professor in Marketing and International Business, *Queensland University of Technology*

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