RETAIL

How AI can leverage value along the Customer Journey

Content

DIGITAL SUNDAI

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Introduction

The retail industry is constantly adapting to new customer demands and technological developments. Especially since the COVID-19 pandemic, the world drastically changed which led both customers and companies to move in the direction of a digitally first world. This impacts the **customer journey**, where customers expect to switch between channels effortlessly. New technologies can enable retailers to remove friction between channels and provide a better offering to existing and potential customers.

Next to improving customer satisfaction, most retail KPIs are focused on improving business performance. One of the technologies that are gaining popularity and can benefit both customer- and operation-focused KPIs is **artificial intelligence** (AI).

The purpose of this white paper is to provide a holistic view of how AI can provide value along the customer journey within the retail industry.

This white paper introduces a roadmap for selecting the right AI application for your retail firm

This white paper stems from academic research which uses papers and models created by leading researchers in the retail analytics field as a foundation. This uncovered a gap, where a practical and customer-centric angle can provide useful insights for the retail industry.

Therefore, this research analyses existing AI use cases by retailers worldwide to gain an understanding of the current situation. Qualitative research was performed by interviewing retailers about their AI strategy to gain more in-depth insights and create a framework that retailers can use to improve their AI utilisation.

The core of this research is built on the definition of 'AI-based retail innovation':

The use of new AI-powered technologies[1] to profitably[2] and sustainably improve individual customers'[3] shopping experiences across retail's different channels[4]

This resulted in the following concepts:

1. This research only looks into **AI** as a technology.
2. The use of this technology should improve profitability and customer experience, which is the **value** it can deliver.
3. The **customer journey** represents the individual customer. These customers can move between channels in every step of the customer journey.
4. It is important that they can do this without any friction. This is why the fourth concept is the **omni-channel** strategy.

Currently, retailers are still in the early stages of adopting AI which can be accelerated by providing guidelines for selecting the right AI applications. This white paper provides an overview of use cases which are mapped along the customer journey stages.

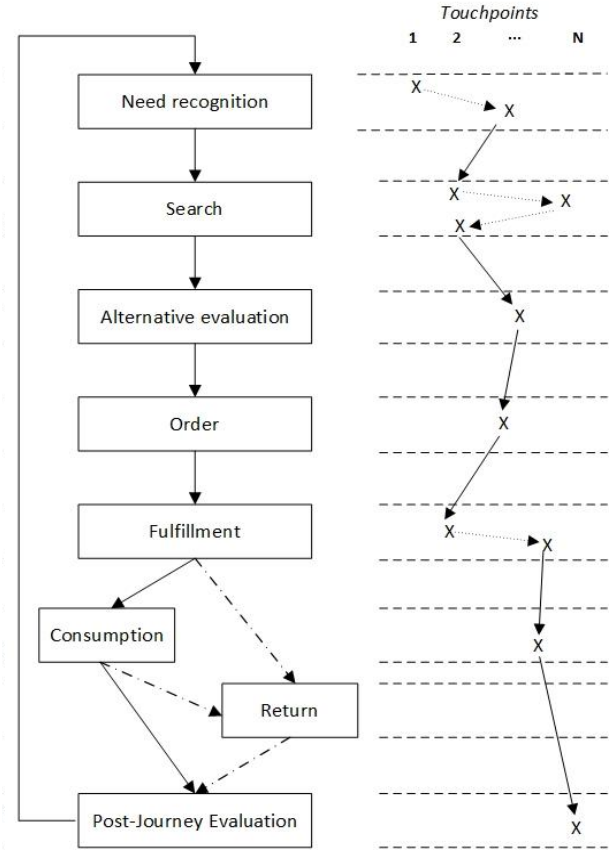
First, the customer journey will be explained, more specifically in the omni-channel environment.

Omni-channel customer journey

Nowadays it is inevitable for retailers to manage multiple channels, where **89%** of customers use multiple channels to purchase something and **42%** want a seamless experience when moving between channels. This led to the concepts of **New** or **Unbounded Retail***, which merges channels and uses technology to create a seamless experience. This strategy is customer-centric and data-driven, resulting in a holistic customer experience and improved business efficiency.

The customer journey is visualised in the figure below, next to an example of a possible omni-channel route. The more channels a customer touches during their journey, the less control a firm has over the customer journey.

After fulfullment (receiving the product) there can be several paths, where the product can be consumed and/or returned. Evaluation is an optional stage, where feedback can be given. Loyal customers can repeat the process with the same company or switch to a competitor.

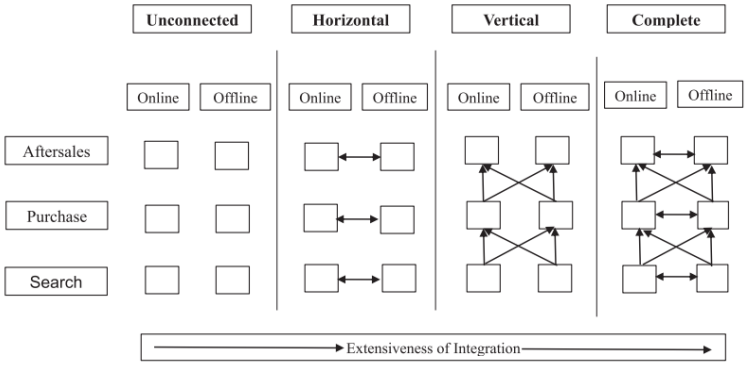


Source: Rooderkerk R.P. & Kök A.G. (2019). Omnichannel Assortment Planning.

*Alibaba introduced the concept of 'New Retail', which merges online and offline channels in retail, plus uses big data technology to create a single value chain.

JD has a similar concept with 'Unbounded Retail', merging channels, supply chains and marketing efforts to create a seamless experience where customers can be targeted efficiently.

This shifting of touchpoints means that the customer journey is a **dynamic process** rather than a linear one. Retailers can choose different strategies for managing these touchpoints, where the ultimate omni-channel strategy entails a coordinated use of all channels, in all stages of the customer journey.



Source: Neslin, S. A. (2022). The omnichannel continuum: Integrating online and offline channels along the customer journey.

The above image shows different channel management strategies. The 'complete' strategy works both *vertically* (continuing or switching channels along stages) and *horizontally* (integrating online and offline channels per stage) on the customer journey. This can be seen as the **ultimate omni-channel strategy**.

The complexity of this strategy asks for a customer-centric approach, where the customer journey can be used as the focal point.

Interview results

45% use the customer journey as a focal point

Product offering type influences channel navigation

About half of the interview participants mentioned a switch to a more **customer-centric approach**, where the customer journey is an important starting point in their new strategy. The others focus more on operational efficiency.

It is interesting to note that customers navigate differently through channels depending on the **product offering**. Channel management and especially offline channels are essential for complex products such as kitchens, with high risk when things go wrong, both for the company (e.g. high costs) and the customer (e.g. long waiting times).

AI can manage these journeys and create personalised experiences, to be able to better respond to changing customer demands and ultimately lead to enhanced business performance.

Omni-channel can be defined as: "the synergistic management of all customer touchpoints and channels both internal and external to the firm, to ensure that the customer experience across channels as well as firm-side marketing activity, including marketing-mix and marketing communication (owned, paid, and earned), is optimised for both firms and their customers"

AI technologies

AI is an umbrella term that includes other technologies. In today's world, AI can be divided into subsets of Machine Learning (ML) and Deep Learning (DL).

These overarching technologies are being applied in numerous other technologies. The main technologies that are being applied by retailers are:

- Natural Language Processing (NLP)
- Computer Vision
- Robotic Process Automation (RPA)
- Predictive analytics
- (physical) Robotics

Nowadays, retailers must stay up to date with applying technologies to remain competitive. To ensure this **competitive advantage**, companies should consider three elements:
1) Improve the customer experience
2) Reduce costs
3) Increase revenue and business profitability.

AI is a fitting technology to achieve these elements, where it is expected that the most value impact derived from AI will be noticed in the **retail industry**. This is due to a large amount of customer data (both transactional and personal data) and information from external sources such as social media that augments this data. The next section will dive deeper into AI's potential to create value.

Value for Retail & AI

In order for a retailer to implement the right AI solution, AI applications need to be prioritised based on their (potential) value. The path to value is conceptualised by the value creation logics of Cao[1], with the purpose to enhance business performance.

The value creation logics consist of 4 different categories, ranging from an operational to a strategic perspective.

1. **Value creation via business automation**
   Usually by improving efficiency in business processes, where the most benefit can be gained through RPA and predictions.

2. **Value creation by offering hyper-personalised products and services**
   AI applications can look into an individual's needs and adapt towards them, to create a hyper-personalised experience and consistency across channels. This will benefit marketing and communications across channels, where language-based AI can provide the best solution.

3. **Value creation by creating synergy through complementarity**
   This entails that AI technologies operate with other resources (e.g. employees, customers and other

[1] Cao, L. (2021). Artificial intelligence in retail: applications and value creation logics.

technologies) which creates synergy and thus more value. This can be most noticed in-store, where staff can use AI to provide better services, which improves customer experience.

4. **Value creation by enabling innovations**

This can be innovations in products, services, new channels or business models. It can cover all technologies and all domains since this is a more strategic value creation and impacts the entire organisation.

The table below provides an overview of the value creation logics and corresponding technologies that generate the highest value.

Value creation logic	Retail domain	AI technology
Automation	Supply chain, Merchandise management	RPA, Predictive analytics
Hyper personali-sation	Marketing, Store operations	NLP
Comple-mentarity	Customer service, Store operations	Computer vision, Robotics
Innovations	All retail domains	All technologies

This value creation can lead to benefits for both the business and the customer. When measuring **business performance**, common metrics are return on investment, cost reduction or increased efficiency. On the customer side, using AI applications can lead to a more personalised approach where companies can respond better to consumer needs. This leads to **customer-level perceived benefits** such as convenience, relevance, and monetary or ecological savings.

A global study by Capgemini[2] interviewed 1000 organisations and spoke with academics about AI implementation. Three-quarters of respondents saw an increase in sales and operational efficiency by more than 10%, while also increasing customer satisfaction (measured by Net Promoter Score) by 10%. This highlights that AI can benefit both the company and the customer simultaneously.

After adopting AI, 75% see an increase of 10% in sales and customer satisfaction

However, many retailers are not at their desired AI adoption level, which will be further discussed in the next section.

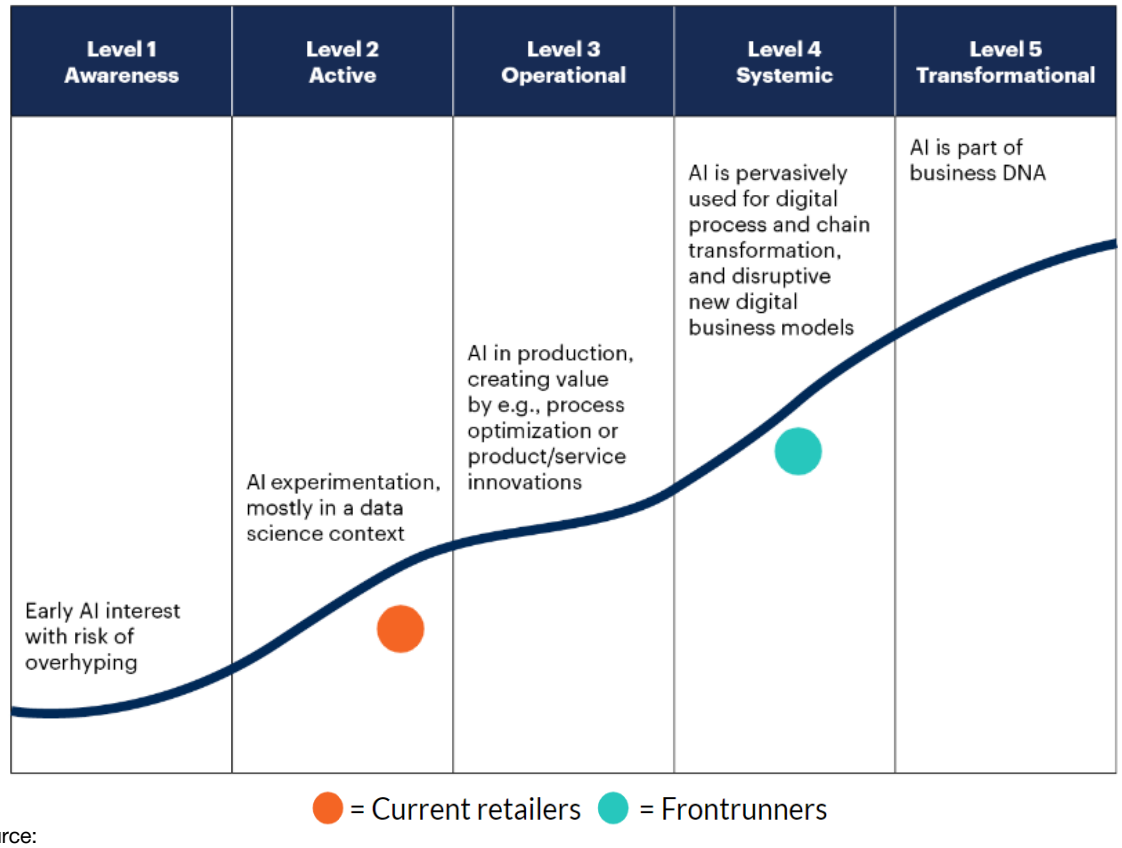
[2] Capgemini. (2019). Impact of AI for Customer Experience.

AI Adoption

Many companies have started adopting AI into their operations but have not fully implemented it throughout the customer journey. The adoption of AI can have several maturity levels, which are represented in the **AI maturity model** by Gartner.

When looking at the maturity model below, current retailers are preparing themselves and starting with implementing small AI experiments, which belongs to level 2.
There are several frontrunners such as Amazon that are using AI in their core operations, which belongs to level 4 or 5.

In order to adopt AI, a company should explore **current best practices** and adopt this into their strategy to progress in the maturity model. Using business practices through **use cases** is a suitable technique to uncover these practices and implement the learnings throughout the company's strategy.



Source:
https://www.gartner.com/smarterwithgartner/the-cios-guide-to-artificial-intelligence

Interview respondents mentioned that they are willing to and working on improving AI adoption, however, the barriers to adoption are refraining them from achieving the desired adoption level. Below is a summary of the most important factors that can **enable adoption**:

+ Data architecture
+ Availability of resources
+ Innovative company culture
+ Availability of use cases
+ Government support
+ Competitive pressure

This is based on the **TOE-framework**, which stands for Technology, Organisation and Environment.

Technology

In order to implement AI, a company's data architecture and data quality should be optimised. This can include centralising data sources, using cloud solutions and improving test and training data sets. The interviews taught us that the best strategy is not to wait for perfect data. Ideally, a company experiments with AI and simultaneously improves data to reach better results faster.

Organisation

An innovative company culture that values a data-driven strategy and uses experimentation proves to be one of the main enablers of AI adoption. Other resources such as staff, knowledge and time are also necessary to adopt AI. If these are unavailable, retailers can choose to purchase fixed AI solutions or adopt a hybrid solution, where parts of the technology are bought, but adapted to fit the specific company's needs.

It seems to be an organic process where a company starts small, focusing on smaller KPIs and low-hanging fruit, growing their technological expertise and resources, before moving to a strategic level (which matches the value creation logic perspectives). Identifying relevant use cases is beneficial for seizing the right AI opportunities aligned with business goals. The retailer roadmap on page 10 provides guidance on how to tackle this.

Environment

A competitive environment pushes retailers to 'follow the herd' where AI can be utilised to gain or maintain competitive advantages. Use cases of competitors provide best practices and can inspire the adoption of new AI applications.

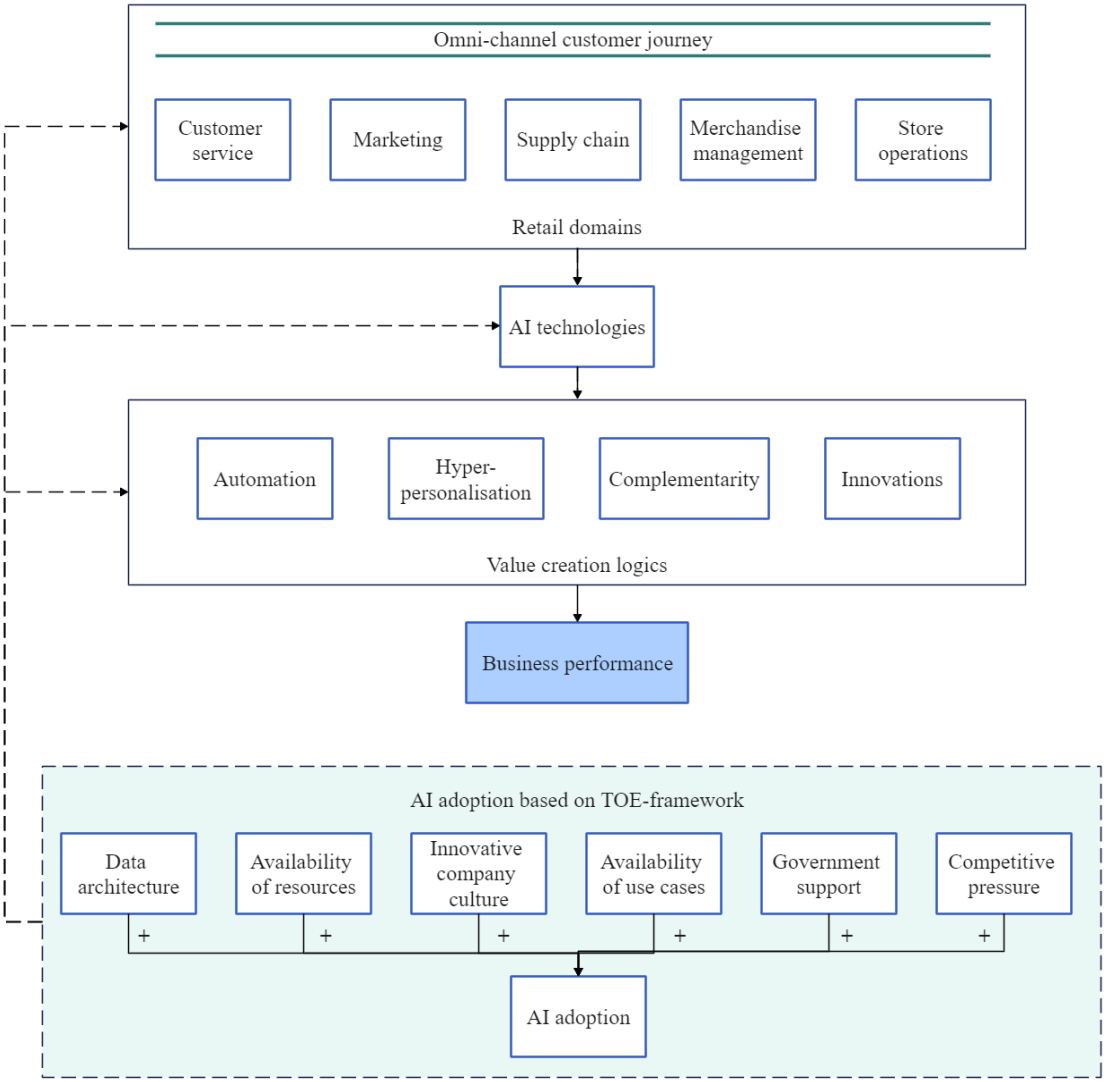
AI adoption can be further strengthened by government investments and lenient regulations, which can be seen in countries such as China and the United States where many investing initiatives are put in place to increase AI adoption by national companies.

Theoretical framework

Since this white paper stems from academic research, a theoretical framework was made to visualise the process from customer journey to enhancing business performance.

As mentioned before, the customer journey is used as a focal point in determining a company's AI strategy. The KPI that a company wants to address can be in a specific retail domain. Then, an AI application can be selected that can provide a solution through one of the value creation logics, that ultimately will lead to enhanced business performance.

Below, AI adoption is included as a **moderating variable**, which means that the adoption level of a company moderates the effect of the process described in the previous paragraph. When barriers to adoption are resolved, it will be easier for a retailer to implement AI. The adoption is based on the TOE-framework, where data, company culture, resources, use cases, support and competitive pressure can enable retailers to adopt AI. Therefore, these variables have a **positive effect** on adoption when utilised properly.



Retailer Roadmap

This roadmap is created for retailers that want to include AI into their strategy, with a focus on the omni-channel customer journey. It is organised as a step-by-step guide where use cases need to be prioritised according to company-specific KPIs. It does not provide an implementation guide, since this is outside of the scope of this research and dependent on specific business goals and strategies.

Step 1: Need formulation

It all starts with creating an understanding of the need. This can be a need by the customer, where a company wants to respond to it by improving or creating new offerings. The need can also come from the company, where it can concern increasing revenue/sales, reducing costs or improving operational efficiency.

Example: we have problems in our stores with inventory, we want to make sure our customers can find the right product when comparing alternatives, but we struggle with having too much in stock.

Step 2: Setting up KPIs

In step 2, the needs formulated in step 1 will be translated into measurable KPIs. This ensures that the chosen solution will match a company's strategic vision, increasing the chance of successful adoption and lowering the investment risk.

Example: we want to improve inventory turnover ratio by 10% before Q3 2023.

Step 3: Pinpoint the concerning domain

After selecting relevant KPIs, the next step is to pinpoint which domain it concerns. This can be in the following retail domains: Customer service, Marketing, Supply chain, Merchandise management or Store operations.

Example: inventory concerns merchandise management.

Step 4: Enhancing feasibility

Now it is clear which department will go through a transformation, so the next step is to assess the current situation and what is missing to achieve your goal. These barriers can concern:

- Data: improving quality, centralising data, and creating data architecture.
- Technology: other technologies or programs that need to be put in place.
- People: improving skills, hiring new employees or working with external parties.
- Ethics: putting regulations in place to be able to deploy AI.

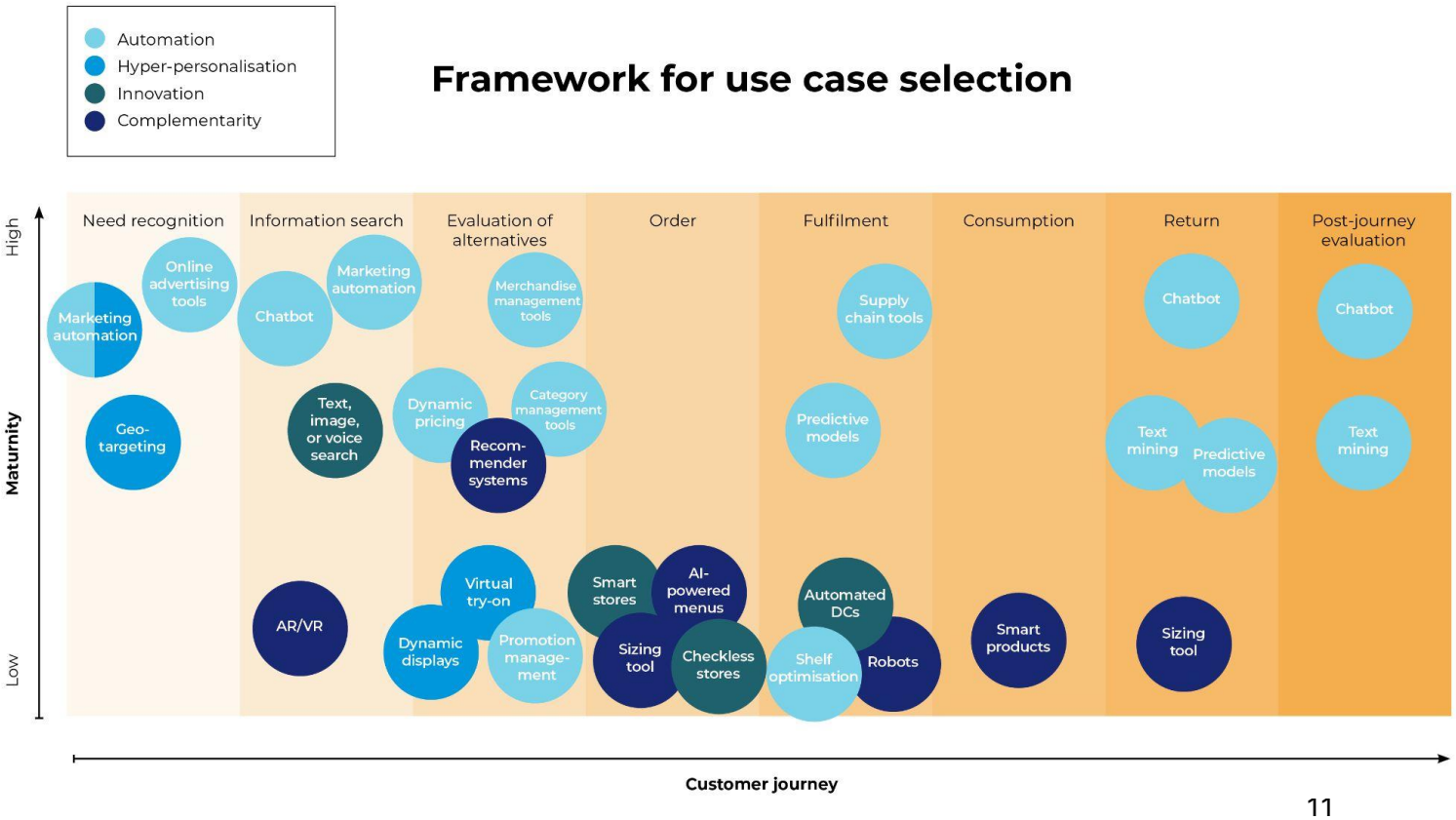
However, this does not need to be fully completed before starting with use case selection and implementation. When a minimum level of feasibility is achieved, the best practice is to start improving the foundation and implement AI simultaneously. This will reduce the length of the project, making it a less costly and risky investment.

Example: we need to improve our inventory data and hire a data analyst that can manage this task.

Step 5: Selecting the right use case
Now it is known what business objective needs to be reached, which domain it includes and what is necessary to implement AI. The next step is to select the right use case. This can be one or multiple, depending on the KPI.

The image below provides a framework, where AI applications are organised per customer journey stage along the horizontal axis. The vertical axis shows the maturity of the application in the current retail industry, where for example a chatbot is highly adopted. The colours of the circles represent the corresponding value creation logic, which is how the application can generate value for the company.

Example: customers browse our inventory during the 'Evaluation of alternatives' stage, where an inventory tool provides a good solution. This is an online tool that creates value by automating the inventory process. This tool is highly adopted by retailers.



Step 6: Prioritising use cases
When multiple use cases are selected to reach the KPIs, they should be prioritised based on their potential. Recommended is to start with 'low-hanging fruit', which are the use cases that are easy to implement, do not require additional resources, have low implementation costs, et cetera.

Step 7: Implementing the use case
The implementation depends on the use case. However, implementing AI is not something that happens once. It is an iterative process, which requires experimentation, including new learnings to improve the AI system.

The role of the manager

One of the main findings of this research is that the **lack of executive support** and **company culture** is the main barrier to adopting any type of AI application. This is due to a lack of information and practical examples of how it can be implemented. This white paper provides a solution by offering a practical roadmap that gives retailers guidance on how they can start implementing AI applications.

Conclusion

Ultimately, a core benefit of AI is its **power to predict**. Especially in the near future, retailers will move to a predictive or autonomous level of analytics.

Also, customers want a **personalised approach** so there is a need for retailers to switch to a customer-centric strategy. AI can help retailers in getting to know their customers. Customer information can be used to **segment customers** and provide tailored services, focusing on profitable segments.

AI can increase customer loyalty and customer satisfaction. On the other side, AI also helps to make **business processes** more efficient.

The **omni-channel customer journey** can be the focal point where AI can be used to manage journeys more efficiently and provide unique experiences.

With help of the use case framework, retailers can decide the application most fitting with their **KPIs** to ultimately enhance business performance.

About the research

This research is conducted by Marloes Slotboom as her Master thesis for the MSc Business Information Management at Erasmus School of Management. After in-depth research of AI within retail, primary data was collected through expert interviews where Dutch retailers were interviewed in April and May of 2022.

About the collaborators

Digital Sundai

Digital Sundai strives to improve the performance of organizations through Digital and AI. Founded in 2019 in Amsterdam Digital Sundai is a company providing Digital & AI solutions and consultancy. The founder Robin Zondag is a digital and AI service industry veteran of more than 20 years supporting corporate customers to improve their performance.

Erasmus Centre for Data Analytics

The Erasmus Centre for Data Analytics' purpose is to explore data analytics, enhance data knowledge, and find business and societal uses for data analytics and AI to benefit from digital transformation. More specifically, the Retail Analytics Expert Practice contributed to this research.