

## 7.5: Investing in IT for Competitive Advantage

In 2008, Brynjolfsson and McAfee published a [study in the Harvard Business Review](#) on IT's role in competitive advantage, titled "Investing in the IT That Makes a Competitive Difference." Their study confirmed that IT could play a role in competitive advantage if deployed wisely. In their study, they draw three conclusions:

- **First**, the data show that IT has sharpened differences among companies instead of reducing them. This reflects that while companies have always varied widely in their ability to select, adapt, and exploit innovations, technology has accelerated and amplified these differences.
- **Second**, good management matters: Highly qualified vendors, consultants, and IT departments might be necessary for the successful implementation of enterprise technologies themselves, but the real value comes from the process innovations that can now be delivered on those platforms. Fostering the right innovations and propagating them widely are executive responsibilities that can't be delegated.
- **Finally**, the competitive shakeup brought on by IT is not nearly complete, even in the IT-intensive US economy. We expect to see these altered competitive dynamics in other countries, as well, as their IT investments grow.

In the tech-driven and ever-changing business landscape, successfully leveraging and implementing IT has become the solution for maintaining competitive advantage and growth. One such solution is artificial intelligence (AI).

### 7.5.1: Artificial Intelligence (AI)

Today, artificial intelligence has emerged as a new technology that can provide opportunities like personalized recommendations, fraud detection, process automation, and data insights. Companies like Amazon have successfully leveraged AI for competitive advantage. This shows that IT-driven impacts continue to evolve.

However, human innovation and management remain essential. The right innovations must be fostered and propagated through good leadership. With the reliance on IT systems and data, security has also become crucial for operations and competitiveness.

Artificial intelligence (AI) is intelligence demonstrated by machines, as opposed to intelligence displayed by humans and animals. We discussed AI in Chapter 3. Let's review what it is and how it is used in our daily life.

#### Definition: Artificial Intelligence

Artificial intelligence (AI) refers to computer systems or software that can perform tasks normally requiring human intelligence, such as visual perception, speech recognition, and decision-making. AI leverages large amounts of data and complex algorithms to mimic human cognitive skills in an automated manner. It is used in applications like digital assistants, image analysis, autonomous vehicles, and fraud detection.

Let's watch this short video by The Royal Society, [What is Artificial Intelligence?](#), that explains what AI is and its role and impact in society.



Figure 7.5.1: Technology with AI at its heart has the power to change the world, but what exactly is Artificial Intelligence? (The Royal Society; [The Royal Society via https://youtu.be/nASDYRkbQIY](https://youtu.be/nASDYRkbQIY))

AI (or machine intelligence) - machines' ability to operate like a human brain - to learn patterns, provide insights and even predict future occurrences based on inputted data/information can give companies a competitive edge in marketing by providing insights into how to market, who to market to, when, and how to market. AI offers insights that are objective and data-driven. For example, Amazon uses AI to follow users' behavior on their website - what type of products they buy, how long they spend on a product page, etc. The AI system quickly learns to generate tailored recommendations to each user's taste and preference based on their activity. Another advantage of AI is in cybersecurity and fraud protection. AI technologies can use user behavior data to identify and flag any activity that is out of the ordinary for any user (such as credit card use outside your home state). AI systems are very versatile in that they can handle all three types of decisions - structured, semi-structured, and unstructured.

#### Sidebar: AI in daily life

AI can be found everywhere today. It is difficult to imagine our daily routines without the help of AI. Check out this neat infographic from Caltech science exchange: [How is AI applied in everyday life?](#)

AI is used by smart assistants like Alexa, Siri, Bixby, Google Assistant, Cortana. Your phone's facial recognition also uses AI. Social media platforms such as Facebook, Twitter, and Instagram use AI to personalize your feeds, suggest friend requests, and identify and filter out fake news. Netflix's powerful AI uses your past viewing history to deliver suggestions for what you might want to watch including genres, actors, time periods, and more. It even makes suggestions based on what time of the day you are watching and what you traditionally watch during that timeframe!

AI is used by Grammarly, Smart Compose in Gmail, to check your spelling and grammar. A prominent example is ChatGPT, an AI powered large language model chatbot that can be used to write blog posts, give recipes, generate and debug complex code, write papers and essays, weave vivid stories and answer almost any question you would ask it. In 2023, academy introduced "Khanamigo", an experimental AI powered guide based on GPT-4. Check out Sal khan's introducing "Khanamigo" in [this video](#).

Credit card companies use AI to verify if a purchase is within your normal transaction and purchase patterns, and if not send you a fraud alert or even decline transactions. Amazon uses AI algorithms to learn what you like and what other people who are like you purchased to deliver recommendations for what you might like to buy. Many companies and retail stores such as H&M use AI chatbots to provide customer support.

GPS navigation systems use AI to monitor traffic and give you real-time traffic and weather conditions as well as suggest detours. This led to the new industry - ride share apps. Uber and Lyft have become very popular and they use AI to resolve the conflicting needs of drivers and passengers. AI is at the heart of the push towards self-driving cars. Tesla's autopilot function uses AI to navigate roads, highways and parking lots without human intervention. At the time this was written, the city of San Francisco granted Driverless Cruise and [Waymo permits](#) to offer and charge for robotaxis - fully autonomous vehicles.

### ? Use Case - How Spotify uses AI to gain competitive advantage 7.5.1

**Problem:** Spotify wanted to better understand users' musical tastes and preferences to provide more personalized recommendations and increase engagement on their platform. However, manually curating playlists tailored to each of their over 286 million users is not feasible (Spotify Technology S.A., 2022). How can Spotify use AI to solve this problem?

#### **Answer**

Spotify used artificial intelligence algorithms to dissect attributes of songs and match them to each user's listening habits. The AI recommendation engine analyzes parameters like genre, tempo, key and previous playlists to determine similarities. It then suggests new artists, albums, and playlists tailored to each user. This context-aware recommendation functionality based on AI has driven increased engagement. The strategic use of AI-powered personalization has given Spotify a competitive advantage in user satisfaction and retention.

## 7.5.2: Global Competition

Many companies today are operating in a global environment. In addition to multinational corporations, many companies now export or import and face competition from products created in countries where labor and other costs are low or where natural resources are abundant. Electronic commerce facilitates global trading by enabling even small companies to buy from or sell to businesses in other countries. Amazon, Netflix, Apple, Samsung, LG, and many more have customers and suppliers worldwide.

### ? Use case - Global Banks fight cybercriminals 7.5.2

**Problem:** Banks and financial firms process millions of transactions daily from locations worldwide. As cybercriminals become more sophisticated, fraud detection is extremely challenging when transactions originate globally. Manual review cannot keep up with massive global volumes. How AI can help?

#### **Answer**

Banks use AI software that can analyze millions of data points in real-time and detect subtle patterns indicating fraud. By applying machine learning algorithms, the AI can quantify risk on each transaction and flag suspicious ones for further review.

Applying AI to massive global datasets has become essential for financial firms to combat fraud, cybercrime, and manage risk worldwide.

## 7.5.3: References

McAfee, A. and Brynjolfsson, E. (2008). *Investing in the IT That Makes a Competitive Difference*. Harvard Business Review. Retrieved August 16, 2020, from <https://hbr.org/2008/07/investing-in-the-it-that-makes-a-competitive-difference>

The Royal Society. (2018). [What is Artificial Intelligence?](#) YouTube. [video file: 2:31 minutes] Closed Captioned.

Spotify Fourth Quarter 2021 Earning Report. Retrieved September 2, 2022 from [Spotify.com](https://spotify.com).

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