

Best of Business AI

Mondelēz International case study

With a portfolio of recognizable brands that includes everything from *OREO* cookies and *Toblerone* chocolate to *RITZ* crackers and *Trident* gum, Mondelēz International is one of the world's leading snack companies. Founded in 2012 as the successor of Kraft Foods, Mondelēz International has a market of over 150 countries and offices in 80.

As it looks to the future, one of its primary goals is to become a digital-first company. AI is a key part of this overall digital strategy. According to Eugenio Alvarez Ibarquengoitia, Head of North American Engineering Process, Control, and Information Systems, "Mondelēz International has really high expectations to be leading the way on digital because we see that digital and AI are going to provide competitive advantage. There's value in agility, there's value in the speed of response that AI enables."

With AI and other digital initiatives, Mondelēz International sees the opportunity to become more nimble in many ways, for everything from R&D to marketing. AI is helping not only accelerate existing operations but also transform the business to better meet consumer expectations and increase competitiveness.

Establishing the right approach to drive AI and digital success

Establishing data governance

Mondelēz International recognized from the beginning that data strategy would be key to success with AI. According to Javier Polit, Chief Information and Integrated Business Services Officer, "Without data, you can't have good machine learning; without machine learning, you can't have good AI; and without good AI, you're not going to get the transformational insights that you need."



Fortunately, Mondelēz International has plenty of data, from financial and advertising information to supply chain data.

They needed to thoughtfully consider how to organize that data to make it as valuable as possible. Jonathan Halvorson, VP of Global Media, explains, "No matter what application of AI or machine learning you want to do, it all starts with the foundation of being clear on what data you want to own, how you're going to govern it, what its taxonomy will be and how you put it in place. Building that taxonomy and governance has been arduous. It was a process that took 18 months, thinking about all the variables we wanted to have in a taxonomy, because a taxonomy is something that lasts in perpetuity. But we needed to have a common taxonomy to govern all of that information. Otherwise, it's worthless." Today, Mondelēz International has a data taxonomy with over 40 variables, making the data easily usable for AI models and other analytics.

Selecting the right use cases

Mondelēz International starts AI and digital projects by focusing on a real business problem. Joe Manton, Director & Global Head of Modeling, Simulation and Data Sciences, explains, "The most important thing is actually to identify some real business need, a business imperative"—in other words, to apply AI where there's already an appetite for change.



Vishal Jain, Associate Director of Data and Analytics for Supply Chain & RDQ, recommends starting “with the low-hanging fruit, the examples that bring immediate business value.” Demonstrating success helps inspire leaders to support future AI initiatives.

Creating teams with business and technical experts

AI development is most successful when AI experts collaborate with peers across the organization. Rob Hargrove, Executive VP, Research, Development, and Quality, explains, “On one side we have our data science, modeling, and simulation experts. On the other we have our biscuit, chocolate, gum, or candy development experts in our product teams. Neither side knows the other's job perfectly. So they know they can't work in siloes because then neither side will be successful.”



Mondelēz International has put a lot of thought into what stakeholders need to be involved in a digital project to make it a success. They've developed what they call the “modeling triad,” a set of three roles that are required to drive the project.

- The first corner of the triad is a subject matter expert from the product team. According to Manton, “This is someone from one of the project teams who understands the technical challenge or the decision that needs to be made. Where are the greatest opportunities? Where do we have our toughest challenges? Where do we spend a lot of time and effort and money, time after time, project after project? These are the areas that are richest for opportunity.”
- The second corner is a data scientist or modeler who can create the necessary model.
- The third corner is someone who can provide the necessary data—this could be from different functions like analytics or IT.

Mondelēz International enables the “modeling triad” by embedding data scientists or modelers in each of its categories and core functions. Manton warns against diverging from this approach: “From my experience, I have seen situations where due to resource constraints or cost restrictions, people have tried to cut off one of these corners and it just brings stress and strain and ultimately leads to a lower level of success.”

Gaining and sustaining employee buy-in

Mondelēz International has found that getting buy-in across the organization is one of the most important success factors. According to Alvarez Ibarguengoitia, “Just because we installed the technology, that doesn't mean the people are ready to use it. That's one of our biggest challenges. Sometimes we have to work more with the people than with the technology to ensure successful adoption.”



Buy-in first becomes necessary when gathering data to train AI models. Mondelēz International needed cooperation from those closest to operations to obtain existing data or begin collecting new data. This wasn't easy: Manton explains that these teams “were up against tight timelines and for us to say ‘would you also fill out the data in these sheets’ was too much of an ask.” But, Manton continues, “Once you've got them on board and understanding personally the value they will get from AI, the collection of data and the desire to structure it comes a lot more readily.”

Mondelēz International also needed buy-in from stakeholders to ensure adoption of the AI solutions. Andrew Carlos Kondlatsch, Powder Fundamentals Engineer - Global Beverages, explains, “Implementation of artificial intelligence within our reality implies changing protocols and guidelines that we have always used.” Often employees are resistant to these changes. As Hargrove puts it, “When people are using

different methods to get to their results, which they're highly invested in, they have nervousness around change.”

Mondelēz International takes a few approaches to earn buy-in:

- The first is to make sure that individuals understand the value a new solution will provide for them personally. According to Jain, “In most of the use cases we've been able to help the individual understand what's in it for them, how this new capability is going to help accelerate their work and supercharge their skills.”
- The second is a compelling story from leadership. Jain explains, “The more leaders talk about the journey we are on, the support they are providing, the vision they have, and using data and analytics, machine learning, and AI capabilities within the company, there will be more of a push for individuals who are reluctant to come on this journey as well.”
- The third is hearing from peers about their successes with AI and modeling. Mondelēz International has created success stories that, according to Dale Kyser, VP of Research and Nutrition Sciences, “showcase the person at the next desk, how they use these tools to do a better job of delivering against the business needs, of delivering against what our consumers want, doing it faster or cheaper, better. Those peer-to-peer success stories are far more compelling than anything that I could do.”

Implementing training

In addition to getting their buy-in, it's equally important to train employees that will be acting on AI recommendations. Mondelēz International started with general training to “elevate digital fluency and data literacy,” explains Polit. They even created a “reverse mentoring program” to ensure the executive team is familiar with AI technologies being used at the company.



Culture

For each new solution, Mondelēz International trains employees whose work will be impacted. Alvarez Ibarquengoitia says that training is essential because employees “need to understand and really learn how to adapt to and use the solution.” He explains why this is necessary through the example of AI-enabled predictive maintenance: “Artificial intelligence is telling you go and stop this machine and do maintenance, and we need to have a skilled maintenance team that knows how to act on the AI recommendation to successfully prevent a breakdown. Otherwise we won't get the desired result, even though we have the right technology and the right artificial intelligence recommendation.”

Bringing AI to everyone

Since they started working with AI and other digital tools, Mondelēz International has aimed for them to be used broadly, at all levels of the company, not just by a select few. Kyser explains, “We have a core of digital experts. We're building a group of advanced users. Then we're building a broader group of users. The question regarding this broader group is, how do you democratize the technology in a way that makes it easy for them to use?” The goal is ultimately to bring AI to everyone across the company.



AI for everyone

Mondelēz International has already succeeded in bringing AI to non-AI experts in areas like food science. Alexia Ciarfella, Associate Scientist for *OREO*, explains, “Something I think we're doing right as an organization is deliberately putting AI in the hands of the problem-solvers and the people closest to the business problems. I'm not a software engineer, I'm not a computer scientist. I'm a food scientist, a product developer, trying to make snacks that delight our consumers. And I'm still working with AI.”

One advantage of bringing AI to non-AI experts is that Mondelēz International has been able to equip employees with knowledge that otherwise would have taken years to develop. Ciarfella explains, “I found the AI approach really helpful as a training tool or skill equalizer across product development. Every product developer can be as effective as the most expert product developer. They’re benefiting from the internal expertise that we have but without all the training.”

Ciarfella’s use of AI is enabled by Mondelēz International’s AI platform for product developers. Jain explains the impetus for this platform: “We have to have the right platforms so the models and initial use cases don’t just remain on a few laptops or machines but can be used globally. As we commercialize the usage of these models throughout the business, the platform we create can be used for other parts of the business as well.”

And non-AI experts are finding that AI has a big impact on their success. Maria Galindo, Associate Principal Scientist for consumer science, explains how AI has impacted her field: “With traditional consumer research tools we were able to reach a specific sample size because the more consumers you reach, the more expensive it is, and the more time it takes. With the use of AI, we can reach many more consumers in a fraction of a time and sometimes at a fraction of that cost. That’s been a very significant change for us.”

AI in action: Infusing AI in every part of the company

With the right foundation in place, Mondelēz International has been able to implement AI and other digital technologies across virtually every area of their company: R&D, marketing, manufacturing, supply chain, and even IT.

Developing a new product requires highly repetitive experiments where the product developer continually makes small tweaks to home in on the optimal recipe. Performing these physical experiments is time-consuming. Hargrove explains, “If you want to see how a biscuit recipe behaves in an oven, you can do a lot of physical trials where you put a lot of kilograms of raw materials into an oven and see what happens, or you can know what’s going on from a physics standpoint, from a heat and mass transfer standpoint, and you can collect the data to model that.” Mondelēz International uses AI to analyze the data and model the results of a recipe change. While some physical tests are still necessary, modeling significantly speeds up the development process, enabling new products to get to market faster and with less development cost and waste.

Mondelēz International is also applying AI to another side of R&D: consumer science. A traditional approach to understanding how consumers feel about products is through interviews. These interviews can be a huge strain on time and resources—first to perform them, and then to analyze the data. To speed up this process, Mondelēz International uses an AI-powered chatbot to conduct the interviews. It asks the questions, understands the consumers’ answers, and determines their sentiment. In some cases, the chatbot has not only accelerated the process but also produced more accurate data.

In marketing, Mondelēz International has a number of AI use cases. One is ad segmentation. As a company with brands that have massive penetration, Mondelēz International needs to shrewdly determine which segments to target in order to drive growth. According to Halvorson, “Machine learning applications help us look at large groups of audiences and clusters and help us identify the most profitable segments to focus our resources on.”

AI also enables ad personalization at scale. Halvorson says companies need to “deliver personalized messages to audiences at heroic scale. AI and machine learning are core competencies for realizing this

ambition. We want to produce not one commercial that we show everyone, but rather produce 60,000 variants and deliver that to each unique consumer of *CADBURY* chocolate in India. And we've reached that ambition because of the work we've done in data and technology." And personalization doesn't stop with marketing. Halvorson says that the work they've done in marketing has inspired other groups, such as the packaging team, to explore AI-driven personalization.

Finally, Mondelez International uses AI to optimize their ad mix: "We use AI and machine learning to help us understand the right mix of media partners, platforms, timing sequencing, so we're ultimately able to drive that net outcome in sales."

These marketing applications have paid off: Marketing ROI has seen an increase of 15% CAGR, a boost Halvorson attributes in large part to their work with machine learning.

These are but a few examples of how Mondelez International is applying AI. Mondelez International has realized that AI is a powerful tool for each area of the business and has worked to make it available to all employees. Other examples of AI implementations include predicting when machines used in food manufacturing will need maintenance, detecting defects in food products during production, optimizing packaging, predicting late payments and returns from retailers, and more.

Continuing the journey to digital maturity

In just a few years, Mondelez International has gone from being an AI novice to having a number of highly successful AI implementations across every area of their company.

Manton explains, "We began with a vision, a roadmap, and a plan to get from where we were to where we wanted to be."

Mondelez International understood that in addition to this vision they needed a plan that would encompass strategy, cultural change, and the democratization of AI. With this foundation in place, Mondelez will continue to mature as an AI-driven company in years to come and gain competitive advantage as a result.

For companies looking to get started with AI, Alvarez Ibarquengoitia's advice is don't delay: "The more you wait, the longer it's going to take you to see the benefits because it's a journey. It's not only the technology; it's also the education and the culture. The faster we start, the faster we start to change the way of working in the industry. If you have a need right now—and all businesses have a need to grow and improve—then you better start using these solutions."



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