

DX 2021

Moderna: Creating the world's first digital biotech

TWIMBIT DX RANKING 4

INSIGHTS FOR SUCCESS | IDEAS TO EXECUTE

April 2021

Twimbit DX Ranking 4



100%
Define



75%
Simplify



100%
Innovate



100%
Overall

moderna

Industry: Biotech

Revenue (FY20): USD 803.40 million

HQ: Massachusetts, United States

CEO: Stéphane Bancel

Purpose: Create and deliver on the promise of messenger RNA, or mRNA science, to create a new generation of innovative medicines for patients

Business model innovation:

mRNA and Deep tech



Outcome

Moderna recorded a thirteen-fold increase in its top-line in 2020. Approval of the company's novel coronavirus vaccine in much of the developed world is the core driver of this bump. Moderna has digitised its entire value chain to derive maximum leverage, resulting in more than 20 drug development programs running simultaneously.

Key highlights

The commercialisation of the Moderna COVID-19 vaccine has turned around the company on its heels. The firm's revenue has **grown thirteen times** from USD 60million in 2019 to **USD 800million**



The company's vision is to become the **world's first digital biotech**. Its mRNA drug development platform has its basis on the foundations of agile software structures and end-to-end digitisation.

The company's AI-based systems enable scientists to conduct multiple research programs at scale. It is running **more than 20 development programs at one go and the commercialised COVID-19 mRNA vaccine in record time.**



Introduction

Moderna is a global biotech company based in Massachusetts, US. The firm is experimenting with the novel mRNA science to create a modern medicine platform. Its vision is to use mRNA as a drug and solve for potential moonshots like cancer.

Strategy

The firm's stakeholder strategy influences its business and digital strategy. Identifying who their work impacts enables Moderna to create an end-to-end value chain aligned with its positive outcomes. Digital at Moderna is part of its vision to become the world's first digital biotech. Five key areas define the firm's strategic framework:

1. **Quality:** Reduce human error through automation
2. **Speed:** Deliver large quantities of mRNA across the ecosystem
3. **Decisions:** Gather, analyse and share data in real-time to inform decision-makers
4. **Scale:** Accommodate the increasing number of R&D programs across modalities
5. **Cost:** Create a leverageable infrastructure across systems

New growth and performance

The new digital system has led to the creation of new software and apps to support the entire research and commercialisation value chain. Scientists at the onset use Drug Design Studio. This in-house mRNA design platform uses a library of existing mRNA sequence components and gives the company the flexibility to import the ones it wants. The pre-clinical production app coordinates every step of the production process and is entirely automated. Its AI-led Sanger sequencing systems have run over 3 million data files.

COVID-19 enabled Moderna to showcase to the world the power of its digital system. Its top line has

Transformation

Moderna is a slight deviation from our DX methodology but still finds space on our list for good reasons. The firm is an exception from the biotech industry as it evolved its digital systems from the ground up and applied the software mindset to its business. Moderna has created and applied algorithms, data systems, cloud and robotics-enabled automation from pre-clinical research to its manufacturing capabilities at the Moderna Technology Center.

The fundamental building blocks of the transformation:

1. **Cloud enablement:** Scientists use complex data sets and cloud tech to support computational power, agility and cost-efficiency.
2. **Integrated:** Create real-time syncs across multiple systems of operations.
3. **Smart devices and AI:** Smart devices provide scientists with real-time data and help them make informed decisions ranging from research, manufacturing to retail and development(R&D). AI applies in the running of complex programs and the provision of accurate sequencing data and insights.

grown by thirteen times Y-o-Y post the commercialisation of mRNA-1273, its COVID vaccine.

Moderna ended fiscal 2020 with a top line of USD803.4million. These numbers indicated significant thirteen-fold growth in the top line Y-o-Y 2020. Its deferred revenues (advances from customers) have gone up from USD63million to USD3.8billion within the same period. COVID-19 has allowed Moderna to quickly seize the opportunity that comes from its superior digital strategy. The firm looks poised to scale to the next level.

Moderna DX Framework

Pillar | Define

Key question | Who we are?

Attributes	Score	Moderna
Clearly articulate purpose	100%	The company's mission is to create and deliver on the promise of messenger RNA, or mRNA science, to create a new generation of innovative medicines for patients.
Sharp focus on outcomes and impact	100%	<p>Value agenda at Moderna is an outcome of a single-minded focus on solving one problem: Can mRNA be a drug?</p> <p>The answer to this question lies in the foundations of the firm's corporate, digital, and product strategy.</p> <p>The company's overall strategic vision, based upon digital, aims at solving this question.</p> <p>Key outcomes:</p> <ol style="list-style-type: none"> 1. Moderna is one of the first companies to hit the market with its COVID-19 vaccine. The said vaccine was also the first commercial success for the firm. 2. It has 24 drug development programs, of which 13 have entered the clinical development stage. 3. mRNA is a complex multicomponent system. The company is integrating the system through end-to-end process digitisation. 4. The end-to-end digital platform has enabled Moderna to develop and launch more than one billion COVID vaccines in 2021.
Culture is the key	100%	<p>Integrity, quality and respect are the foundations of corporate citizenship at Moderna.</p> <p>How Moderna has built its work culture framework:</p> <ol style="list-style-type: none"> 1. Identify the key stakeholders: Identifying the key stakeholders and understanding their goals helped Moderna establish its corporate responsibilities. 2. The firm has built the following corporate citizenship framework by focusing on five pillars: <ul style="list-style-type: none"> - Environment - Community - Employees - Medicines for patients - Ethics <p>Key initiatives:</p> <ol style="list-style-type: none"> 1. Medicines: 21 drug development candidates with 10 in the clinical stage. 2. Focus on attracting and retaining top talent. Offers benefits like education, health, inclusiveness, competitive benefits and structured growth. 3. Saving the environment with near-zero paper use. End-to-end digital operations enable Moderna to operate in a paperless state.

Moderna DX Framework

Pillar | **Simplify**

Key question | **How we operate?**

Attributes	Score	Moderna
Flat organisational design	75%	<p>Moderna is a flat organisation. It has one of the best employment practices and is consistently ranked the best biotech to work by the Science magazine, now for six years in a row.</p> <p>Key initiative:</p> <ol style="list-style-type: none"> 1. Employee resource groups - Represent blacks and women. 2. Voice of the employee: An employee-led, cross-functional group that regularly provides feedback on important company matters.
Treat talent scarcer than capital	75%	<p>Moderna believes that it could only find success in its goals by attracting and retaining the right minds. Hence, it pays tremendous attention to its employees' well-being.</p> <p>The firm focuses on employee health, well-being, financial rewards, learning, growth and all aspects that an individual wants to explore.</p> <p>Key initiatives:</p> <ol style="list-style-type: none"> 1. Created Moderna University 2. Digital Wellness Portal access 3. Resource groups 4. Voice of the Employee initiative 5. Structured HR policy 6. Industry leading rewards
Fast decision-making	100%	<p>Moderna is building end-to-end digital biotech. All information systems from marketing, ops, sales, finance, product, HR, and learning are interconnected.</p> <p>This connectedness drives fast decision-making at Moderna.</p> <p>Key initiative:</p> <ol style="list-style-type: none"> 1. Digital teams work closely with business counterparts. This handholding by the said team enables business leaders to define a digital way of operating. 2. Use of multiple employee-facing apps from digital mRNA design, digital marketing, digital sales etc., enables the organisation to have a universal view of every transaction and activity.

Moderna DX Framework

Pillar | **Innovate**

Key question | **How we grow?**

Attributes	Score	Moderna
Explore ecosystems	100%	<p>Moderna has a diverse base of strategic collaborators focused on the vision of accelerating mRNA research and marketing. The company has forged strategic alliances with pharma & biotech, government entities, foundations, research and academic institutions with therapeutic area expertise.</p> <p>Key partners:</p> <ul style="list-style-type: none"> • DARPA • BARDA • Bill & Melinda Gates Foundation • Vertex • AstraZeneca • Merck <p>New venture labs</p> <p>Moderna has set up a startup accelerator in-house that focuses on blue sky research. New Venture Labs has enabled Moderna to remain a cutting-edge pioneer in mRNA science and has ensured that it maintains the spirit of innovation and inventiveness that has defined the company since its inception and helped propel success to date.</p>
Driven by tech	100%	<p>Tech drives every decision and action at Moderna. From the most sophisticated mRNA experiments to onboarding new hires, managing day-to-day operations to finance and marketing, digital Biotech never sleeps. Every decision is data-driven. Scientists rely on these sophisticated machine learning algorithms to solve moonshots in the global healthcare market.</p> <p>Key initiatives:</p> <ol style="list-style-type: none"> 1. Automated Sanger sequencing: This is an advanced AI implementation for pre-clinical stage quality control of DNA and RNA data. To date, the firm has run over 3-million Sanger data files. 2. Drug design studio: Scientists turn ideas into mRNA designs using a suite of tools called the Drug Design Studio (DDS). DDS contains a sequence design app that allows scientists to build novel mRNA sequences using a library of existing sequence components or through the ones they import. Embedded AI algorithms convert amino acid sequences into nucleotide sequences and optimise a sequence for production. 3. Electronic lab books: Moderna has deployed these notebooks to streamline and track experiments in a standardised and searchable repository. As a result, scientists can better manage data and have the information they can trust, leading to accelerated decision-making.
Accelerate organisation learning	100%	<p>Employee learning and development is an essential focus area. Moderna has launched many initiatives on this front.</p> <p>Key initiatives:</p> <ol style="list-style-type: none"> 1. Moderna University: Corporate university providing all learning solutions to employees 2. Educational assistance plan 3. Academic talks and lectures 4. Education partnership with Harvard Medical School 5. Peer-to-peer learning series 6. Leadership development programs



Insights **that find you**

How we think

Our aim is to produce exponential impact for every business and career through the power of research. We understand the industry to know that the way research is produced, personalized and consumed needs to change. We are the catalysts to bring a fresh and new perspective to you.

How can we help?

reachus@twimbit.com

The twimbit experience:



Subscriptions



Communities



Advisory



The **W**orld Is **M**oved **B**y **I**deas and **T**echnology

Copyright 2021.
All rights reserved.

www.twimbit.com