

Perspectives on Innovative Data Science Leadership in the Life Sciences Industry

Stanley Y. Shaw, MD PhD
Associate Dean for Executive Education
Harvard Medical School

Division of Cardiovascular Medicine
Brigham & Women's Hospital

July 6, 2022



HARVARD
MEDICAL SCHOOL

Executive Education



Executive Education

Developing leaders who are experts in the business of health care, in the context of the art, science & practice of medicine

Leadership insights in the specific context of health care



Executive Education

Google

athenahealth



AMGEN



Johnson & Johnson



Agenda

- A COVID era vignette
- Architecting an organization for digital transformation
- Encouraging a bilingual culture
- Creating value through data in the tech world
- COVID era epilogue
- Conclusion: Data science leadership as part of organizational strategy

What are the biggest challenges you face as a leader?

- A. Data access, organization, curation
- B. Culture
- C. General familiarity with data science approaches
- D. Support of C-suite
- E. Digital transformation
- F. Other





FINANCIAL TIMES

EU medicines regulator approves Pfizer/BioNTech Covid vaccine

First vaccinations expected to start across 27-member bloc within days

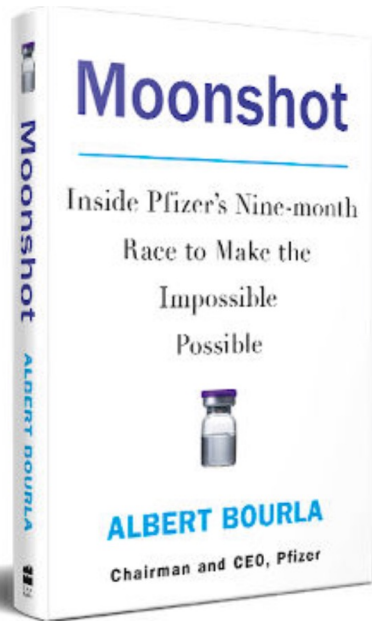
Michael Peel in Brussels, **Donato Paolo Mancini** in Rome, **Hannah Kuchler** in New York and **Joe Miller** in Frankfurt DECEMBER 21 2020



HARVARD
MEDICAL SCHOOL

Executive Education

A challenging transformation (Pfizer 2019)



“The [transformation] had created a lot of anxiety and tension... Leaders were still figuring out where they stood in the re-org...”

I was sensing in early March 2020 that our effort to reimagine Pfizer’s organizational structure was causing emotions to boil over.”

- *Albert Bourla, CEO*



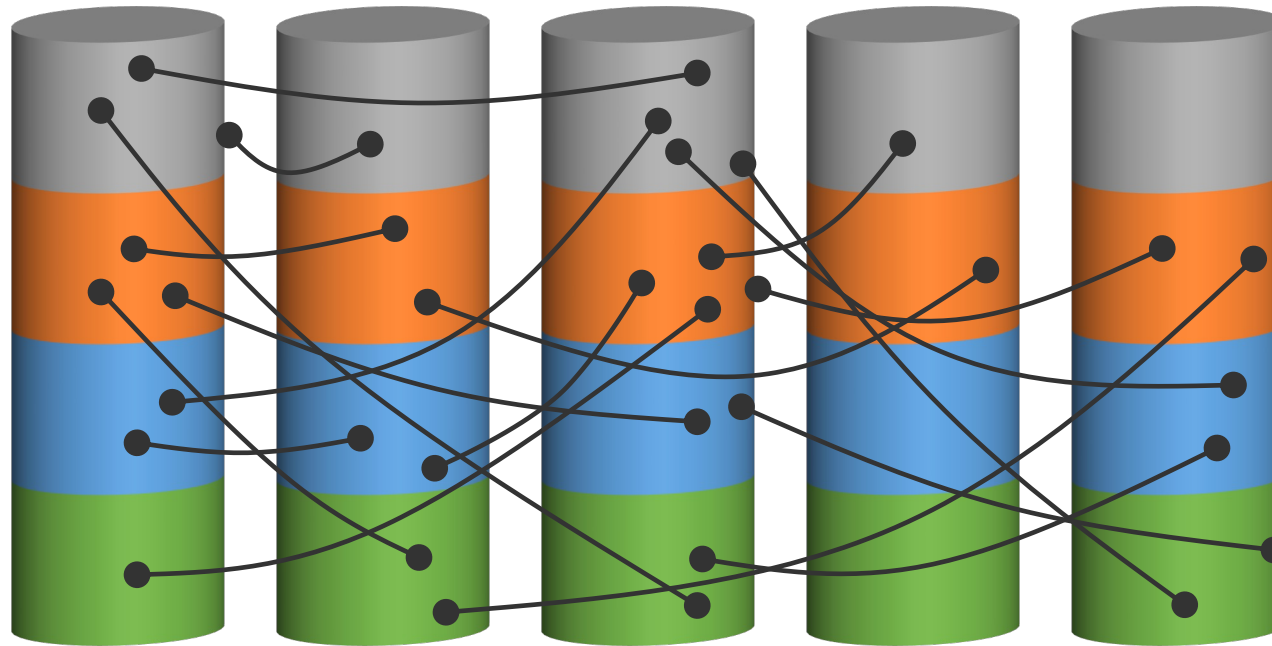
HARVARD
MEDICAL SCHOOL

Executive Education

Pfizer's progress in digitization paid off

- **REAL-TIME PREDICTIVE MODELS** of COVID county-level attack rates helped the clinical development team choose clinical trial sites
- **REMOTE VISITS** replaced 75% of clinical trial site monitoring visits for the vaccine study
- **DIGITAL OPERATIONS CENTER & IoT SENSORS** provided an end-to-end view of manufacturing, supply chain & cold chain integrity



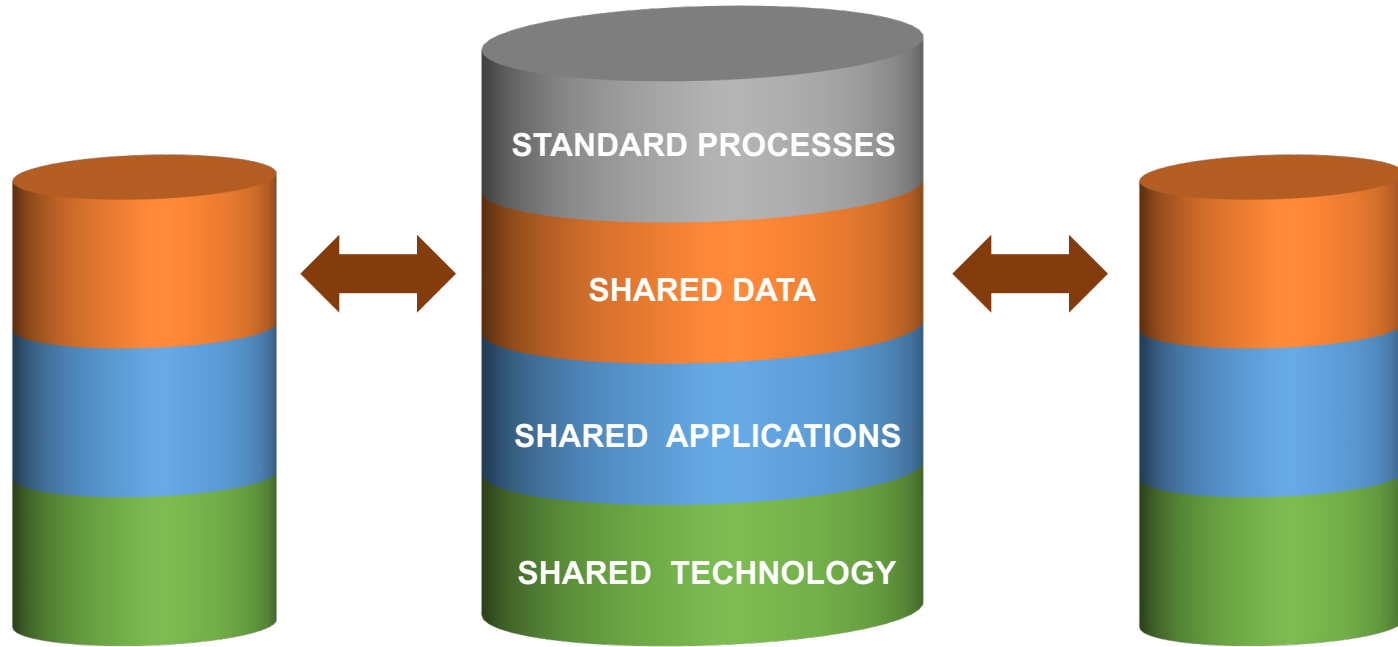


PROCESSES

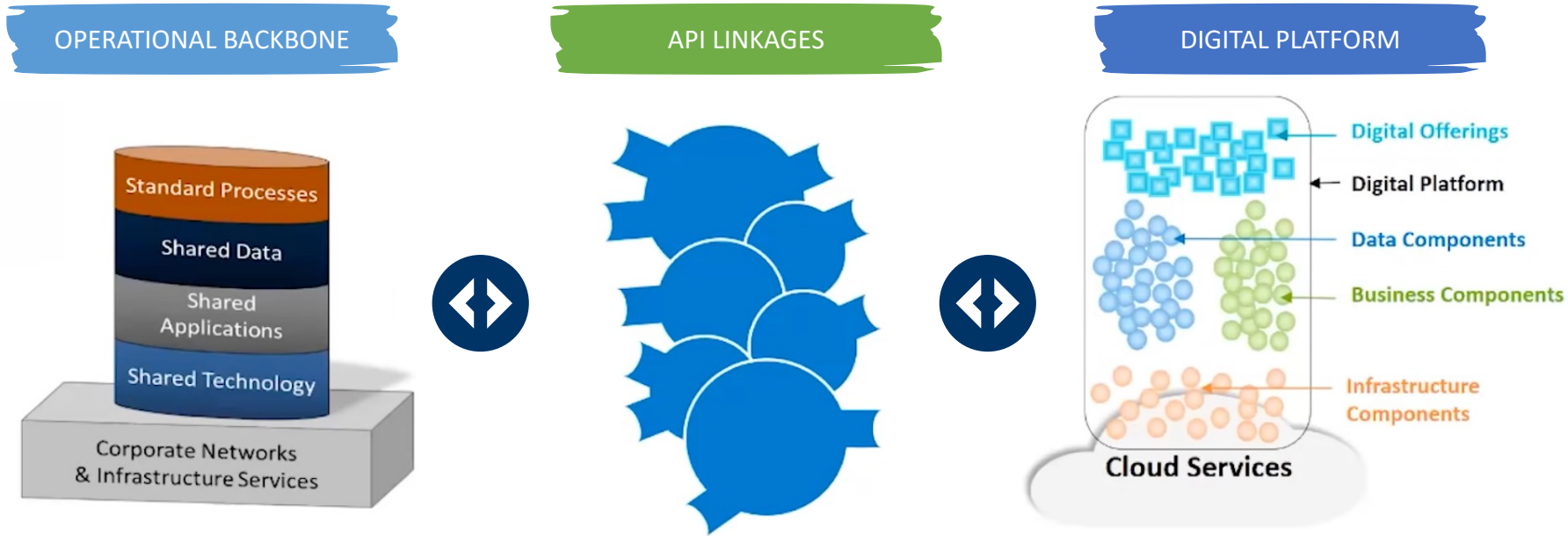
DATA

APPLICATION

TECHNOLOGY



New digital offerings engage customers in a personalized experience



Ross, Beath, Mocker. Designed for Digital



HARVARD
MEDICAL SCHOOL

Executive Education

Moving beyond digitization to digital

- From *enabling* strategy to *inspiring* it

Enhancing business processes

Social
Mobile
Analytics
Cloud
IoT

New business models

**New customer value propositions
that meet evolving expectations**



HARVARD
MEDICAL SCHOOL

Executive Education

One CEO's view (only one year into a digital/data transformation)

“As we’ve gotten quite scaled and working on digital health and data science, we’ve learned there’s a lot of talk and very little in terms of actual delivery of impact...

The Holy Grail of having unstructured machine learning go into big clinical data lakes and then suddenly finding new insights – we’ve not been able to crack... We are spending a lot of our energy just trying to get all of our data harmonized, so that some algorithm could maybe find anything of use.”



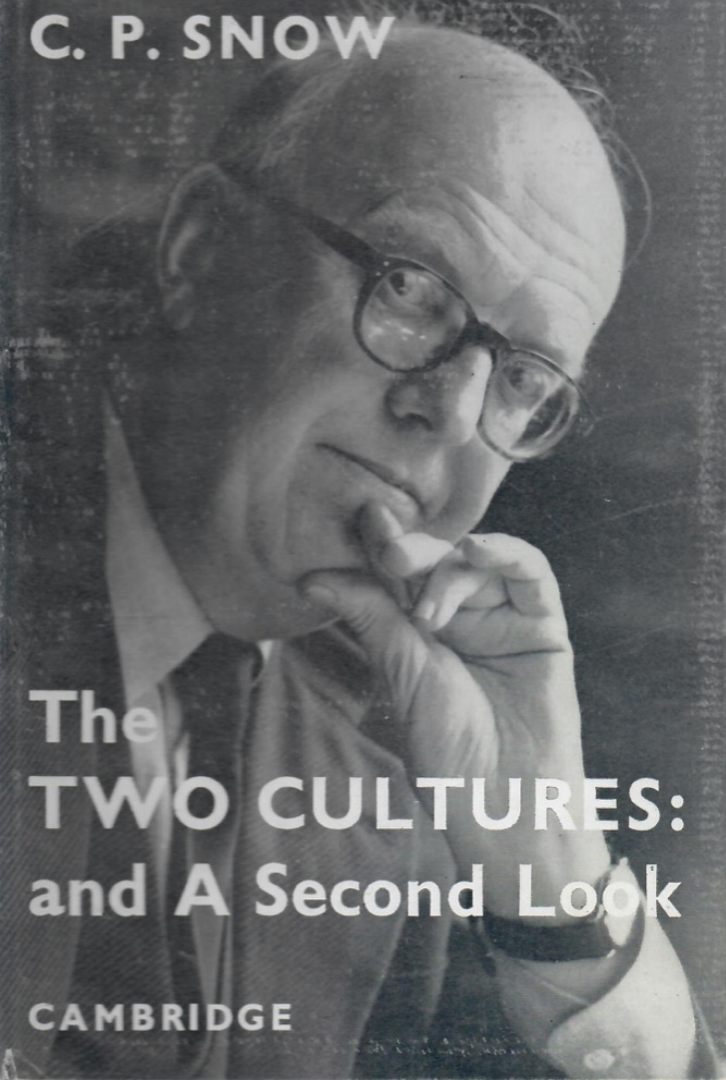
“Change is hardest in the middle”

- Rosabeth Moss Kanter, Harvard Business School



HARVARD
MEDICAL SCHOOL

Executive Education



“Literary intellectuals at one pole—at the other scientists, and as the most representative, the physical scientists...”

There seems then to be no place where the cultures meet... But at the heart of thought and creation we are letting some of our best chances go by default. **The clashing point of two subjects, two disciplines, two cultures—of two galaxies, so far as that goes— ought to produce creative chances. In the history of mental activity that has been where some of the break-throughs came.”**



HARVARD
MEDICAL SCHOOL

Executive Education

‘Technical debt is nothing compared to cultural debt’

Data science as an integrated part of R&D culture ... not a service organization.

Bilingual culture: *What problems can be solved? What experiments to do & what data sets to create with an eye to downstream data science?*



- Daphne Koller, Founder & CEO, insitro



HARVARD
MEDICAL SCHOOL

Executive Education

Leading at an interface (vs. training)

**Harvard
Business
Review**

Cross-Functional Management

Cross-Silo Leadership

by Amy C. Edmondson, Sujin Jang, and Tiziana Casciaro

From the Magazine (May-June 2019)

1. **Develop and deploy “Cultural Brokers”** who span domains (Bridges vs. Adhesives)
2. **Encourage inquiry (& model curiosity)** about thinking & practices
3. **Actively consider other field’s viewpoints**, speak multiple “languages”
4. **Encourage employees to explore distant networks** to complement cross-functional teams
5. Hire for **growth mindset, curiosity, empathy**



HARVARD
MEDICAL SCHOOL

Executive Education

“To unleash the potential of horizontal collaboration, leaders must equip people to learn and to relate to one another across cultural and logistical divides.”

- Amy Edmondson, Harvard Business School

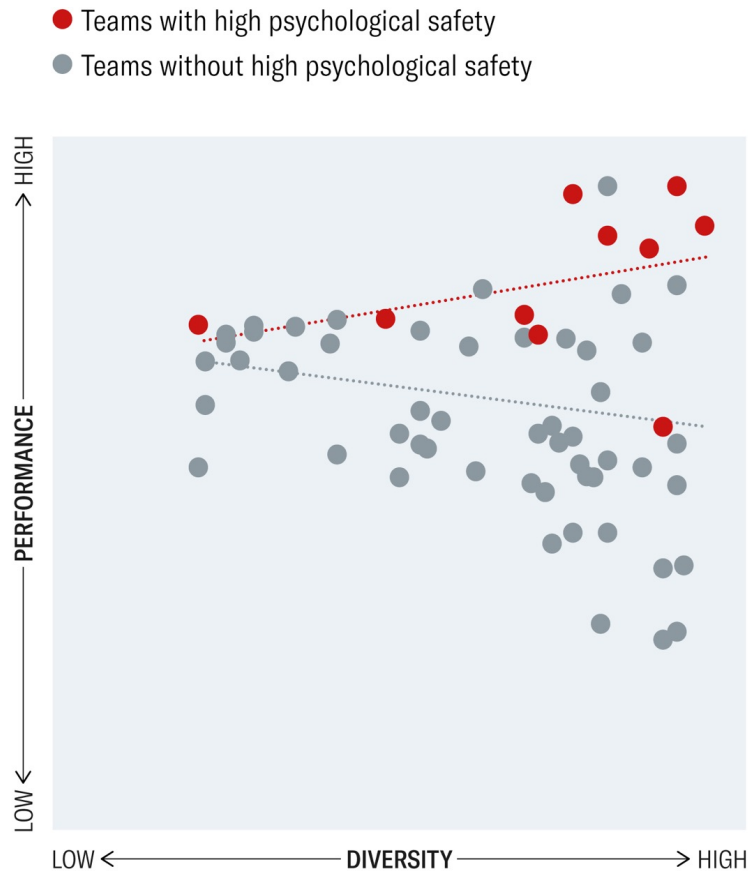


HARVARD
MEDICAL SCHOOL

Executive Education

Psychological safety unlocks performance in diverse teams

Bresman & Edmondson 2022 HBR



Cross-discipline collaboration at Bell Labs



*By intention, everyone would be in one another's way. .. [T]he long corridor for the wing that would house many of the physics researchers was intentionally made to be **seven hundred feet in length...** Traveling its length without encountering a number of acquaintances, problems, diversions, and ideas would be **almost impossible...** Walking down that impossibly long tiled corridor, **a physicist on his way to lunch in the Murray Hill cafeteria was like a magnet rolling past iron filings...***



HARVARD
MEDICAL SCHOOL

Executive Education

Customer obsession creates value

“Leaders start with the customer and work backwards. They work vigorously to earn and keep customer trust. Although leaders pay attention to competitors, they obsess over customers.”



Amazon leadership principle



HARVARD
MEDICAL SCHOOL

Executive Education

Books were simply the “first best product”

“You can only **do things online today that simply can’t be done any other way**... There’s no other way to have a two-and-a-half-million-title bookstore.”

- Jeff Bezos, Amazon founder

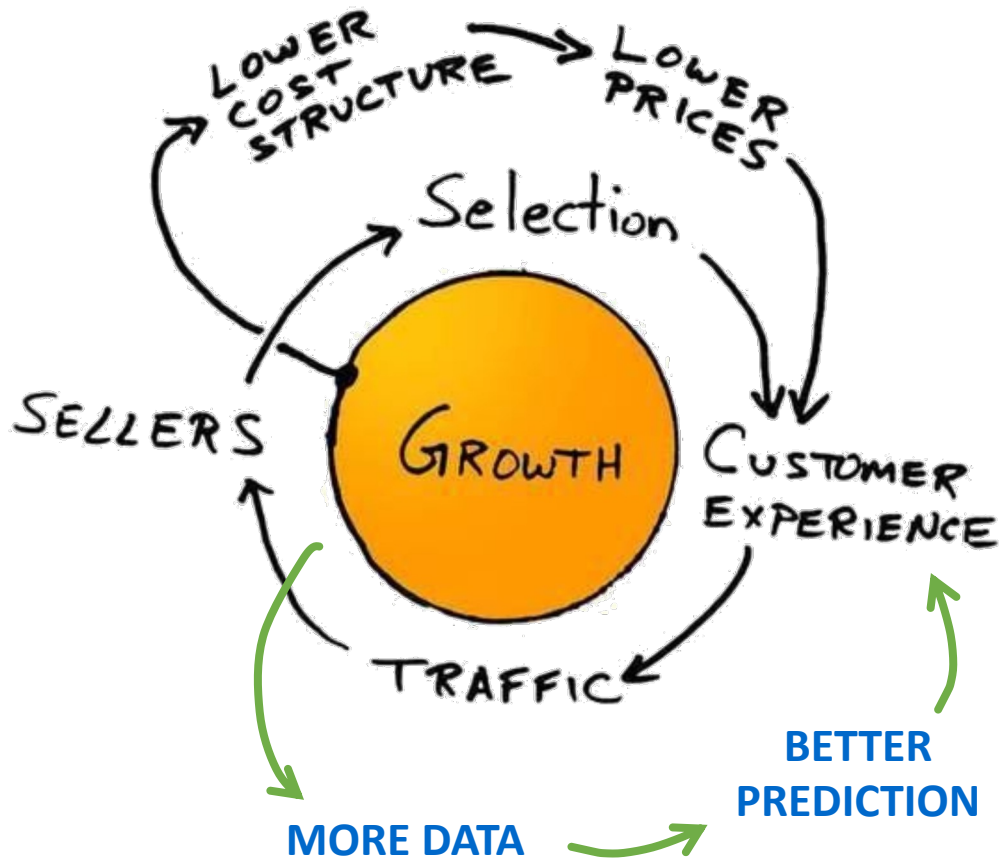


HARVARD
MEDICAL SCHOOL

Executive Education

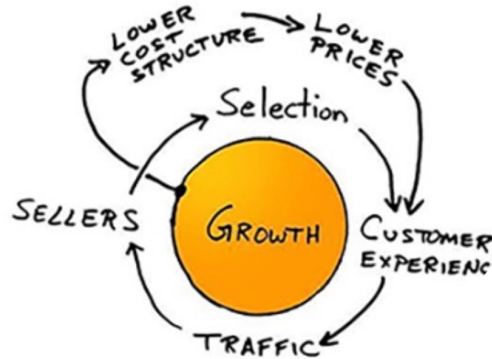
Amazon's virtuous cycle (2001)

This **digital mindset** is the difference between selling books on the internet & **being a digital company**



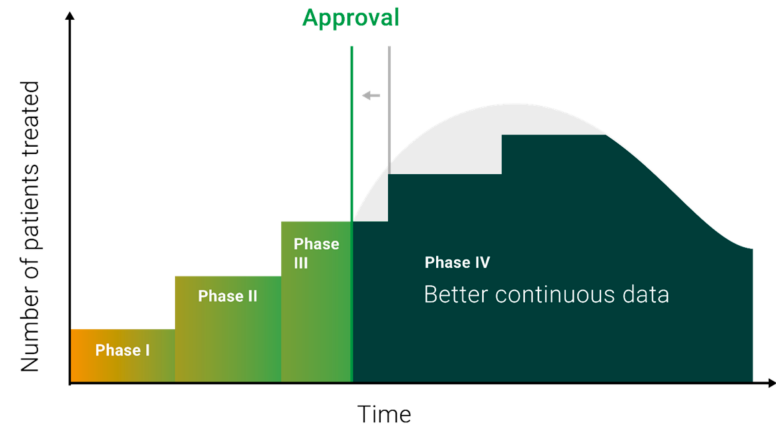
COVID highlighted RWE and new evidence paradigms

What is your virtuous cycle?



Amy Abernethy, Verily

Longitudinal, personalized data
New data collection & engagement platforms
Integrated data collection for value & HEOR

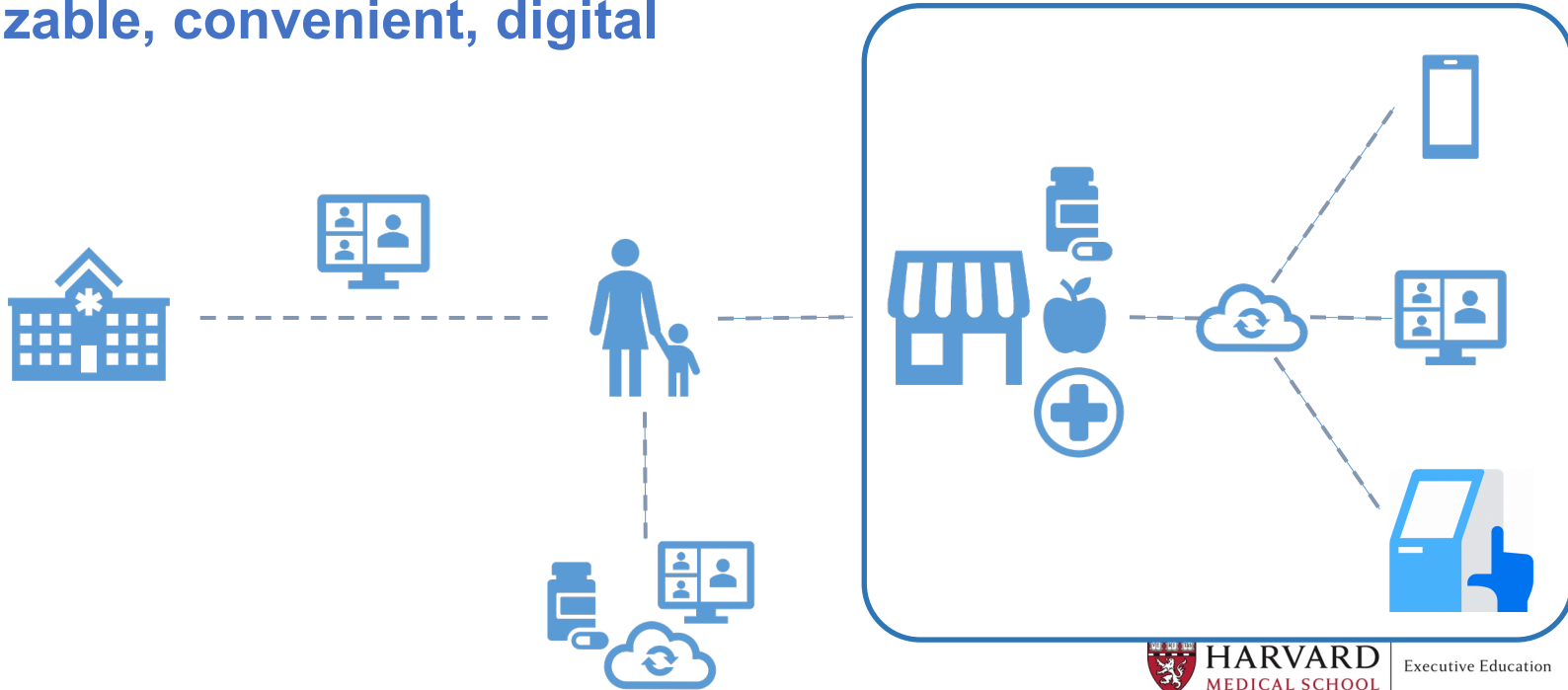


HARVARD
MEDICAL SCHOOL

Executive Education

COVID accelerated digital expectations of customers

Customizable, convenient, digital



HARVARD
MEDICAL SCHOOL

Executive Education

“The [BLA] approval was thanks to all the changes we made to strengthen Pfizer’s culture in the years leading up to the vaccine...

It was not only the focus we placed on innovation or the investments we made in increased resources for digital technologies and research...

The most impactful change was the cultivation of a purpose-driven culture.”

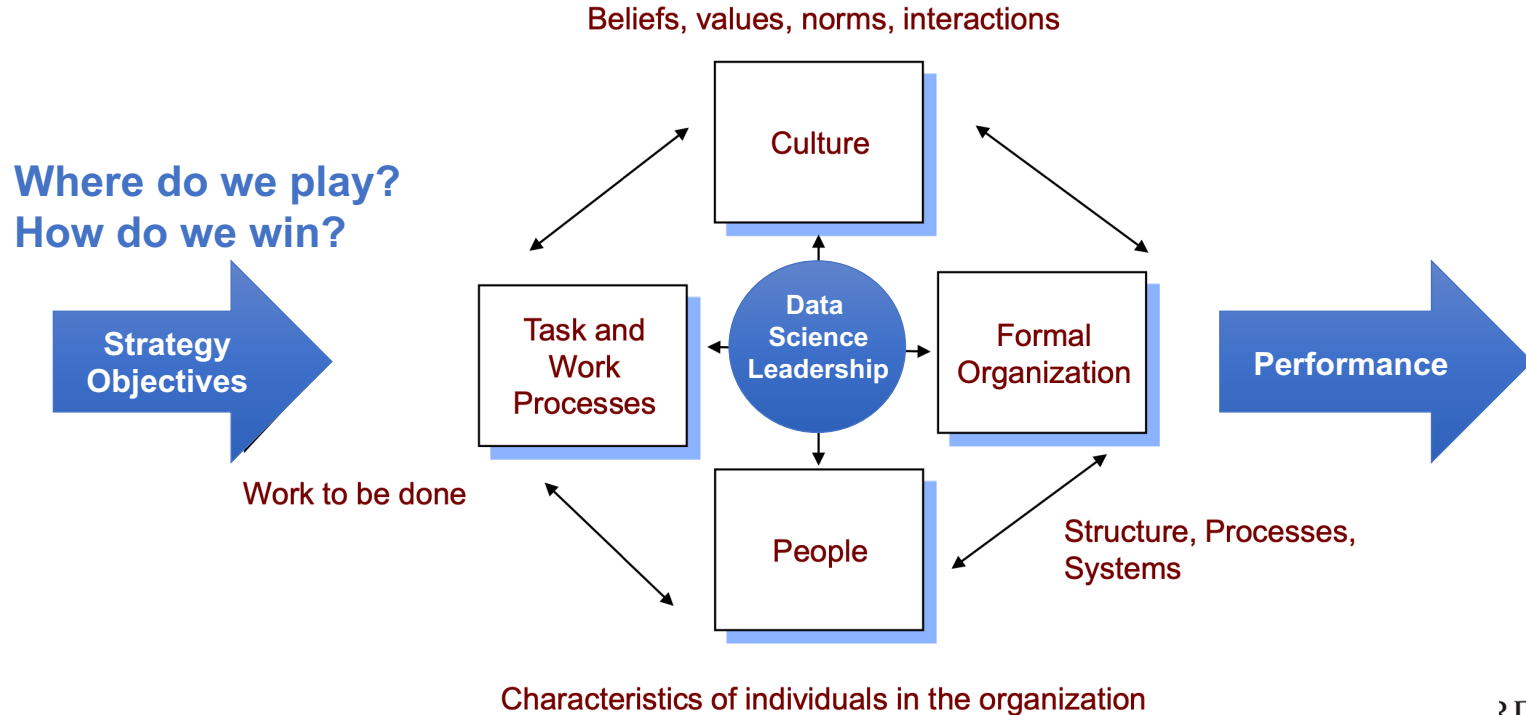
- Albert Bourla, CEO Pfizer



HARVARD
MEDICAL SCHOOL

Executive Education

Data science as part of strategy: organizational leadership



THANK YOU

stanley_shaw@hms.harvard.edu



HARVARD
MEDICAL SCHOOL

Executive Education