

Effective Integration of Data Science Section 4, Cross- cutting issues: Culture Change



culture

1 of 2 noun

cul·ture

'kəl-çər

[Synonyms of culture >](#)

1 a : the customary beliefs, social forms, and material traits of a racial, religious, or social group

also : the characteristic features of everyday existence (such as diversions or a way of life) shared by people in a place or time

| popular *culture*

| Southern *culture*

b : the set of shared attitudes, values, goals, and practices that characterizes an institution or organization

| a corporate *culture* focused on the bottom line

c : the set of values, [conventions](#), or social practices associated with a particular field, activity, or societal characteristic

Source: Merriam-Webster

change 1 of 2 verb

'chānj 

changed; changing

[Synonyms of change >](#)

transitive verb

1 a : to make different in some particular : **ALTER**

| never bothered to *change* the will

b : to make radically different : **TRANSFORM**

| can't *change* human nature

c : to give a different position, course, or direction to

| *changed* his residence from Ohio to California

2 a : to replace with another

| let's *change* the subject

b : to make a shift from one to another : **SWITCH**

| always *changes* sides in an argument

Source: Merriam-Webster

From Wikipedia, the free encyclopedia

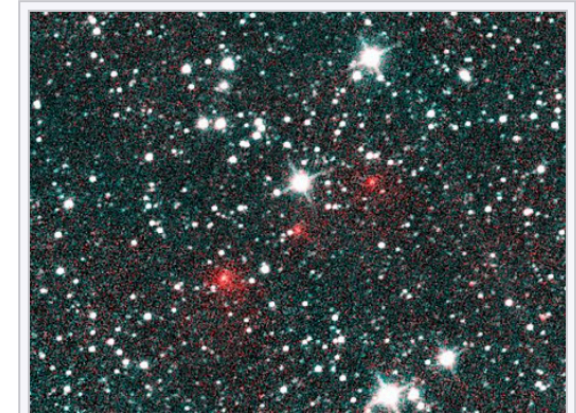
Not to be confused with [information science](#).

Data science is an [interdisciplinary](#) academic field^[1] that uses [statistics](#), [scientific computing](#), [scientific methods](#), processes, [algorithms](#) and systems to extract or extrapolate [knowledge](#) and insights from potentially noisy, structured, or [unstructured data](#).^[2]

Data science also integrates domain knowledge from the underlying application domain (e.g., natural sciences, information technology, and medicine).^[3] Data science is multifaceted and can be described as a science, a research paradigm, a research method, a discipline, a workflow, and a profession.^[4]

Data science is a "concept to unify [statistics](#), [data analysis](#), [informatics](#), and their related [methods](#)" to "understand and analyze actual [phenomena](#)" with [data](#).^[5] It uses techniques and theories drawn from many fields within the context of [mathematics](#), statistics, [computer science](#), [information science](#), and [domain knowledge](#).^[6] However, data science is different from [computer science](#) and information science. [Turing Award](#) winner [Jim Gray](#) imagined data science as a "fourth paradigm" of science ([empirical](#), [theoretical](#), [computational](#), and now data-driven) and asserted that "everything about science is changing because of the impact of [information technology](#)" and the [data deluge](#).^{[7][8]}

A **data scientist** is a professional who [creates programming code](#) and combines it with statistical knowledge to create insights from data.^[9]



The existence of [Comet NEOWISE](#) (here depicted as a series of red dots) was discovered by analyzing [astronomical survey](#) data acquired by a [space telescope](#), the [Wide-field Infrared Survey Explorer](#).

Why Is Company Culture So Important?

Culture attracts world-class talent to your organization. ✓

Culture creates alignment. ✓

Culture focuses engaged employees. ✓

Culture affects performance. ✓

A Connection to Culture Drives Professional and Personal Results

Those who strongly agree with “I feel connected to my organization’s culture” are:

3.7x

as likely
to be engaged at work

5.2x

as likely
to strongly agree they would
recommend their organization
as a great place to work

68%

less likely
to feel burned out at work very
often or always

55%

less likely
to be watching for job
opportunities or actively looking
for another job

[Download image](#)

GALLUP

Managers should recognize the most common reasons for resistance:

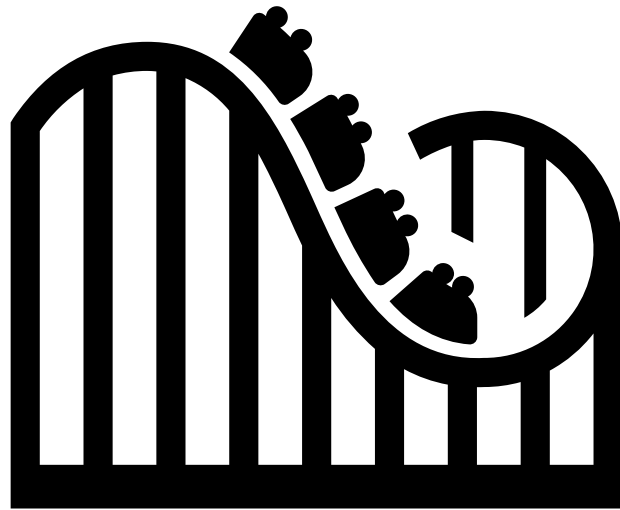
a desire not to lose something of value,

a misunderstanding of the change and its complications,

a belief that the change does not make sense for the organization, and

a low tolerance for change in general.





Kotter and Schlesinger go on to say:

Managers can choose from an array of techniques for overcoming resistance:

- participation and involvement,
- negotiation and agreement,
- facilitation and support,
- education and communication,
- manipulation and co-optation, and
- both explicit and implicit coercion.

An example NSO - Thailand

They were looking to retool so they could:

- Modernise their business processes
- Raise the profile of official statistics within the national data and statistical system
- Communicate data with impact
- Upskill their sizable workforce (~ 5000)
- Innovate and sustain initiatives in data management and data science



Strategy chosen: participation and involvement



- Thai NSO asked UNICEF and OECD to analyse its business processes using an inclusive and neutral 3rd party perspective.
- A comprehensive review was performed over three days in November 2019, interviewing over 100 staff from a wide spectrum of divisions.

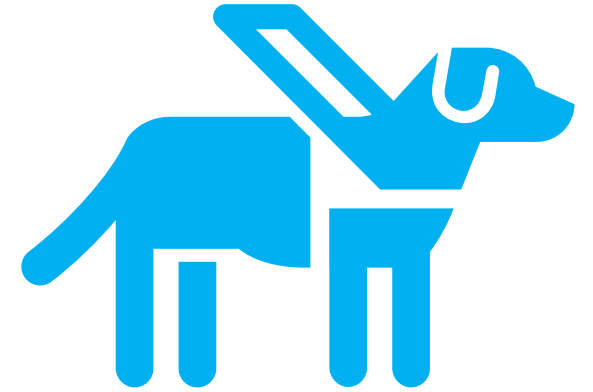
Strategy chosen: **negotiation and agreement**



- The report was shared widely within the NSO, and several broadly attended webinars were hosted, bringing in both senior leadership, and the rank and file.
- Consensus was generated about initial changes that should be made, including support for internal and public-facing data management approaches such as data cataloging and a standards-based data warehouse.

Strategy chosen: **facilitation and support**

- Senior leadership were publicly behind the change, facilitating and supporting the new initiatives by connecting modifications to the organigram to desired change outcomes, and redirecting resources to new initiatives.



Strategy chosen: **education and communication**

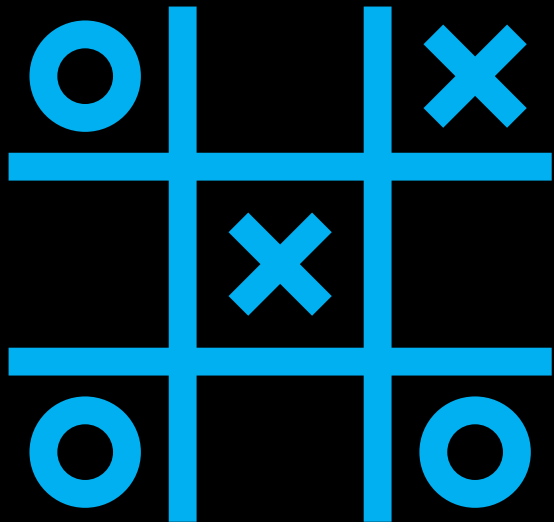


- New online courses were created to upskill staff.
- Changes and the thinking behind them were clearly articulated in regular meetings.

April 2023 – iteration!

- UNICEF and OECD were invited to review the changes and suggest further steps.
- Important changes had been made to data management and communication, and they were ready for more.
- UNICEF and OECD interviewed dozens more staff over several days and then suggested further steps in concert with both management and “the troops”.
- This comprehensive approach to change management, combined with an iterative change process is leading to enduring success.





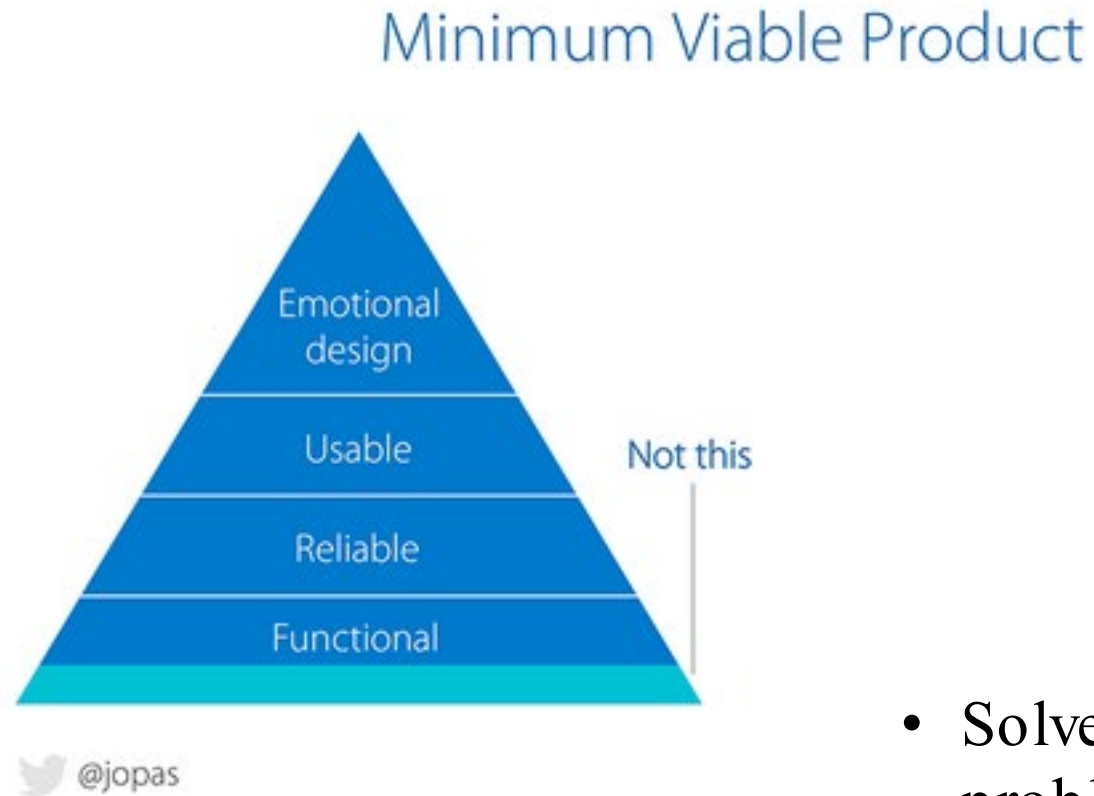
Implementation approaches

- Vertical versus Horizontal
 - Do you put a spike in the system, or
 - Do you pancake it?
- Centralized or distributed
 - Do you build a single center of excellence, or
 - A distributed network?
- Waterfall or PDCA
 - Do you design it A to Z, or
 - Follow what you can see in the fog lights?

A UNICEF example

Frontier Data Network,
an MVP approach:

- Not foundational,
- Vertical.



- Solve part of the problem from A to Z,
- Then keep adding slices.

What does that
look like in
practice?

To make a prairie (1755)

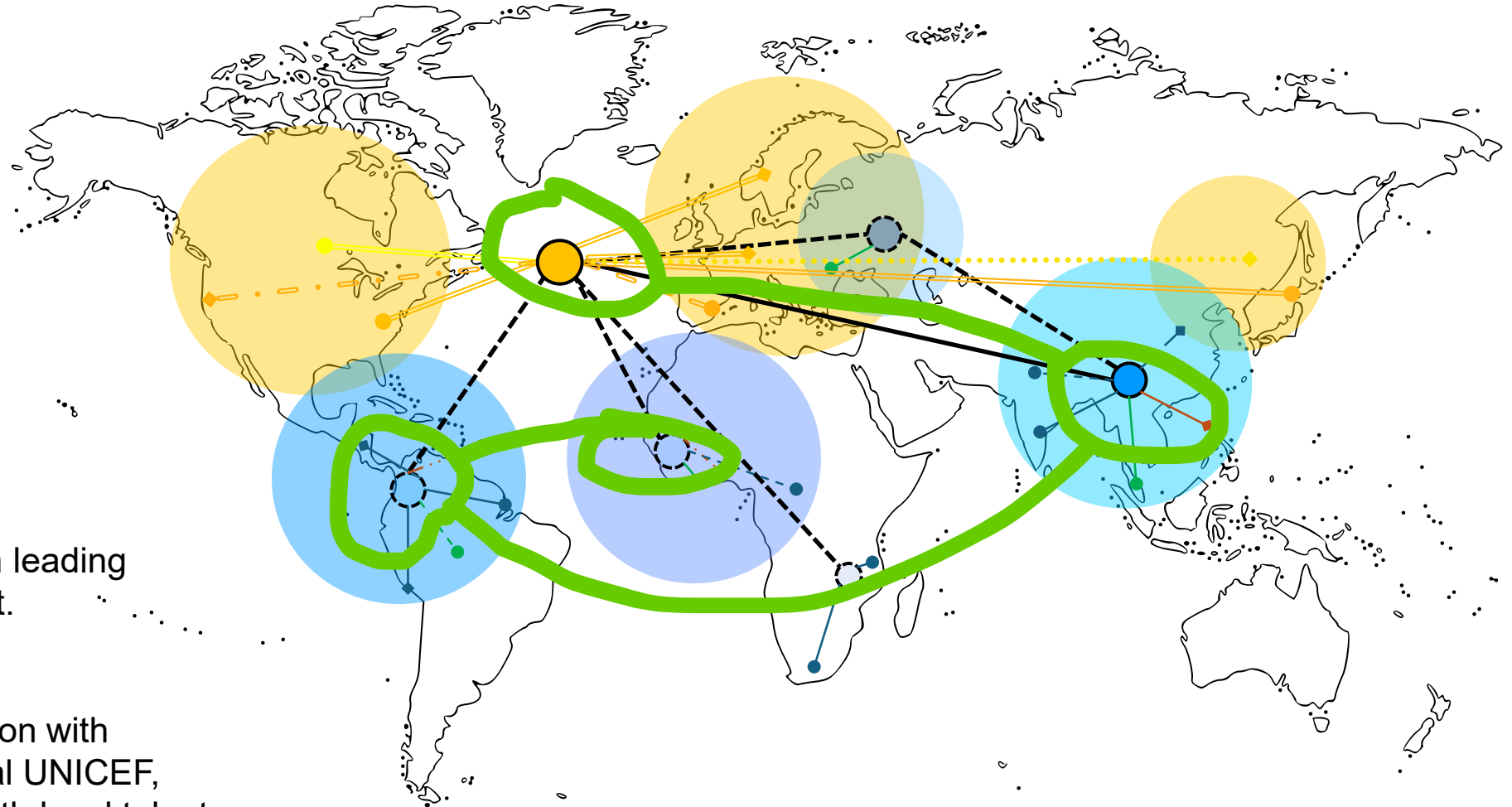
Emily Dickinson 1830 – 1886

To make a prairie it takes a clover and one bee,
One clover, and a bee.
And revery.
The revery alone will do,
If bees are few.


Or prosaically speaking: a network starts with 2 nodes...

FRONTIER DATA NETWORK


A community of practice to promote frontier data innovation and capacity building



Frontier Data Connect

 to engage and work with leading experts and global talent.

Frontier Data Nodes

 to strengthen collaboration with Governments and Global UNICEF, pairing local solutions with local talent.

Why did we select those approaches?

- Vertical
 - we needed to prove value quickly and we had few resources.
- Network
 - we needed resilience as UNICEF is subject to frequent changes of staff, structure, and plan.
 - We are global and decentralized, so we designed for reproducibility, sustainability, and scalability.
- Iterative
 - We only had enough petrol to get a little ways down the road...
 - We didn't know exactly what our stakeholders needed.



Summary

- As the Peter Drucker chestnut reminds us, “Culture eats strategy for breakfast.”
- Change is scary.
- Managers should recognize the most common reasons for resistance and employ a range of strategies.
- There is no one solution. We live in a world of competing goods and leaders need to balance resources. We have to sell data science!
- It’s new, we don’t know exactly what our users need, we have to keep them close, center on their use cases, prove value quickly.





Thank you...