



e-Science in Unilever: The Challenges Ahead

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Unilever R&D Port Sunlight



Contents



- **Introduction to Unilever, & our data challenges**
- **Drivers for change**
- **Transformation of R&D through information and data**
- **The cultural challenges**

It all starts with the consumer ...



2bn
consumers
worldwide use a
Unilever product
on any day

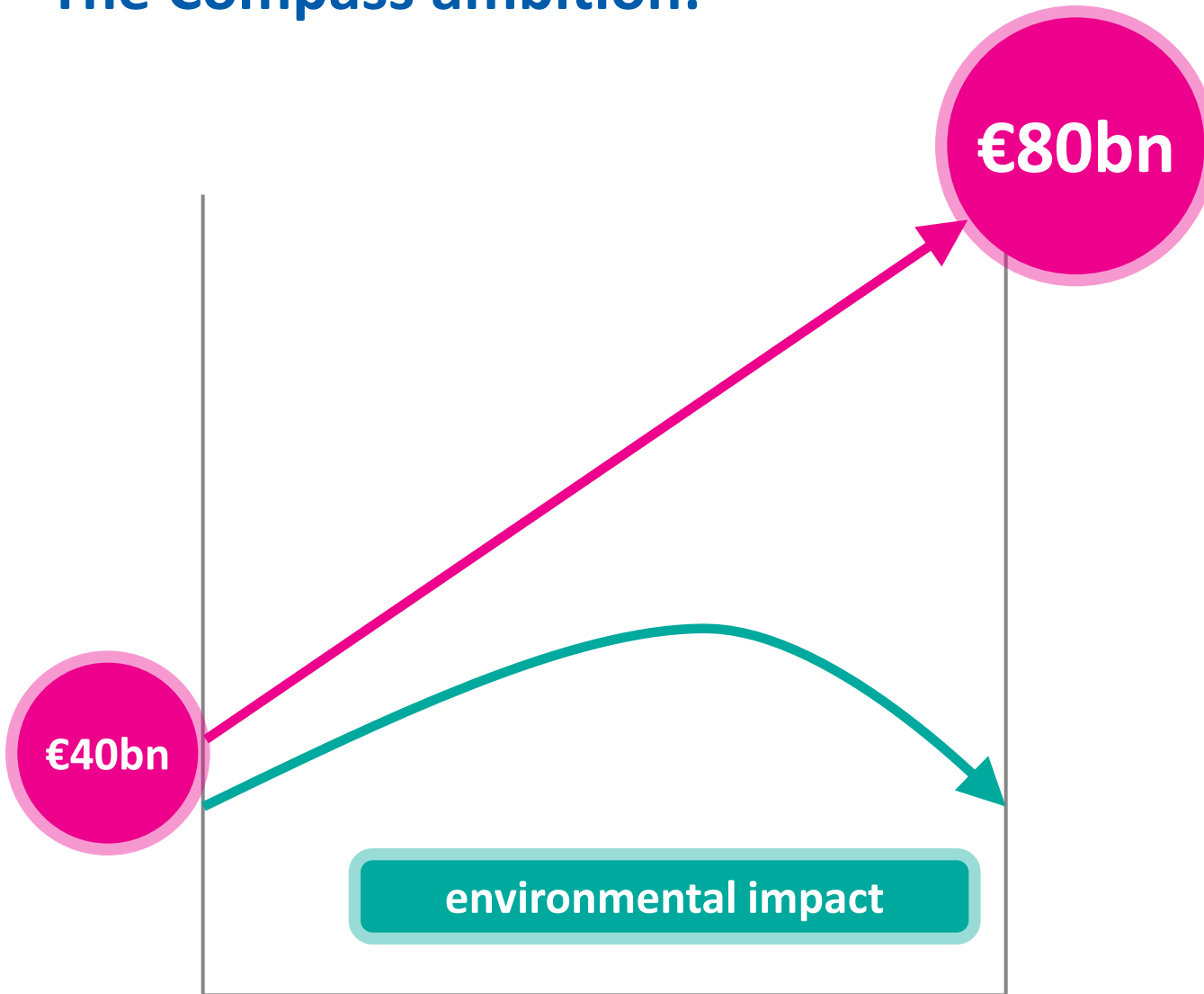
53%
of sales in
emerging markets

Products sold in
more than
180
countries

More than
50 years
experience in
Brazil, China, India
and Indonesia



The Compass ambition:



The Unilever Sustainable Living Plan



IMPROVING HEALTH AND WELL-BEING

By 2020 we will help more than a billion people take action to improve their health and well-being.



REDUCING ENVIRONMENTAL IMPACT

By 2020 our goal is to halve the environmental footprint of the making and use of our products as we grow our business.*



ENHANCING LIVELIHOODS

By 2020 we will enhance the livelihoods of hundreds of thousands of people as we grow our business.

HEALTH & HYGIENE



IMPROVING NUTRITION



GREENHOUSE GASES



WATER



WASTE



SUSTAINABLE SOURCING



BETTER LIVELIHOODS



<http://unilever.com/sustainable-living/index.aspx>



THREE BIG TARGETS

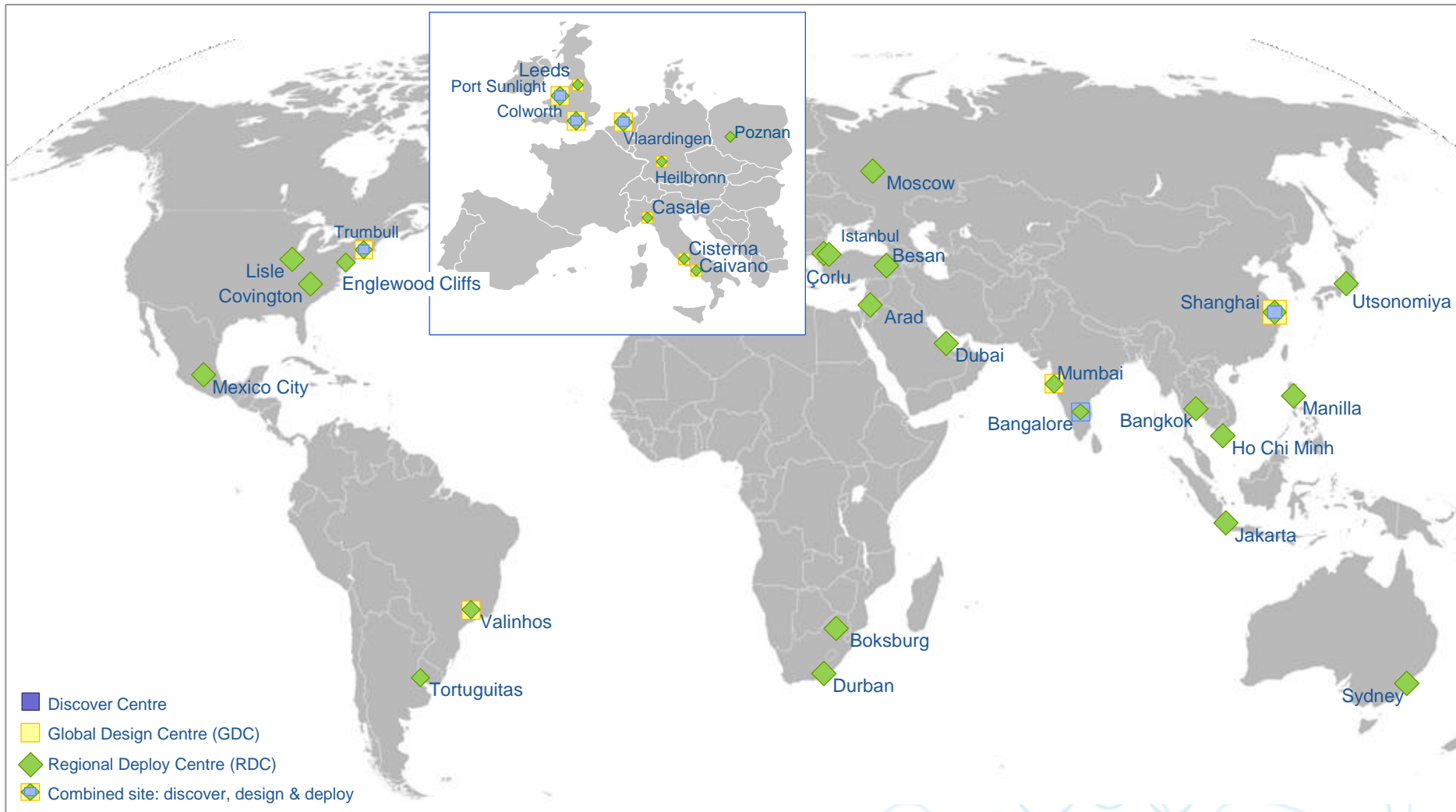


HELP
1 BILLION
PEOPLE IMPROVE
THEIR HEALTH
& WELLBEING

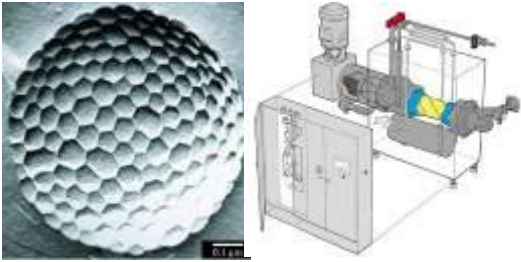
HALVE
ENVIRONMENTAL
FOOTPRINT OF
OUR PRODUCTS

SOURCE
100%
OF AGRICULTURAL
RAW MATERIALS
SUSTAINABLY

Unilever R&D centers: an integration challenge



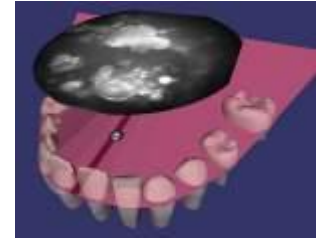
Unilever Science Platforms



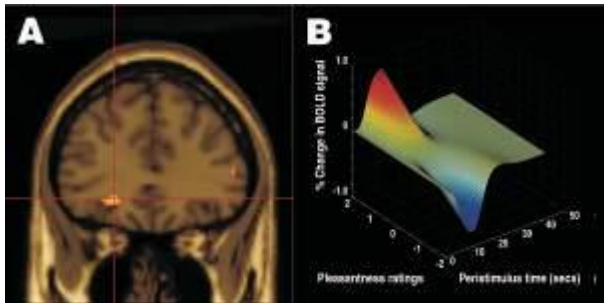
**Structured Materials
and Process Science**



Bioscience



**Advanced Measurement
and Data Modelling**



Sensation, Perception and Behaviour



Nutrition and Health

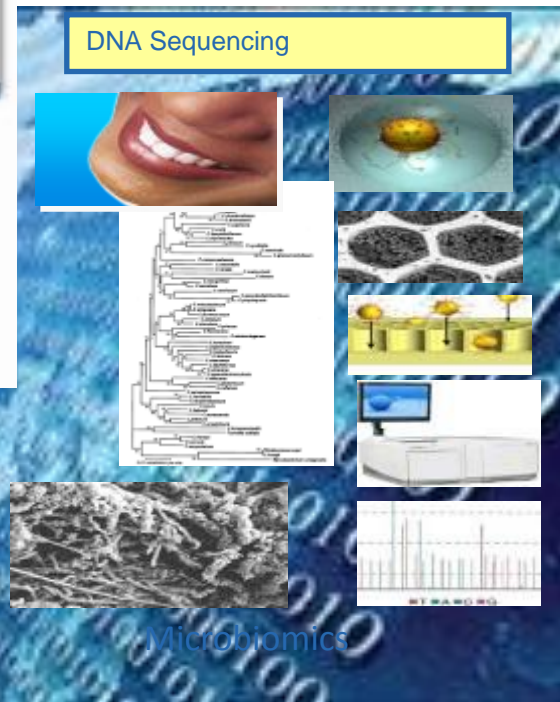
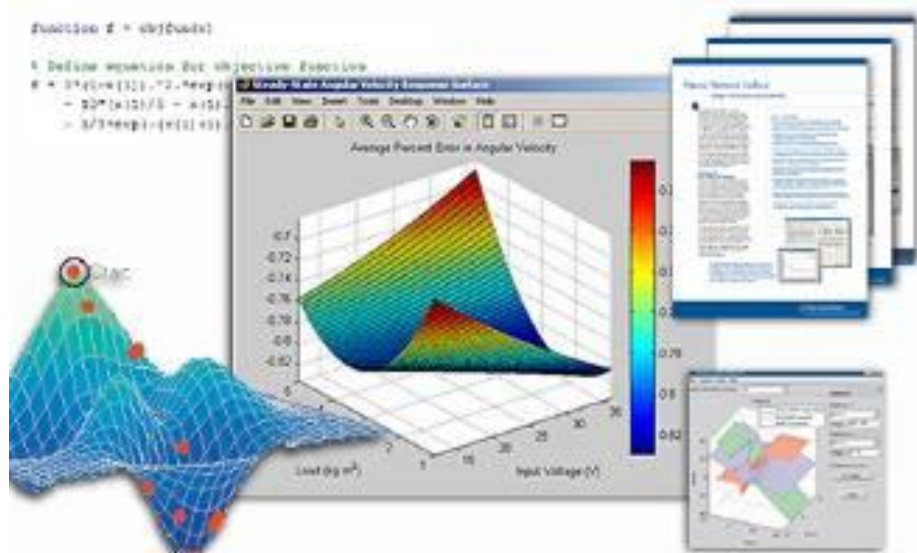
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The Economist



Scientific revolutions are happening every day ..



...new tools for data mining and analysis are becoming available to everybody, online, in real time, as rental services....



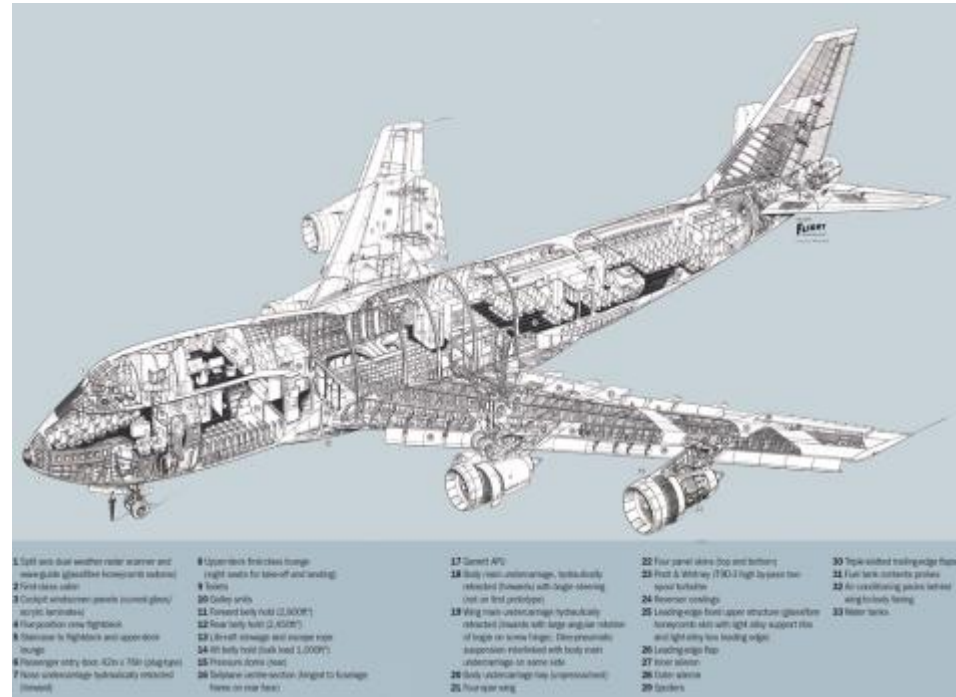
“Today, to out compute is to out compete”

The 'FMCG product'



One portfolio: >700 thousand specs across all Categories with 25% of these changing per annum

The 'Traditional Product'



One product: 4.5 million parts, 75 thousand drawings



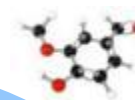
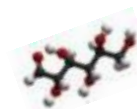
**Design new
experiment**

**Patentability,
cost &
availability**

**Test
efficacy**

**Computing
analysis**

**Criteria
match**

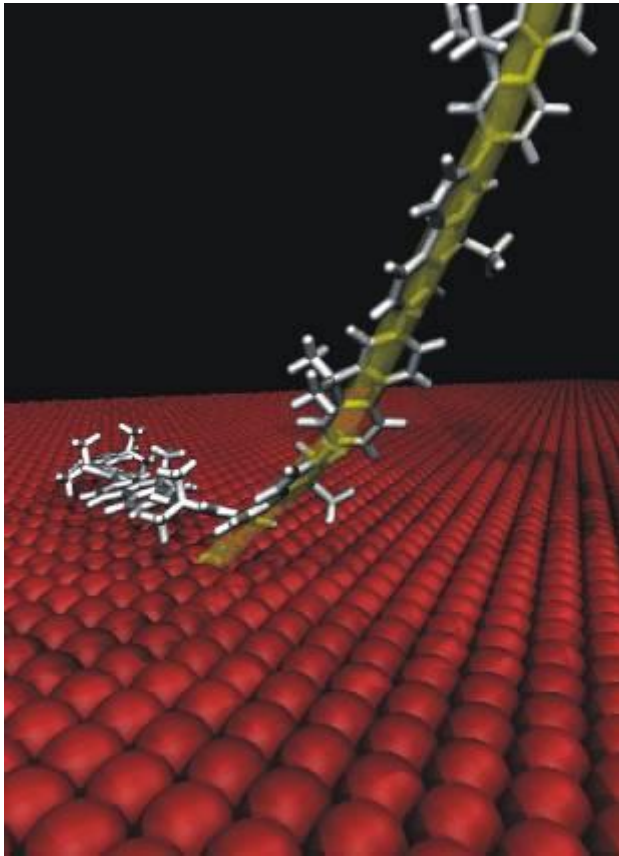


Modelling approaches

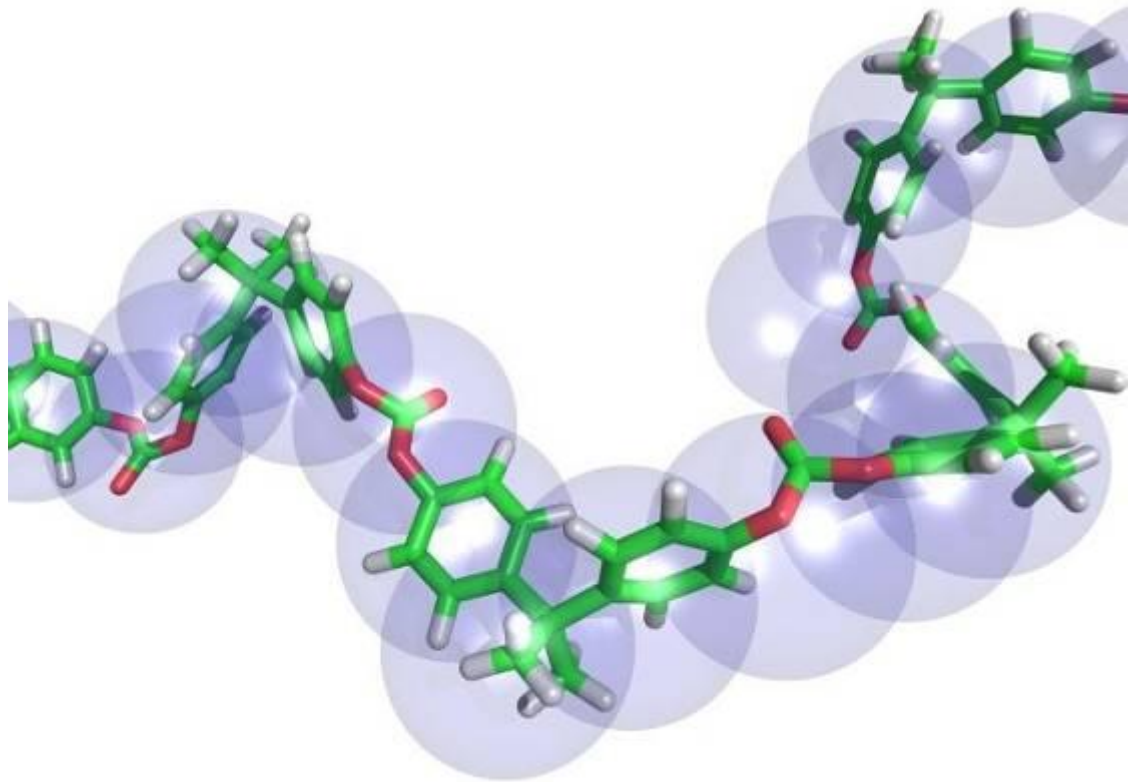
Atomistic



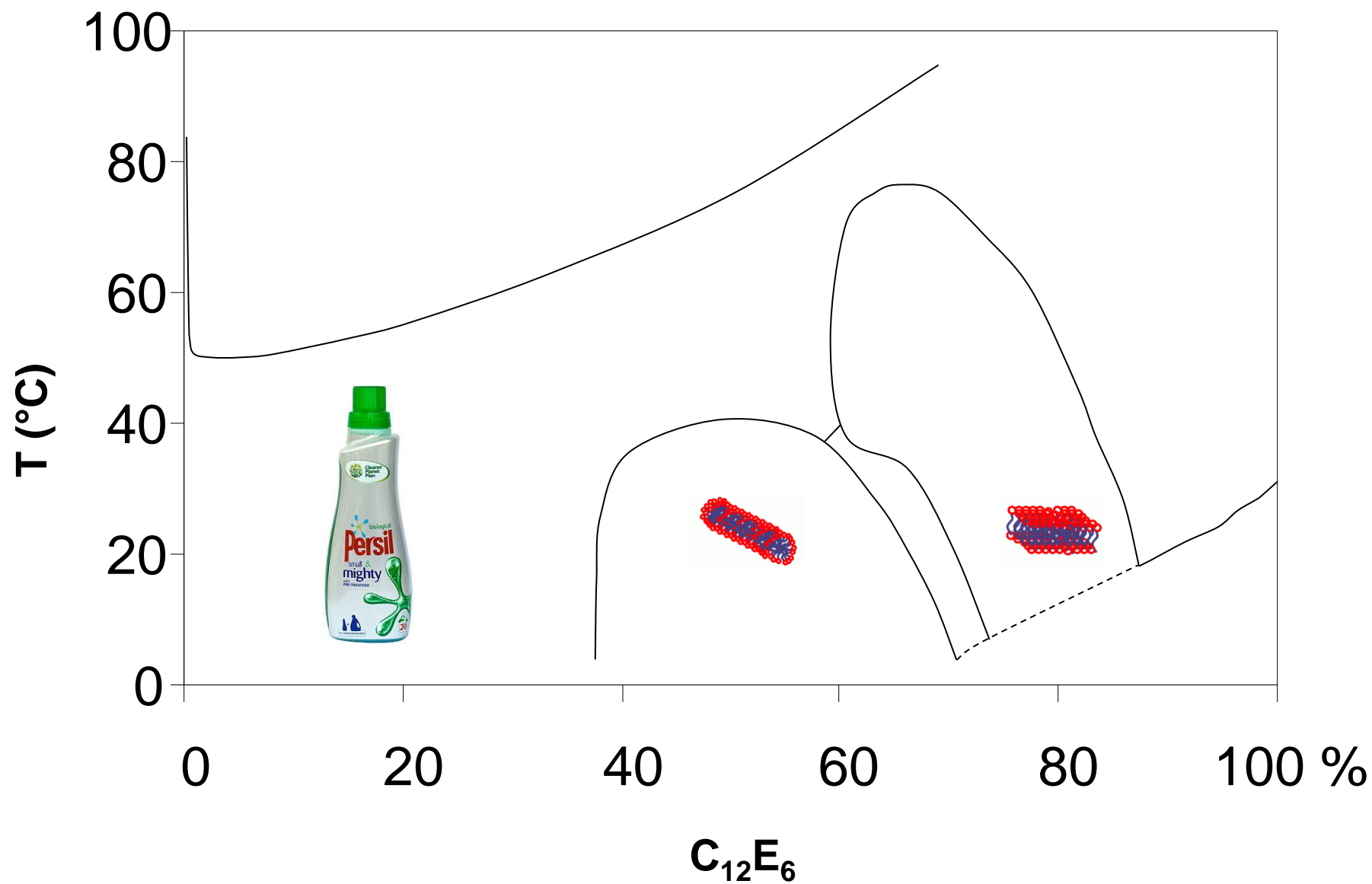
Mesoscale



One millionth of a second (10^{-6} s)



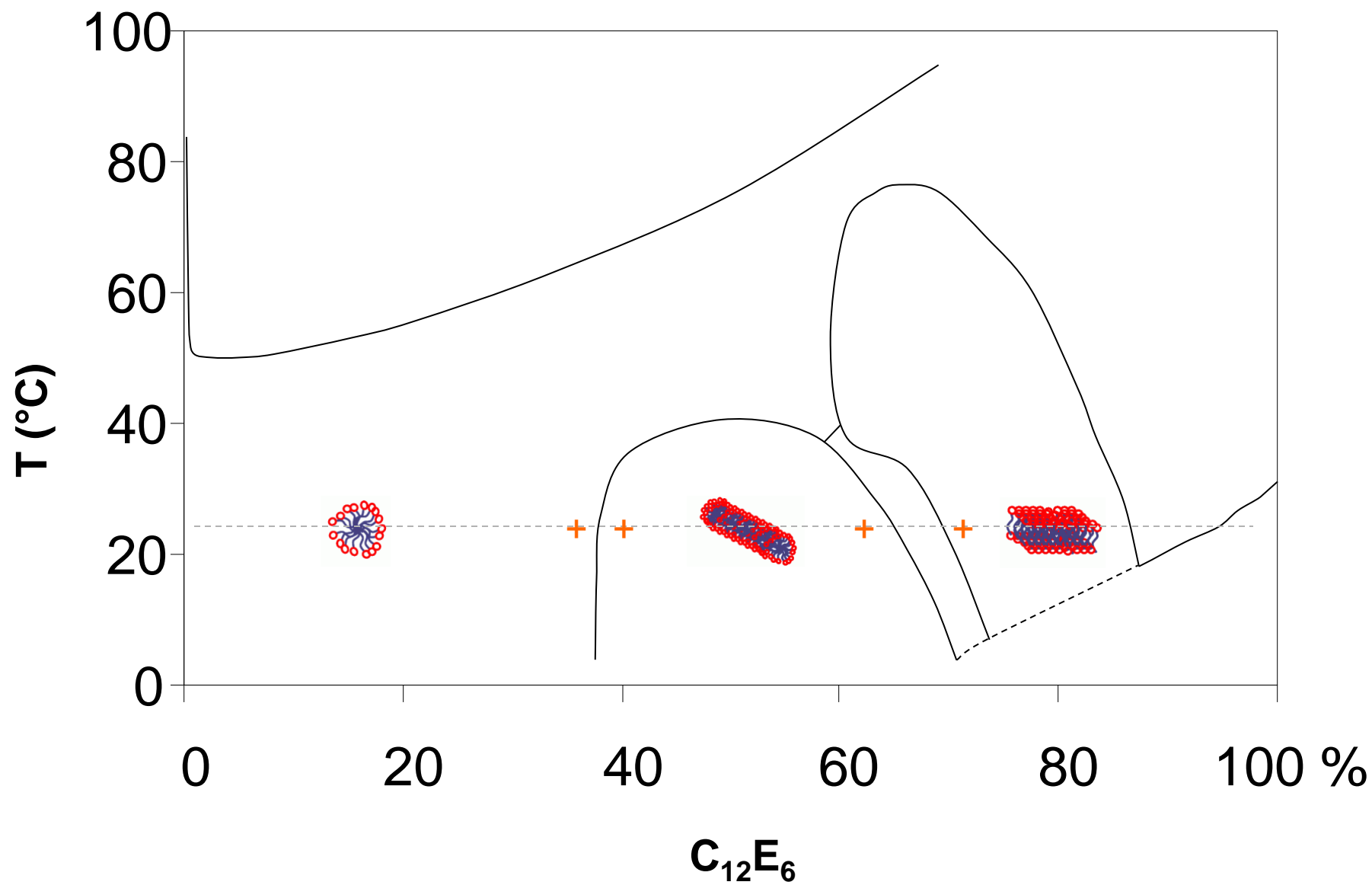
Seconds



Water

Surfactant





Customers, regulators and NGOs increase demands...

WAL★MART



Germany

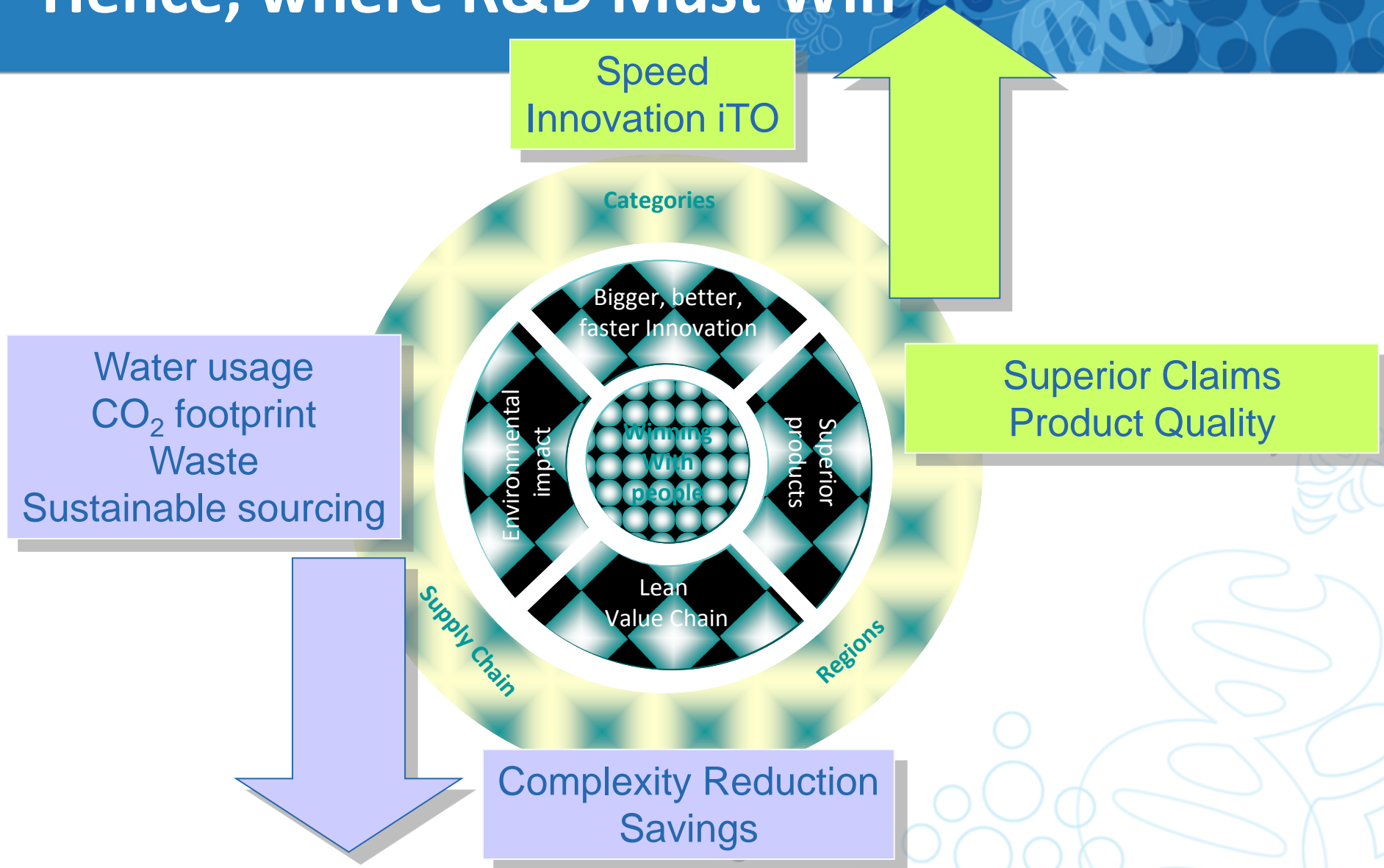


REACH

Registration,
Evaluation
Authorisation &
Restriction of Chemicals



Hence, where R&D Must Win



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From



To

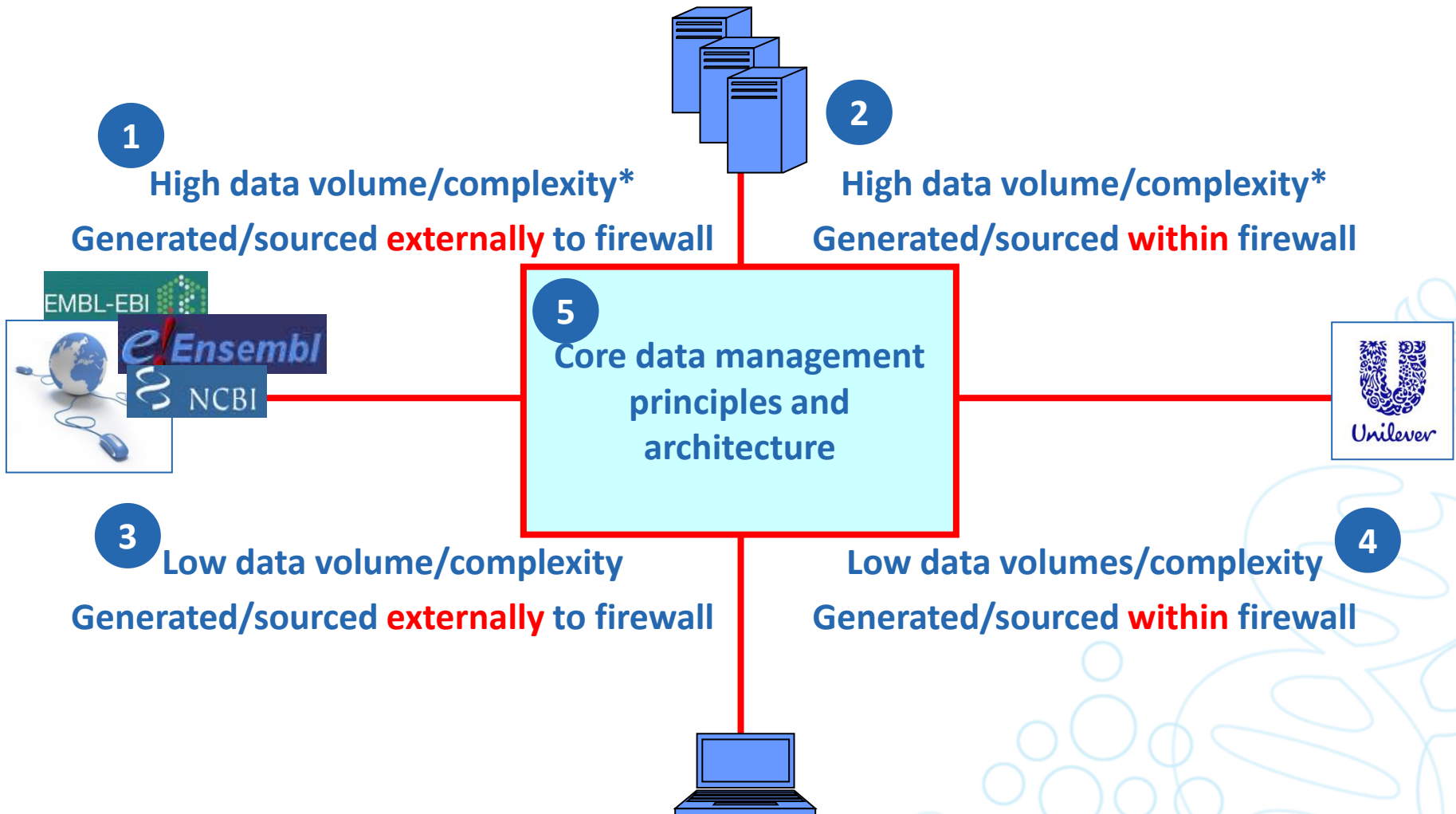


Mission: *“Enable Unilever R&D to deliver outstanding products to the consumer faster than anybody else through unlocking data”*

- Global tools and infrastructure
- New Ways of Working
- Culture and Skills
- Collaboration



Data, Data, Data :



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People, People, People :

1. Upgrade Scientific skills: Working with data and information

- **Doing** 'virtual experiments' using databases
- **Interpreting** data-intensive output

-- new recruits have it, others need to learn it

2. Project workflows: Being data-disciplined

- **Learn** - before starting experimental plan, what do we know?
- **Use** - what's already known, in order to plan & do rapid, effective experiments
- **Share** - data and findings with Project team, and beyond to other current/future Projects
- **Parallel** incorporation of cost, safety, environmental and consumer factors
- **Early access** to global consumer design parameters + feedback

3. MINDSET.....

Our relationship with “Data”

Our relationship with data
needs to change
*what matters is how
people interact with data
& technology*



The relationship needs to
be *mutual*
*value data and get value
from data*