

Communication Design and Visualising Information

May 5, 2016 | Centre for Internet and Society, Bangalore

Presented at the Workshop on Research Methods for Internet Policy in South and Southeast Asia, held on April 14, 2016, at the National Law University Delhi

Broad Principles of Visual Communication

Identifying the Message, Audience and Medium



MESSAGE

Interpretation
Organization
Visual Presentation



AUDIENCE

Language
Experience
Age
Knowledge
Education
Preferences
Expectations
Culture



MEDIUM

Appropriate Medium
(Print, Static, Interactive)
Exploring all Possibilities
of the Medium

Using Design Elements for Communication Goals

COMMUNICATION GOALS

Setting the Context
Clarity of Form and Content
Building Hierarchy
Organization of Content -
Sequence, Categorization

COMPOSITION

Contrast
Consistency
Emphasis

ELEMENTS

Typography
Colour
Space
Scale
Shape
Proportion

The Typography of Paul Rand
with Lewis Blackwell
Shattuck Hall • 7:00 pm
March 30, 2011
Design Lecture Series
Portland State University
Art Department
With wit and wisdom, Blackwell
dissects the patterns of Rand's use of
typography throughout his brands,
book covers, and advertising work.

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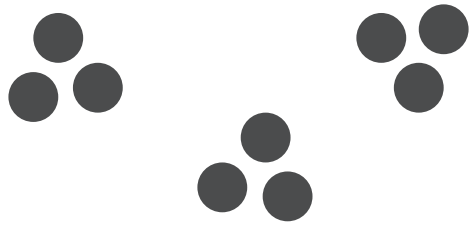
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Organizing the Content

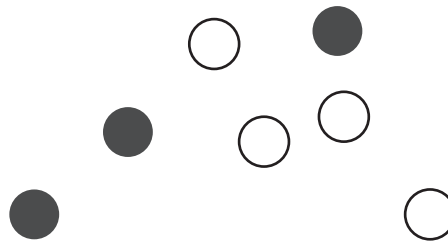
Gestalt Principles of Perception

On the basis of principles of integration and segregation that connect and separate elements through proximity, similarity, and closure



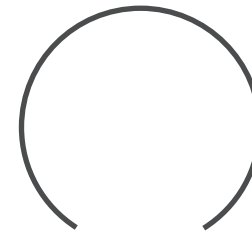
PROXIMITY

The visual system tends to group together those elements that are close to one another, and segregate them from the more distant ones.



SIMILARITY

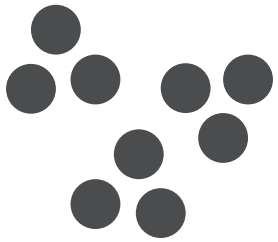
The visual system tends to group together those elements that are equal or similar, and segregate the different ones from one another. This can happen at several levels of similarity based on different visual dimensions (such as color, size, orientation, etc.).



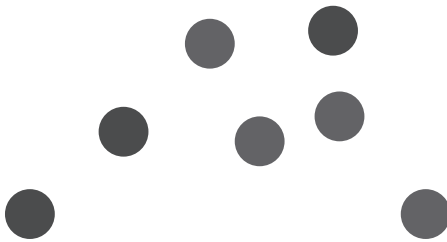
CLOSURE

The visual system tends to group together series of elements that are placed in such a way as to generate a simple outline.

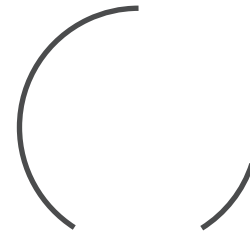
Subtle differences are not helpful



PROXIMITY?



SIMILARITY?



CLOSURE?

Eternamente joven

La cultura pop con motor nació hace seis décadas en Italia. La llamaron Vespa por su parecido con una avispa, un insecto rápido y ágil al que la naturaleza dotó de un diseño único. Como a su hermana de metal. POR J. DE VELASCO Y M. JIMÉNEZ

Diversida, moderna y juvenil. Así es la Vespa, una moto que cumple ahora 60 años de vida, pero que no parece estar dispuesta a jubilarse. La primera moto salió de una fábrica de Pontedera, una ciudad cercana a Pisa, en la que antes de la II Guerra Mundial se fabricaban accesorios navales, vagones de trenes y maquinaria bélica. Tras la contienda, Italia era un país devastado y a las empresas no les quedó más remedio que imaginar productos de uso básico. La Vespa fue uno de ellos. Generaciones de todo el mundo la han conducido desde entonces durante décadas, pero la irrupción de nuevos scooters procedentes de Asia, más económicos y rápidos, alejaron de nuestras ciudades al más cuando de todos.

Lo que empezó como un objeto para la clase obrera ha ido evolucionando con sus usuarios. Primero fue el vehículo de los que eran incapaces de adquirir un coche; luego pasó a ser un símbolo de juventud y libertad que hacía furor entre tribus urbanas. Ya en los 80, se convirtió en el sueño del pijo, ansioso de colocar en ella una pegatina de Shoggy. Actualmente, la máquina ha superado cualquier barrera social y es indiscutiblemente un objeto de culto que genera simpatías allá por donde pasa. Ágil y con un ruido de motor inconfundible, está hecha para disfrutarla sin prisas, perfecta para evitar atascos.



"¡Parece una avispa!"

Con esta exclamación quedó bautizada la moto más popular de la historia. Enrico Piaggio reaccionó así al ver el diseño del proyecto. El nuevo vehículo, al igual que el insecto, es independiente y se mueve velozmente entre el tráfico. El nombre le vino al pelo.



Posición de conducción
Muy cómoda, se puede montar incluso con falda.

Transmisión
No necesita cadena porque el motor se aloja sobre el eje trasero.



La Vespa ha sido la base para un sinnúmero de transformaciones a lo largo de su historia: helicóptero, limusina, motocarro, Lego, carenado futurista e incluso tanque.

Dónde se ha fabricado



Fenómeno mundial

17 millones de unidades vendidas y 140 versiones lanzadas en hasta 114 países han convertido la Vespa en uno de los utilitarios más populares de la historia.



Volkswagen GOLF (1984) 24 millones



Volkswagen T3 (1980-2000) 22,5 millones



Piaggio VESPA (1946) 17 millones



Ford T (1908-1927) 16,5 millones

Cóncavos
Su forma abombada, herencia de la aerodinámica, mejora la refrigeración del motor.

Rueda de repuesto
Junto al motor lleva un recambio de fácil sustitución en caso de pinchazo.

Sin chasis
Es la carrocería metálica la que hace de bastidor de la moto, en vez de un sistema de tubos.

Monopatín
Adopta el sistema del tren de aterrizaje delantero de los aviones.

Vespa GT-60
Piaggio ha creado esta versión, con una estética retro, para conmemorar el 60 aniversario.



Ficha técnica
Cilindrado 244 cc
Potencia 22 CV
Peso 150 kg
Velocidad máx. 122 km/h

Faro delantero
En los primeros años iba colocado sobre el guardabarros.



Una moto de cine

Desde que Gregory Peck y Audrey Hepburn condujeran una Vespa en "Vacaciones en Roma", la avispa motorizada ha pasado al menos 80 castings de películas de éxito. Sus curvas se han dejado ver en "Atrapa a un ladrón" de Hitchcock, "La dulce vida" de Fellini, "American Graffiti", "Quadrophenia" - imprescindible para los fanáticos del scooter italiano - o "Scarface". Toda una carrera estelar a la que sólo le falta ganar un Oscar.

Se crea Piaggio
Fabrica accesorios navales, para el ferrocarril e incluso armas y aviones militares.

Nace la Vespa
En abril se producen las 15 primeras unidades de la fábrica de Pontedera.

Primer club Vespa
Y después de éste, en Italia, han surgido cientos por todo el mundo.

Moto Vespa España
Se abre una fábrica en Madrid.

"Vacaciones en Roma"
Hollywood immortaliza este scooter por las calles de la capital italiana.



"Quadrophenia"
Se estrena un filme de culto para los fans del mundo Vespa.

Vuelta al mundo
Giorgio Bettinelli recorre 254.000 km por todo el planeta.

60 aniversario
Salen las versiones conmemorativas LX-60 y GT-60.

1884

1946

1948

1952

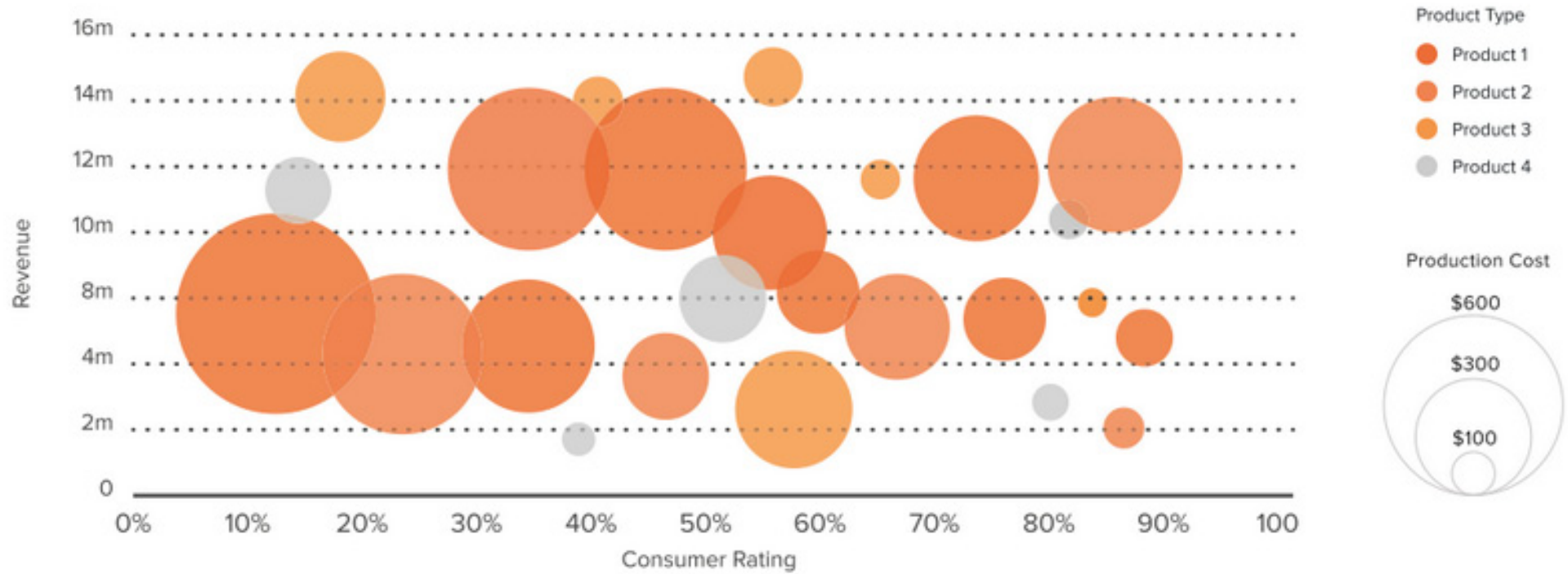
1953

1979

1992-2000

2006

REVENUE VS. RATING



Visualising Data

Types of Data

Nominal - Eg. Male, Female

Ordinal - Eg. Abundant, Common, Rare

Quantitative

Relational - Eg. Networks

Spatial - Eg. Maps

Identifying the Purpose

“What do I know, what does it mean, and why do I believe it’s important?”



Comparisons



Proportions



Relationships



Hierarchy



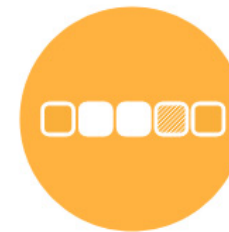
How things work



Processes & methods



Movement or flow



Patterns



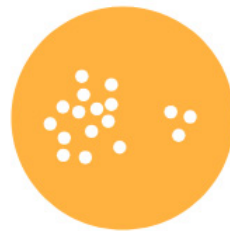
Concepts



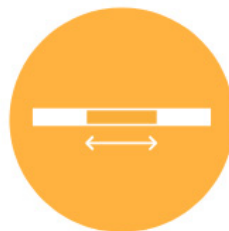
Location



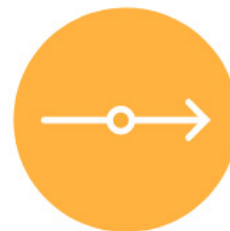
Part-to-a-whole



Distribution



Range



Data over time



Analysing text

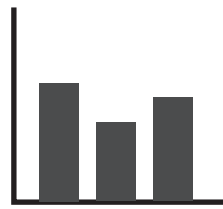


Reference tool

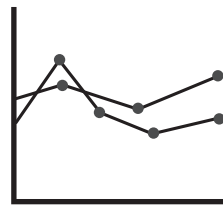
Using the Most Effective Format



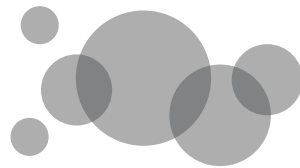
Allows more accurate comparisons



2D position along a common aligned scale



Slopes



Areas



Colour Intensity

Allows more generic comparisons



Colour Hue

Using elements based on the purpose of the visualization

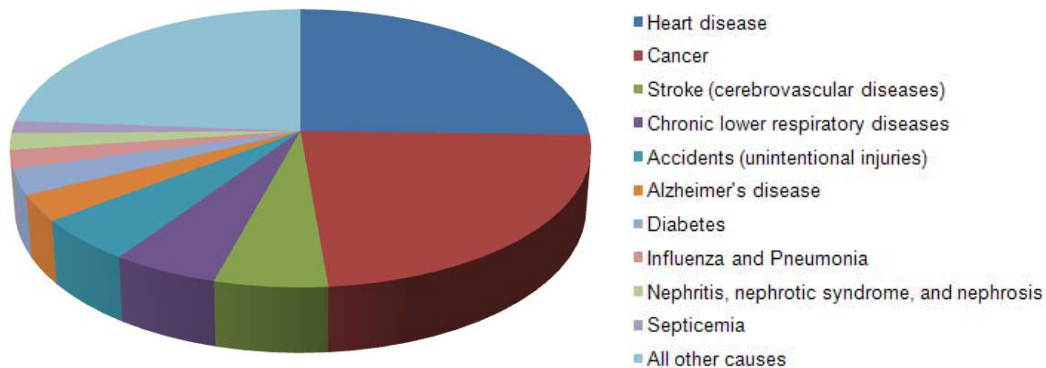
Choosing the Most Effective Format for Data Visualisation

Assessing the Type of Data

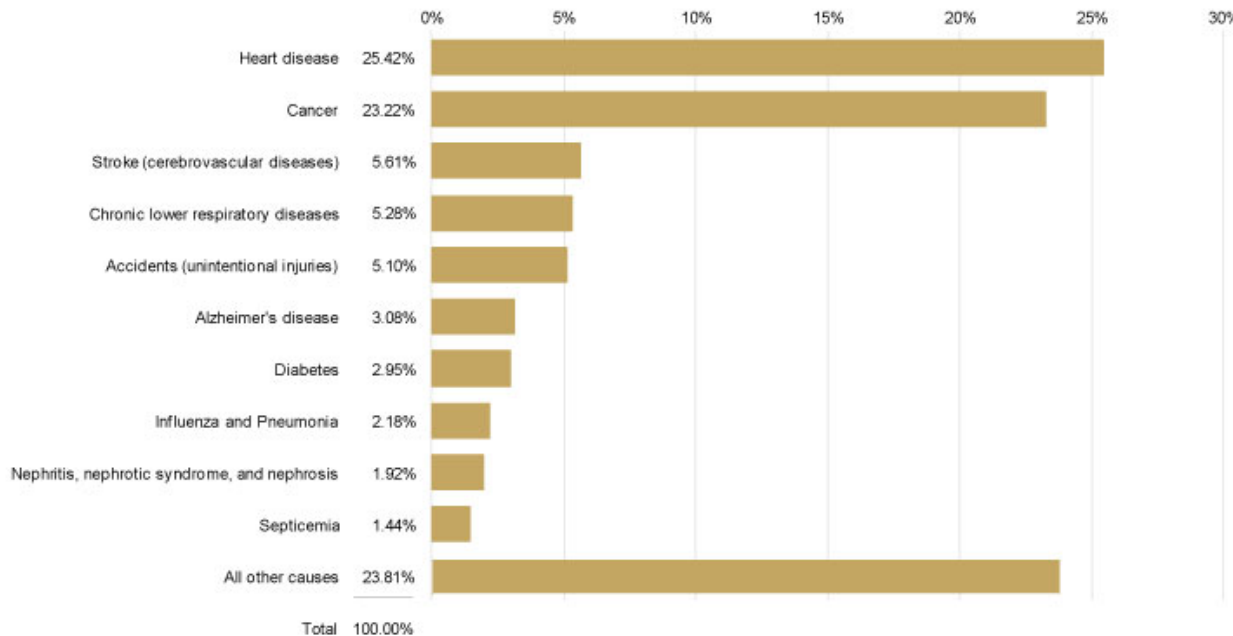
Identifying the Purpose/ Message

Identifying the Accuracy required in the Data Representation

Total Deaths in America by Cause in 2007



Total Deaths in America by Cause in 2007



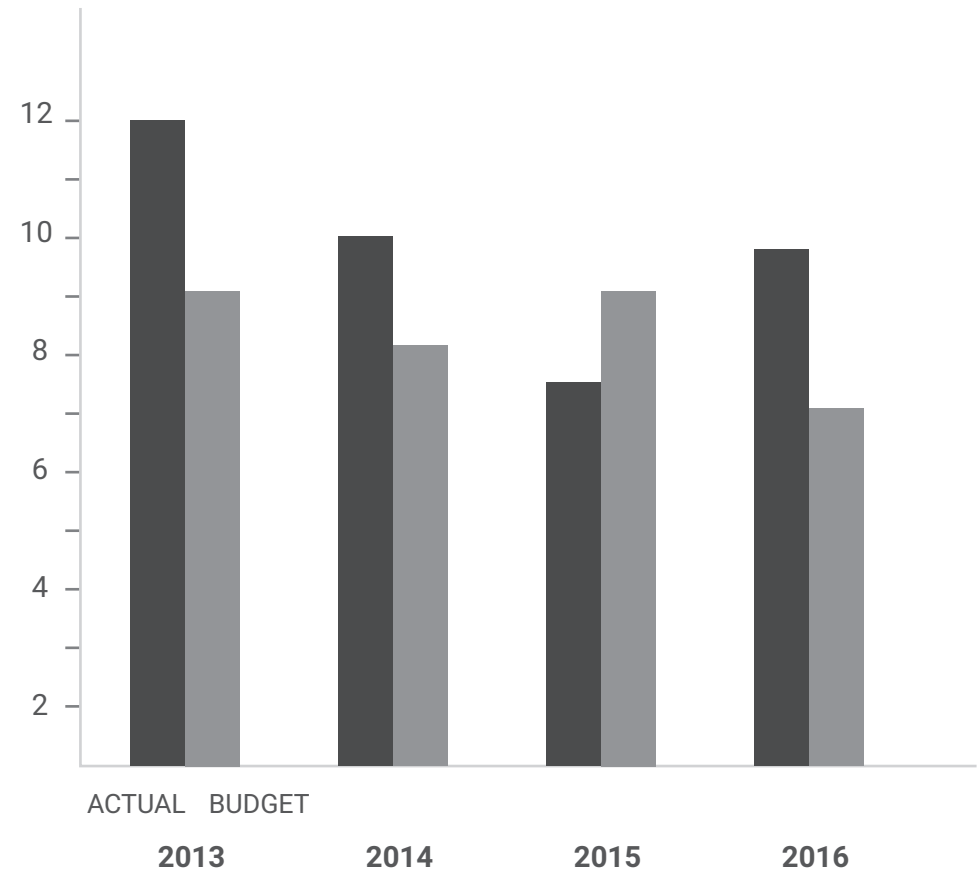
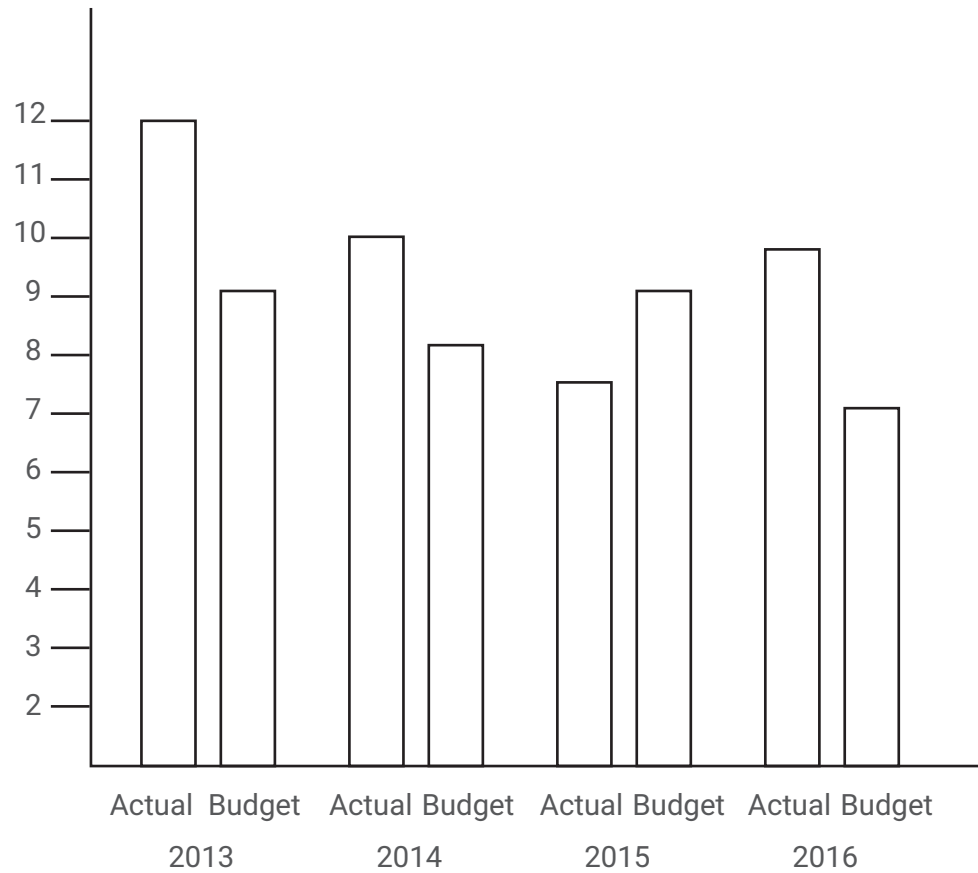
CRITERIA FOR EVALUATING THE VISUALIZATION

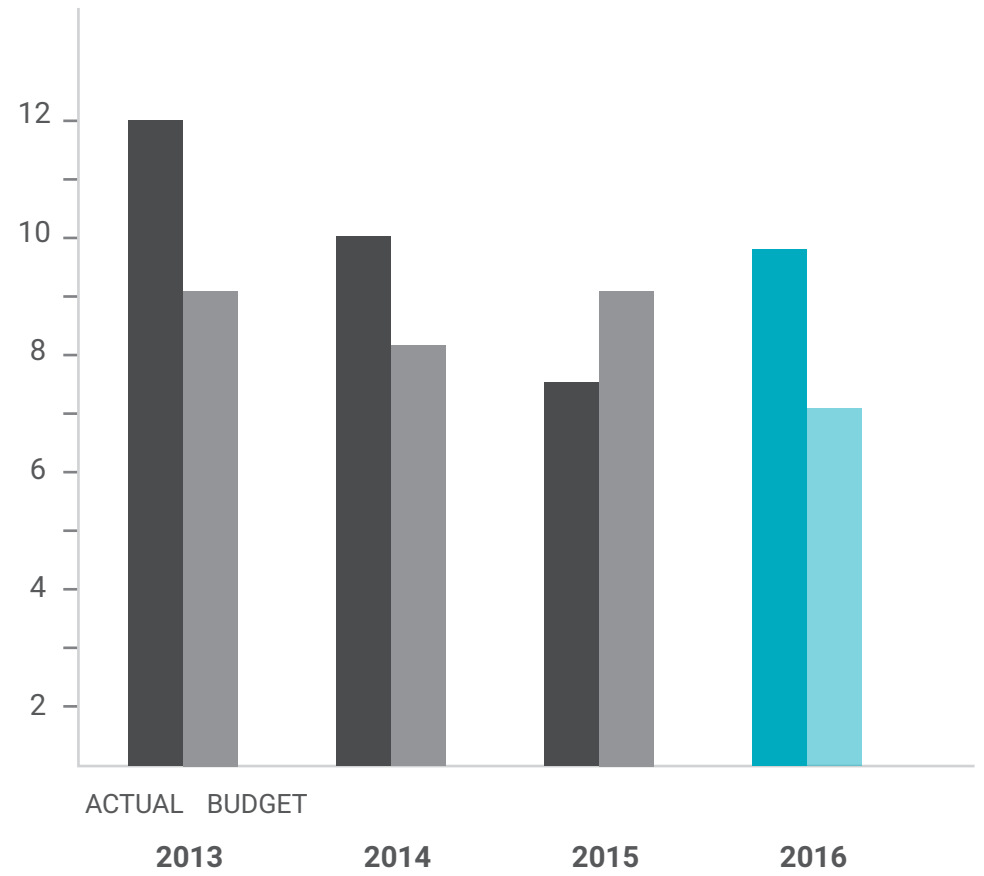
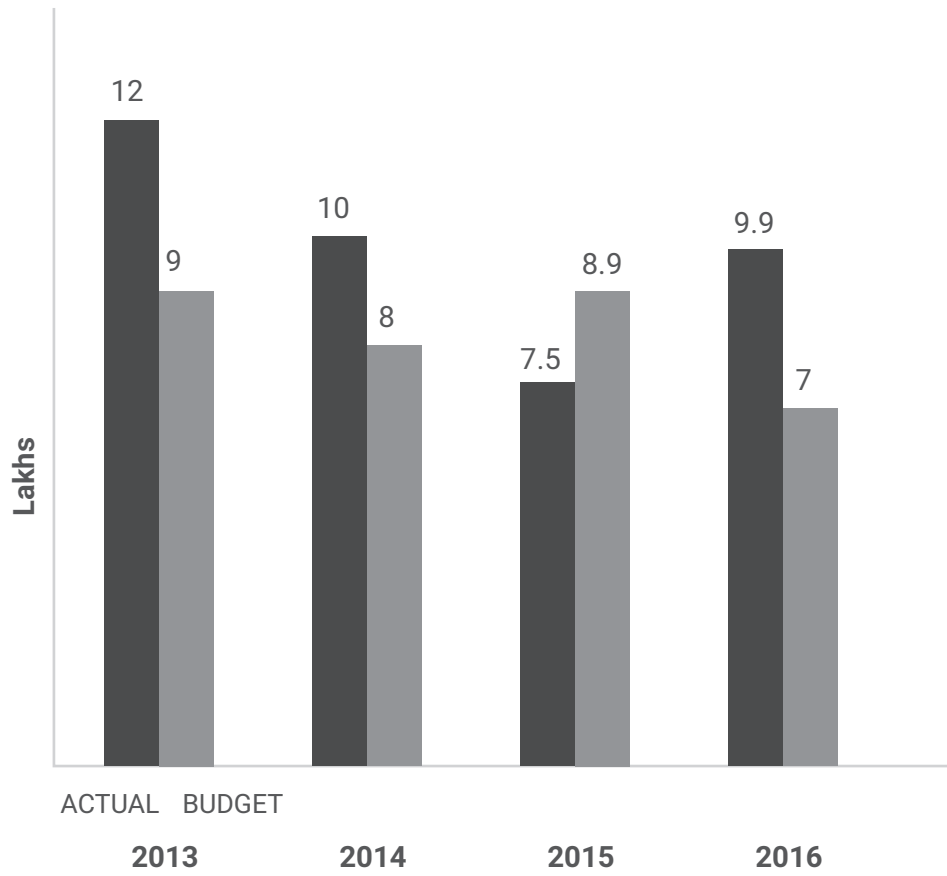
- Clearly indicates how the values relate to one another, which in this case is a part-to-whole relationship
- Represents the quantities accurately
- Makes it easy to compare the quantities
- Makes it easy to see the ranked order of values
- Makes obvious how people should use the information - what they should use it to accomplish - and encourages them to do this

Source: <https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/data-visualization-for-human-perception>

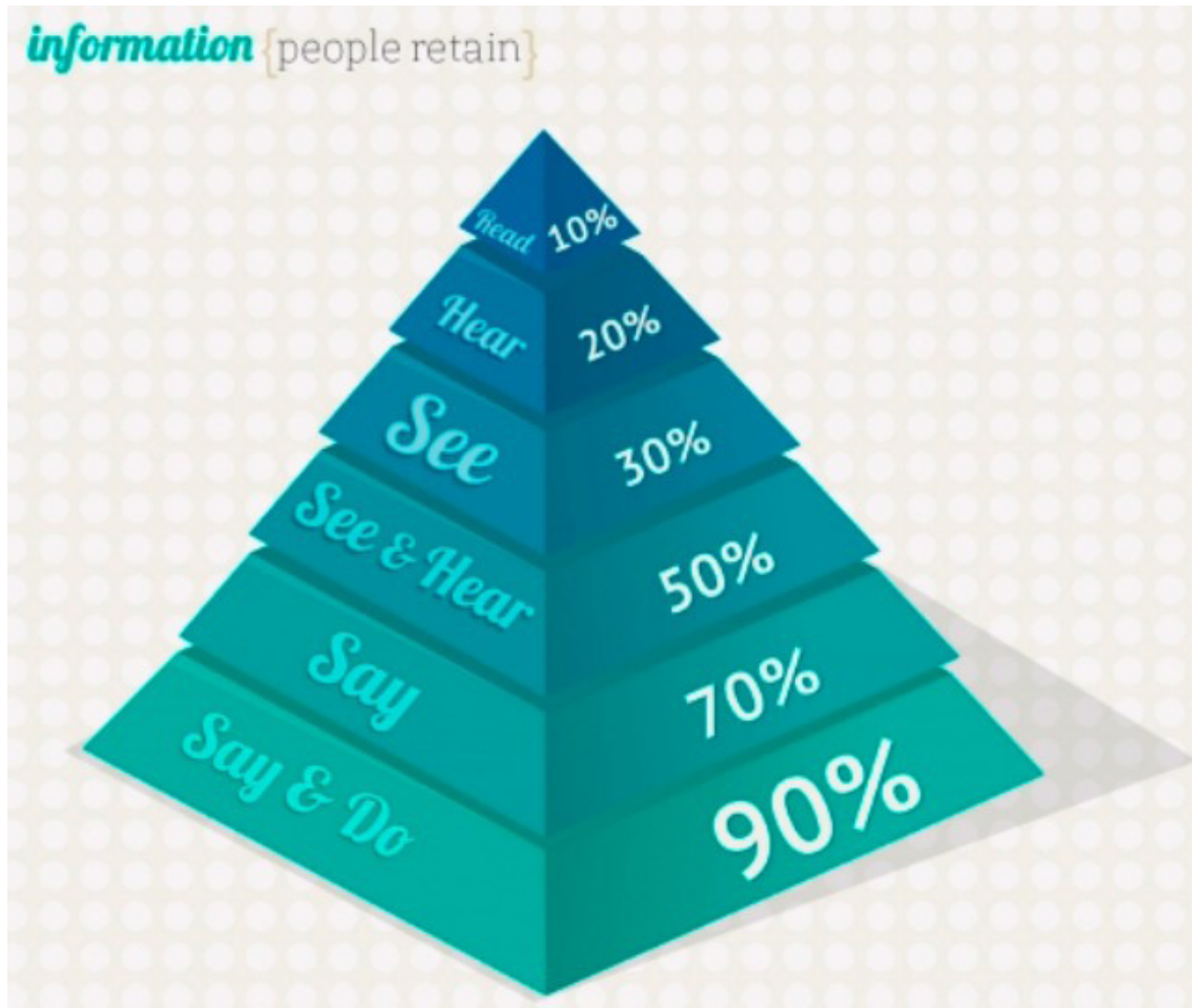
Aesthetics & Functionality of Visualisations

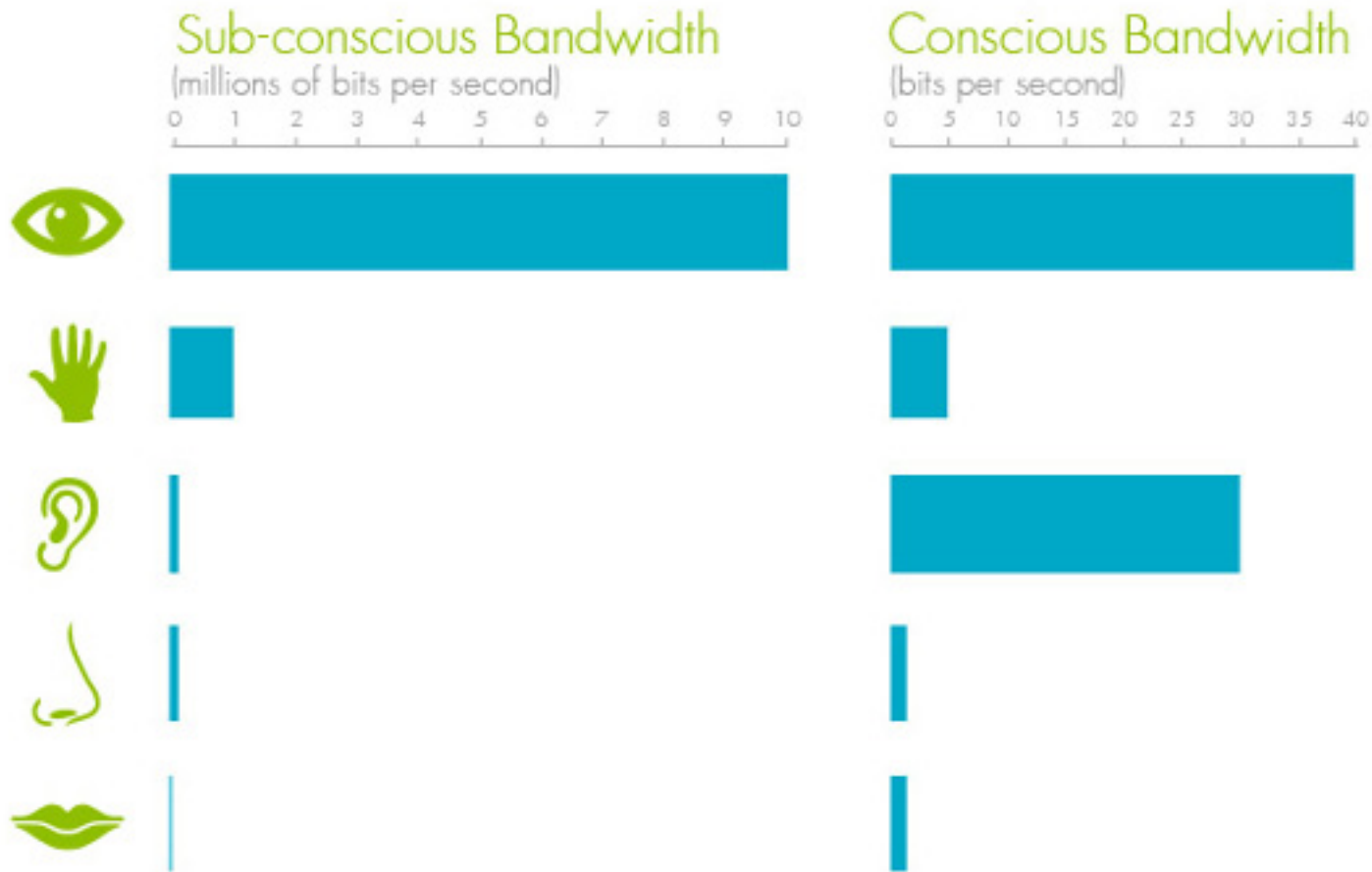
Reducing Redundancy, Increasing Emphasis





Aesthetics in the Way of Sense Making

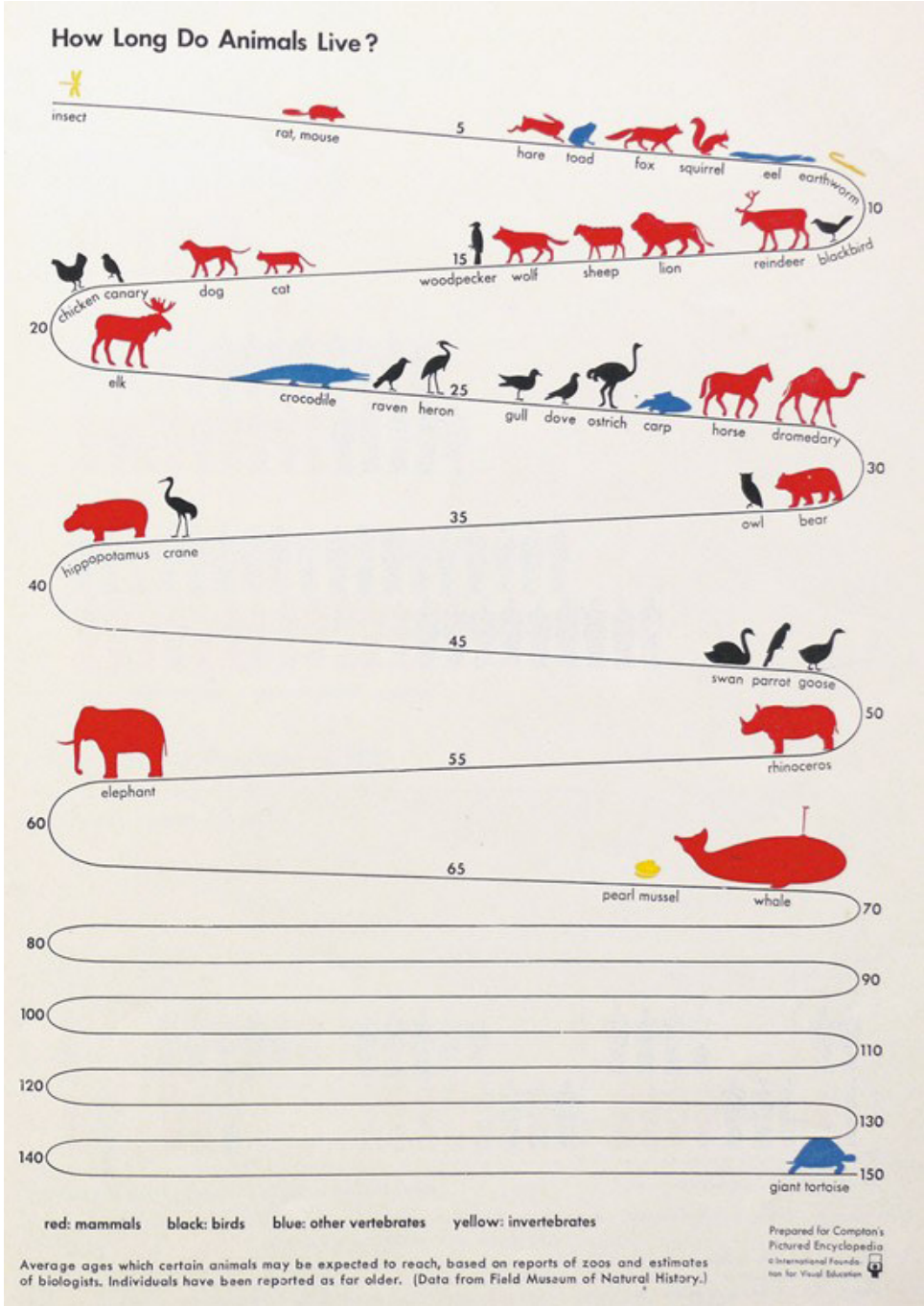




Visual Strength & Aesthetics to Support the Communication Function

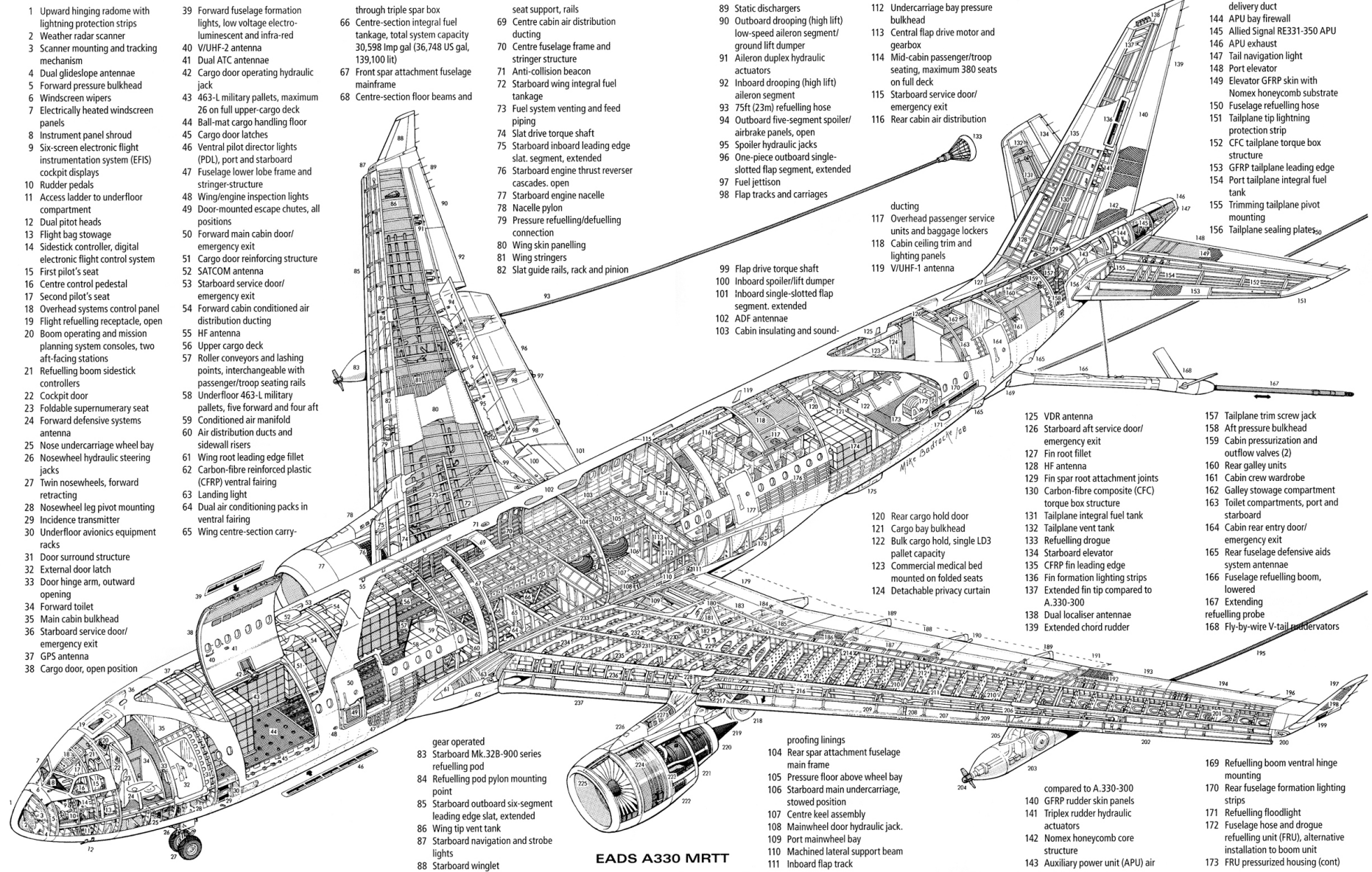
Sensory bandwidths reaching sub-conscious and conscious mind, from Tor Norretranders' The User Illusion. Visualization from Stephen Few's Information Dashboard Design

Use of icons and pictograms when necessary



How long do animals live? 1939, Designed by Gerd Arntz, Uses the ISOTYPE Technique

<https://www.brainpickings.org/2011/03/08/the-transformer-isotype/>
<http://www.gerdarntz.org/content/gerd-arntz#isotype>



- 1 Upward hinging radome with lightning protection strips
- 2 Weather radar scanner
- 3 Scanner mounting and tracking mechanism
- 4 Dual glideslope antennae
- 5 Forward pressure bulkhead
- 6 Windscreens wipers
- 7 Electrically heated windscreens panels
- 8 Instrument panel shroud
- 9 Six-screen electronic flight instrumentation system (EFIS) cockpit displays
- 10 Rudder pedals
- 11 Access ladder to underfloor compartment
- 12 Dual pitot heads
- 13 Flight bag stowage
- 14 Sidestick controller, digital electronic flight control system
- 15 First pilot's seat
- 16 Centre control pedestal
- 17 Second pilot's seat
- 18 Overhead systems control panel
- 19 Flight refuelling receptacle, open
- 20 Boom operating and mission planning system consoles, two aft-facing stations
- 21 Refuelling boom sidestick controllers
- 22 Cockpit door
- 23 Foldable supernumerary seat
- 24 Forward defensive systems antenna
- 25 Nose undercarriage wheel bay
- 26 Nosewheel hydraulic steering jacks
- 27 Twin nosewheels, forward retracting
- 28 Nosewheel leg pivot mounting
- 29 Incidence transmitter
- 30 Underfloor avionics equipment racks
- 31 Door surround structure
- 32 External door latch
- 33 Door hinge arm, outward opening
- 34 Forward toilet
- 35 Main cabin bulkhead
- 36 Starboard service door/emergency exit
- 37 GPS antenna
- 38 Cargo door, open position

- 39 Forward fuselage formation lights, low voltage electro-luminescent and infra-red
- 40 V/UHF-2 antenna
- 41 Dual ATC antennae
- 42 Cargo door operating hydraulic jack
- 43 463-L military pallets, maximum 26 on full upper-cargo deck
- 44 Ball-mat cargo handling floor
- 45 Cargo door latches
- 46 Ventral pilot director lights (PDL), port and starboard
- 47 Fuselage lower lobe frame and stringer-structure
- 48 Wing/engine inspection lights
- 49 Door-mounted escape chutes, all positions
- 50 Forward main cabin door/emergency exit
- 51 Cargo door reinforcing structure
- 52 SATCOM antenna
- 53 Starboard service door/emergency exit
- 54 Forward cabin conditioned air distribution ducting
- 55 HF antenna
- 56 Upper cargo deck
- 57 Roller conveyors and lashing points, interchangeable with passenger/troop seating rails
- 58 Underfloor 463-L military pallets, five forward and four aft
- 59 Conditioned air manifold
- 60 Air distribution ducts and sidewall risers
- 61 Wing root leading edge fillet
- 62 Carbon-fibre reinforced plastic (CFRP) ventral fairing
- 63 Landing light
- 64 Dual air conditioning packs in ventral fairing
- 65 Wing centre-section carry-through triple spar box

- 66 Centre-section integral fuel tankage, total system capacity 30,598 Imp gal (36,748 US gal, 139,100 lit)
- 67 Front spar attachment fuselage mainframe
- 68 Centre-section floor beams and seat support, rails
- 69 Centre cabin air distribution ducting
- 70 Centre fuselage frame and stringer structure
- 71 Anti-collision beacon
- 72 Starboard wing integral fuel tankage
- 73 Fuel system venting and feed piping
- 74 Slat drive torque shaft
- 75 Starboard inboard leading edge slat, segment, extended
- 76 Starboard engine thrust reverser cascades, open
- 77 Starboard engine nacelle
- 78 Nacelle pylon
- 79 Pressure refuelling/defuelling connection
- 80 Wing skin panelling
- 81 Wing stringers
- 82 Slat guide rails, rack and pinion

- 83 Starboard Mk.32B-900 series refuelling pod
- 84 Refuelling pod pylon mounting point
- 85 Starboard outboard six-segment leading edge slat, extended
- 86 Wing tip vent tank
- 87 Starboard navigation and strobe lights
- 88 Starboard winglet
- 89 Static dischargers
- 90 Outboard drooping (high lift) low-speed aileron segment/ground lift dumper
- 91 Aileron duplex hydraulic actuators
- 92 Inboard drooping (high lift) aileron segment
- 93 75ft (23m) refuelling hose
- 94 Outboard five-segment spoiler/airbrake panels, open
- 95 Spoiler hydraulic jacks
- 96 One-piece outboard single-slotted flap segment, extended
- 97 Fuel jettison
- 98 Flap tracks and carriages
- 99 Flap drive torque shaft
- 100 Inboard spoiler/lift dumper
- 101 Inboard single-slotted flap segment, extended
- 102 ADF antennae
- 103 Cabin insulating and sound-

- 104 Rear spar attachment fuselage main frame
- 105 Pressure floor above wheel bay
- 106 Starboard main undercarriage, stowed position
- 107 Centre keel assembly
- 108 Mainwheel door hydraulic jack.
- 109 Port mainwheel bay
- 110 Machined lateral support beam
- 111 Inboard flap track
- 112 Undercarriage bay pressure bulkhead
- 113 Central flap drive motor and gearbox
- 114 Mid-cabin passenger/troop seating, maximum 380 seats on full deck
- 115 Starboard service door/emergency exit
- 116 Rear cabin air distribution ducting
- 117 Overhead passenger service units and baggage lockers
- 118 Cabin ceiling trim and lighting panels
- 119 V/UHF-1 antenna
- 120 Rear cargo hold door
- 121 Cargo bay bulkhead
- 122 Bulk cargo hold, single LD3 pallet capacity
- 123 Commercial medical bed mounted on folded seats
- 124 Detachable privacy curtain
- 125 VDR antenna
- 126 Starboard aft service door/emergency exit
- 127 Fin root fillet
- 128 HF antenna
- 129 Fin spar root attachment joints
- 130 Carbon-fibre composite (CFC) torque box structure
- 131 Tailplane integral fuel tank
- 132 Tailplane vent tank
- 133 Refuelling drogue
- 134 Starboard elevator
- 135 CFRP fin leading edge
- 136 Fin formation lighting strips
- 137 Extended fin tip compared to A.330-300
- 138 Dual localiser antennae
- 139 Extended chord rudder

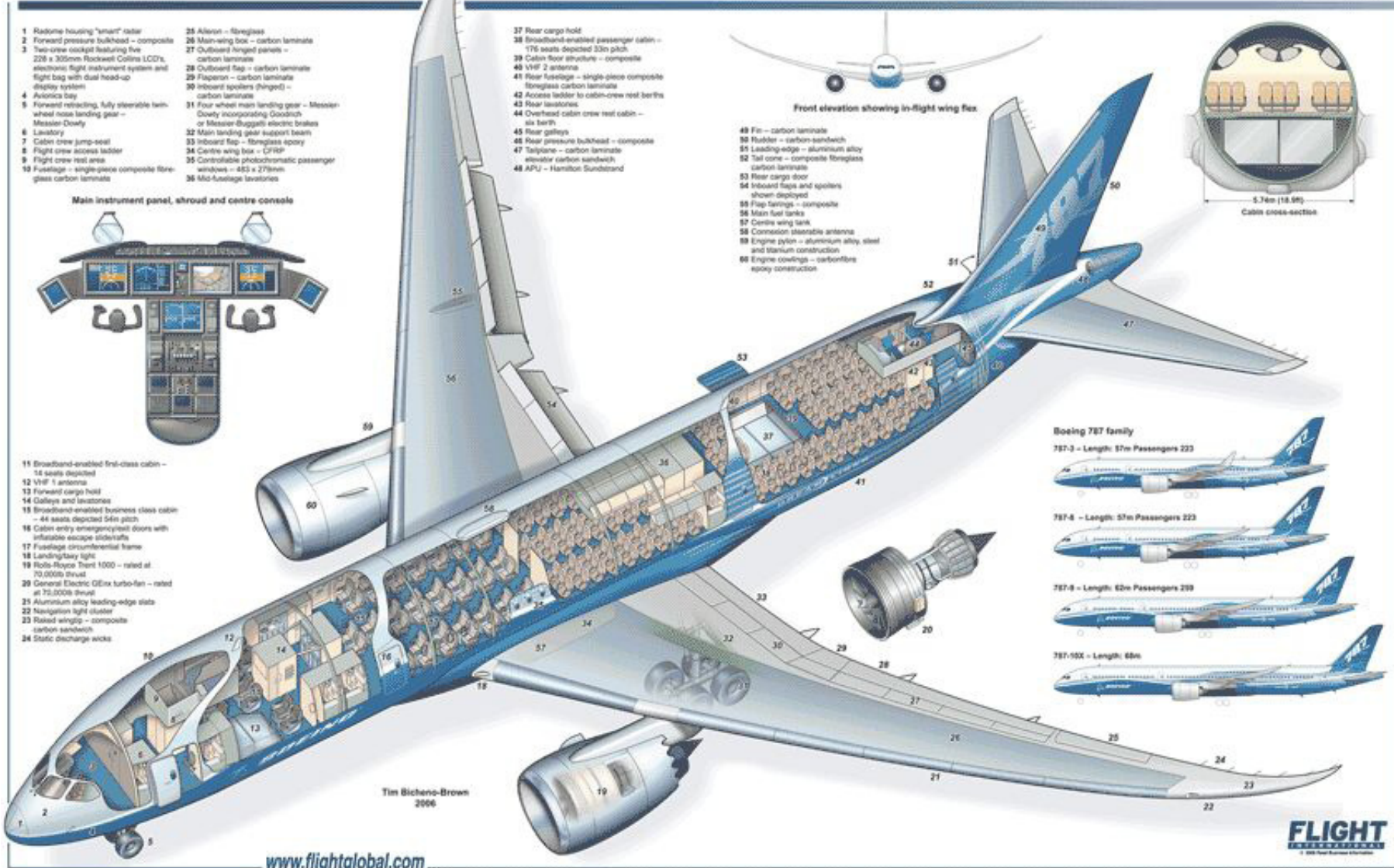
- 140 GFRP rudder skin panels
- 141 Triplex rudder hydraulic actuators
- 142 Nomex honeycomb core structure
- 143 Auxiliary power unit (APU) air delivery duct
- 144 APU bay firewall
- 145 Allied Signal RE331-350 APU
- 146 APU exhaust
- 147 Tail navigation light
- 148 Port elevator
- 149 Elevator GFRP skin with Nomex honeycomb substrate
- 150 Fuselage refuelling hose
- 151 Tailplane tip lightning protection strip
- 152 CFC tailplane torque box structure
- 153 GFRP tailplane leading edge
- 154 Port tailplane integral fuel tank
- 155 Trimming tailplane pivot mounting
- 156 Tailplane sealing plates
- 157 Tailplane trim screw jack
- 158 Aft pressure bulkhead
- 159 Cabin pressurization and outflow valves (2)
- 160 Rear galley units
- 161 Cabin crew wardrobe
- 162 Galley storage compartment
- 163 Toilet compartments, port and starboard
- 164 Cabin rear entry door/emergency exit
- 165 Rear fuselage defensive aids system antennae
- 166 Fuselage refuelling boom, lowered
- 167 Extending refuelling probe
- 168 Fly-by-wire V-tail servodators

- 169 compared to A.330-300
- 170 Rear fuselage formation lighting strips
- 171 Refuelling floodlight
- 172 Fuelage hose and drogue refuelling unit (FRU), alternative installation to boom unit
- 173 FRU pressurized housing (cont)

EADS A330 MRTT

Cut-away diagram showing aeroplane parts

BOEING 787-8



- 1 Radome housing "smart" radar
- 2 Forward pressure bulkhead - composite
- 3 Two-crew cockpit featuring five 226 x 305mm Rockwell Collins LCDs, electronic flight instrument system and flight bag with dual head-up display system
- 4 Avionics bay
- 5 Forward retracting, fully steerable twin-wheel nose landing gear - Messier-Dowty
- 6 Lavatory
- 7 Cabin crew jump-seat
- 8 Flight crew access ladder
- 9 Flight crew rest area
- 10 Fuselage - single-piece composite fiberglass carbon laminate

Main instrument panel, shroud and centre console

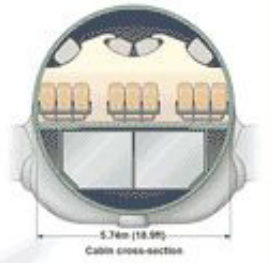


- 11 Broadband-enabled first-class cabin - 14 seats depicted
- 12 VHF 1 antenna
- 13 Forward cargo hold
- 14 Galleys and lavatories
- 15 Broadband-enabled business class cabin - 44 seats depicted 54in pitch
- 16 Cabin entry emergency/exit doors with inflatable escape slides
- 17 Fuselage circumferential frame
- 18 Landing/taxi light
- 19 Rolls-Royce Trent 1000 - rated at 70,000lb thrust
- 20 General Electric GE9X turbo-fan - rated at 73,000lb thrust
- 21 Aluminum alloy leading-edge slats
- 22 Navigation light cluster
- 23 Raked wingtip - composite carbon sandwich
- 24 Static discharge wicks

- 25 Aileron - fiberglass
- 26 Main-wing box - carbon laminate
- 27 Outboard longed panels - carbon laminate
- 28 Outboard flap - carbon laminate
- 29 Flaperon - carbon laminate
- 30 Inboard spoilers (winged) - carbon laminate
- 31 Four wheel main landing gear - Messier-Dowty incorporating Goodrich or Messier-Bugatti electric brakes
- 32 Main landing gear support beam
- 33 Inboard flap - fiberglass epoxy
- 34 Centre wing box - CFRP
- 35 Controllable photochromatic passenger windows - 483 x 279mm
- 36 Mid-fuselage lavatories



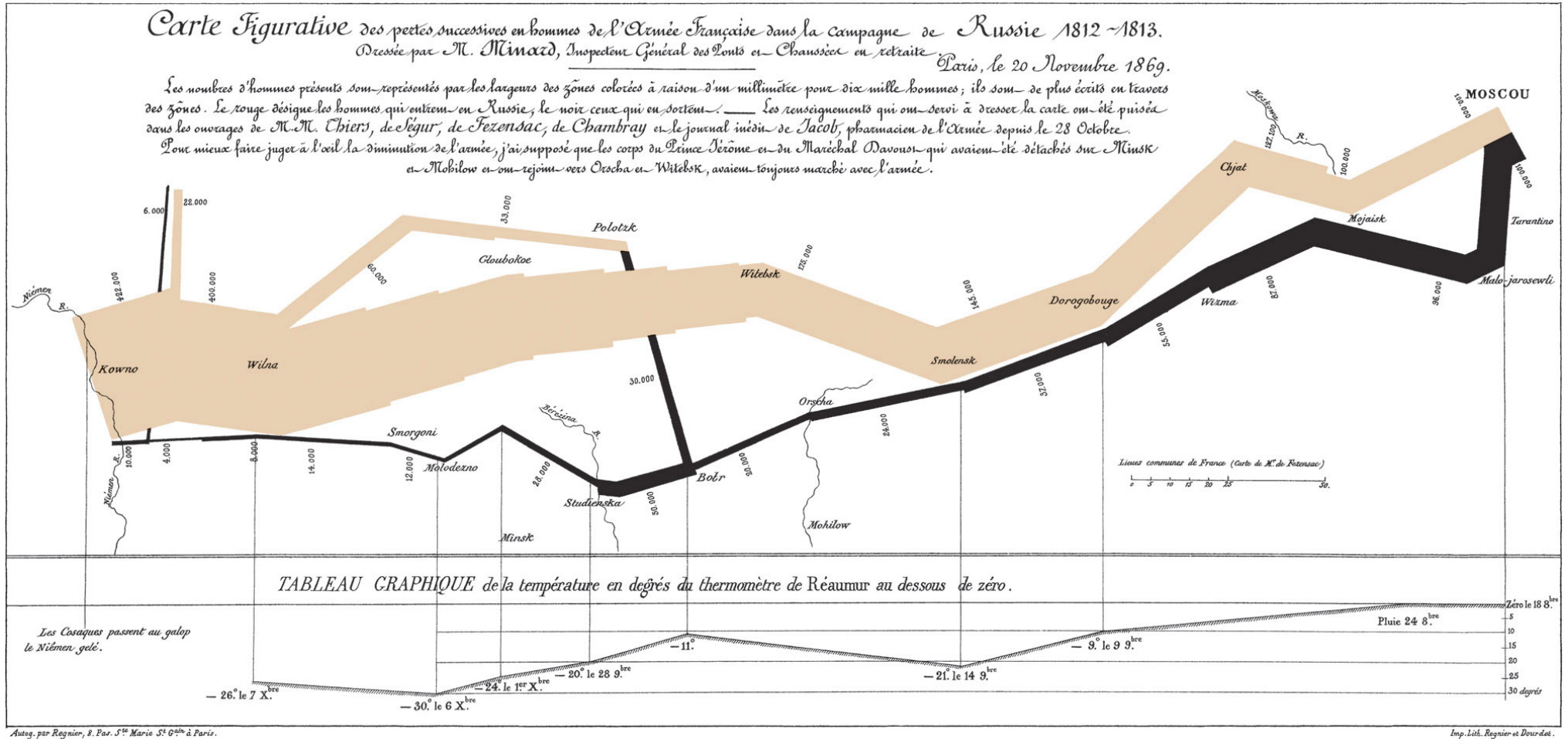
- 37 Rear cargo hold
- 38 Broadband-enabled passenger cabin - 176 seats depicted 33in pitch
- 39 Cabin floor structure - composite
- 40 VHF 2 antenna
- 41 Rear fuselage - single-piece composite fiberglass carbon laminate
- 42 Access ladder to cabin-crew rest berths
- 43 Rear lavatories
- 44 Overhead cabin crew rest cabin - six berths
- 45 Rear galleys
- 46 Rear pressure bulkhead - composite
- 47 Tailplane - carbon laminate elevator carbon sandwich
- 48 APU - Hamilton Sundstrand



Cut-away diagram showing aeroplane parts
<http://infographics-inspiration.blogspot.in/search/label/technology>

Aesthetics to make information more engaging

Layering Information, Retaining Simplicity



Charles Minard's 1869 chart showing the number of men in Napoleon's 1812 Russian campaign army, their movements, as well as the temperature they encountered on the return path.

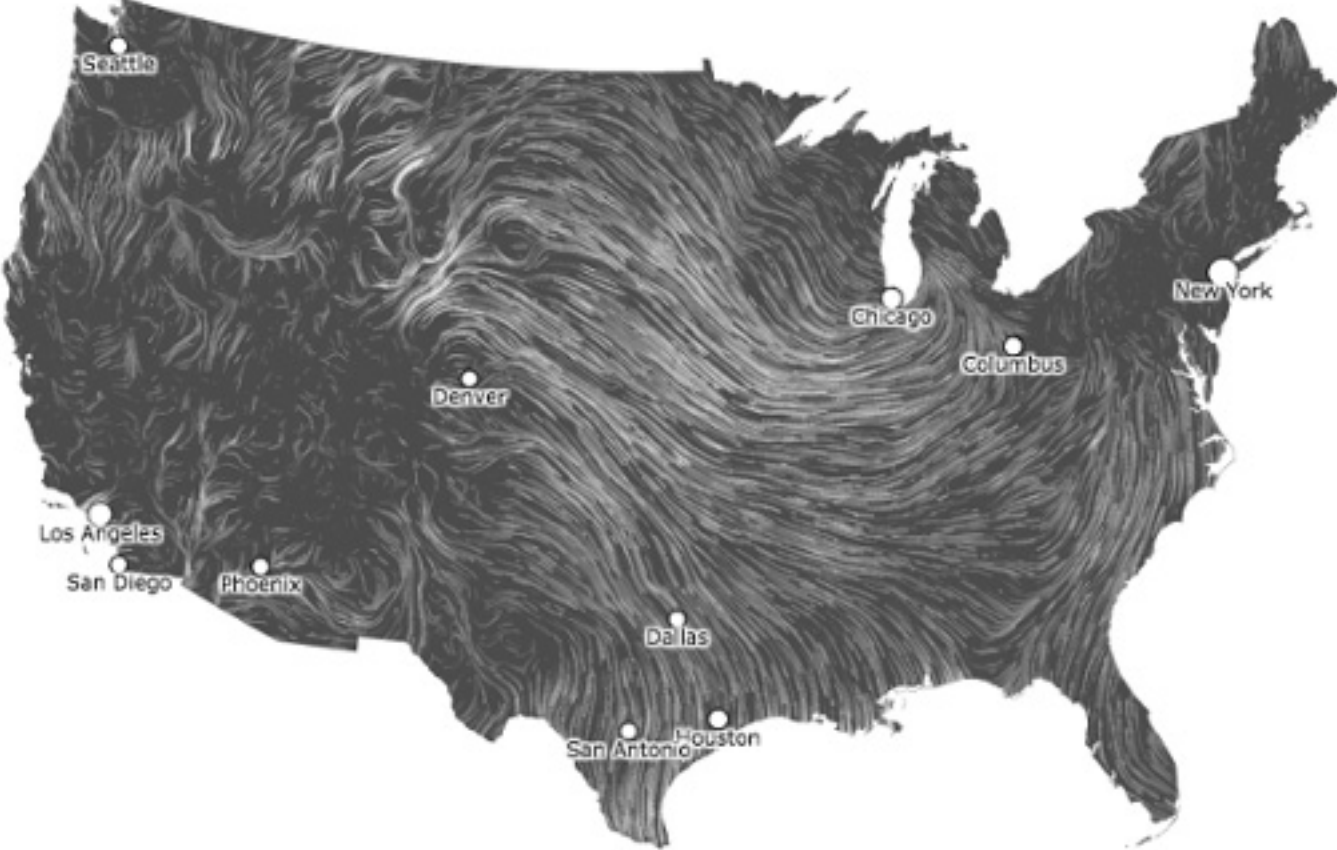
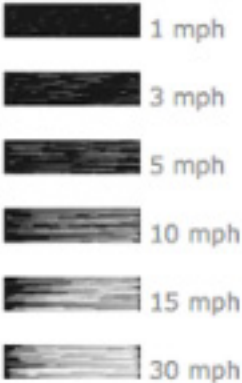
wind map

Dec. 2, 2015

10:36 am EST

(time of forecast download)

top speed: 29.1 mph
average: 8.1 mph



*When the Purpose
is Not Known Yet*

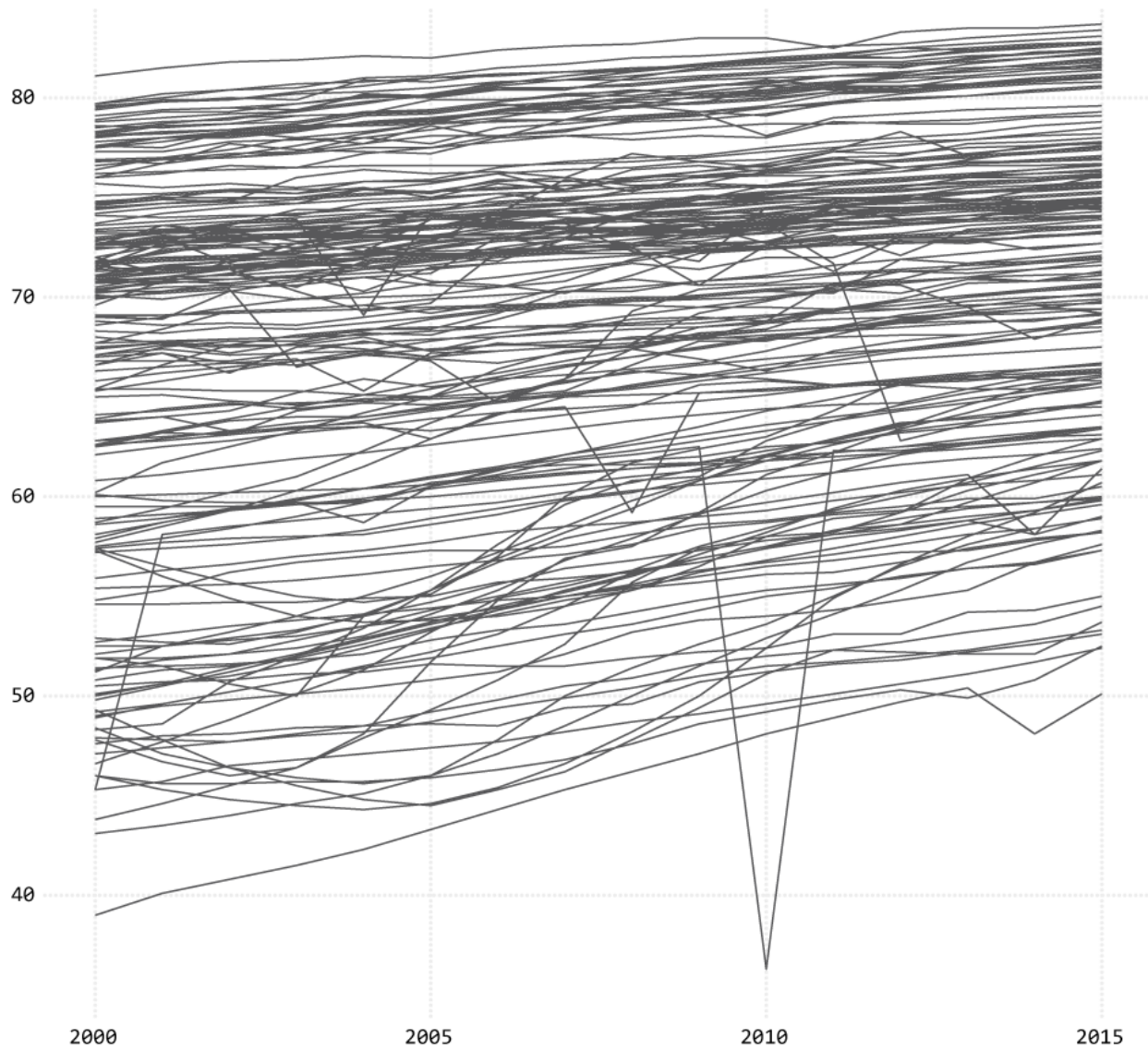
Reorganizing Data to Find Patterns

LIFE EXPECTANCY AT BIRTH, 2000-2015

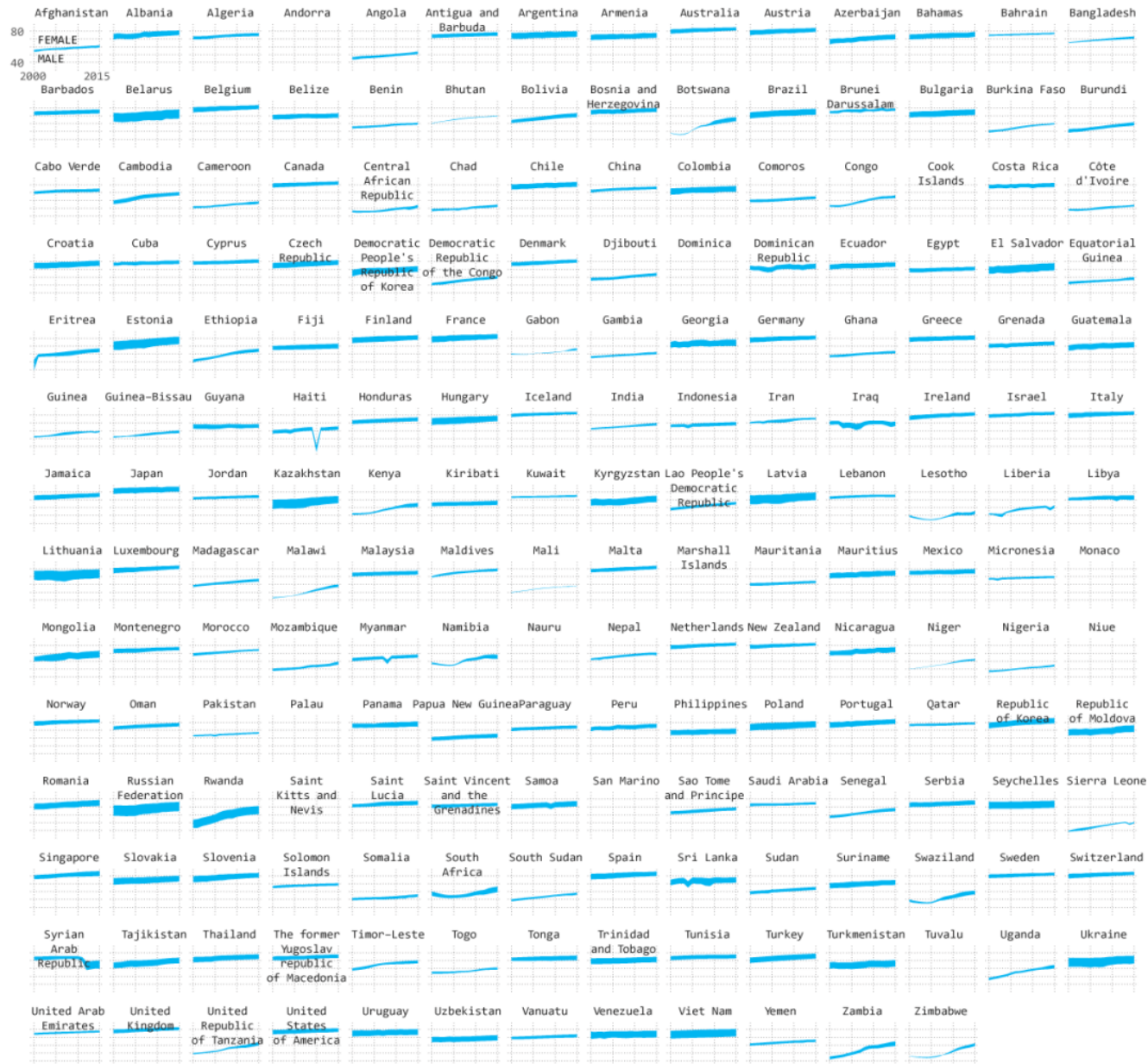


LIFE EXPECTANCY AT BIRTH, 2000-2015

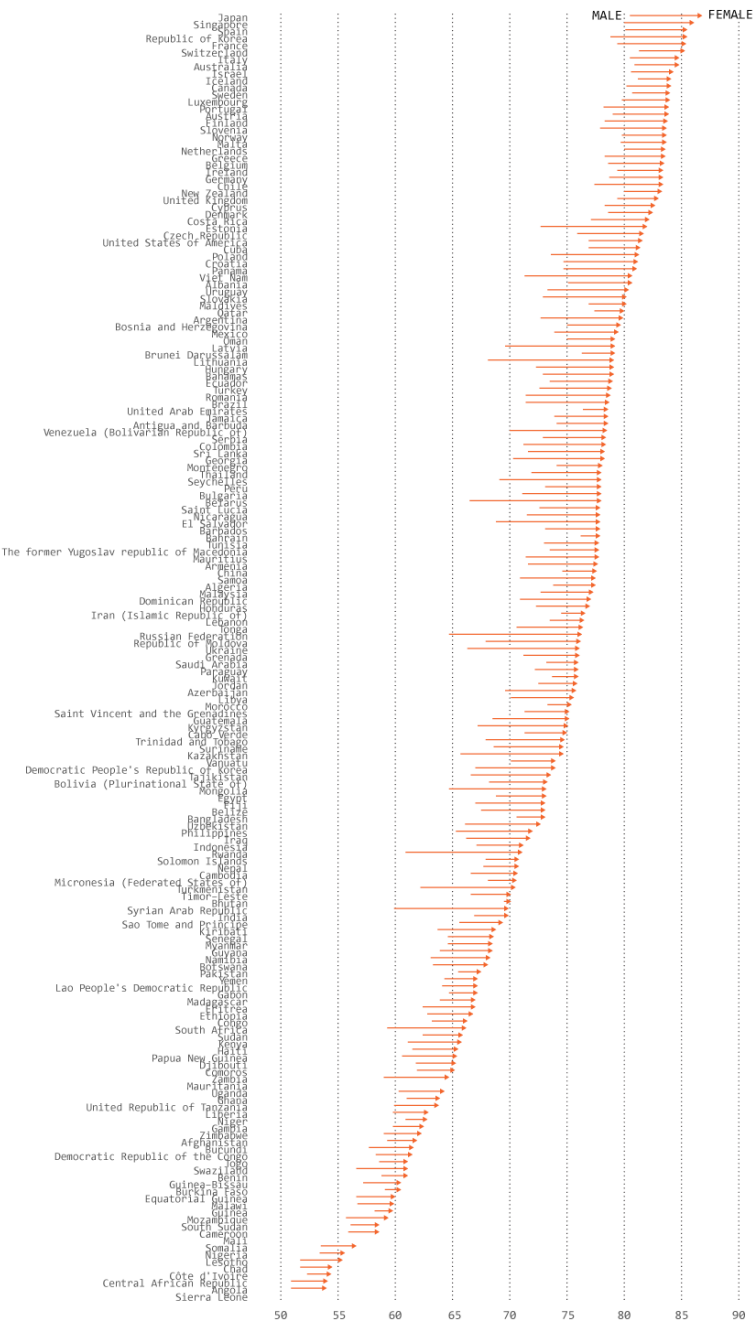
Each line represents a country.



LIFE EXPECTANCY FOR MALE AND FEMALE, 2000-2015

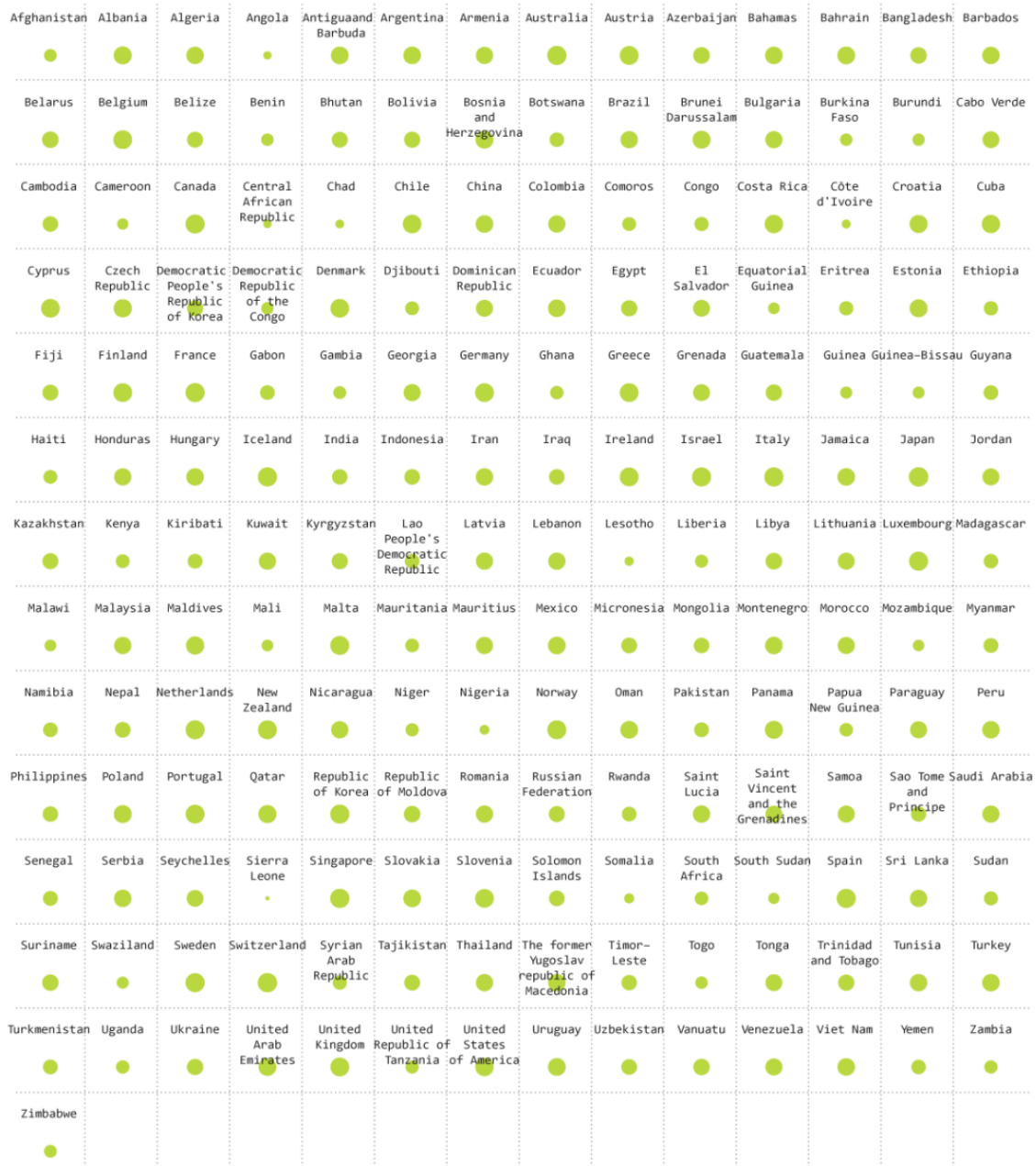


LIFE EXPECTANCY AT BIRTH FOR MALES AND FEMALES, 2015



LIFE EXPECTANCY AT BIRTH IN 2015

● 60 ● 70 ● 80 years



Communication Strategy & Storytelling

Creating a narrative

Storyboards

Summarize Visually

Contextualise

Engage, get attention

Give details

Make it accessible, interesting

Invent new ways of representing information

Come back to the intended message and evaluate

REFERENCES

Jorge Frascara - Communication Design: Principles, Methods and Practice, 2004

Stephen Few - Data Visualization for Human Perception, Interaction Design Foundation

Infoactive - DATA + DESIGN, <https://infoactive.co/data-design>