Anatomy of an AI system

An anatomical case study of the Amazon echo as a artificial intelligence system made of human labor

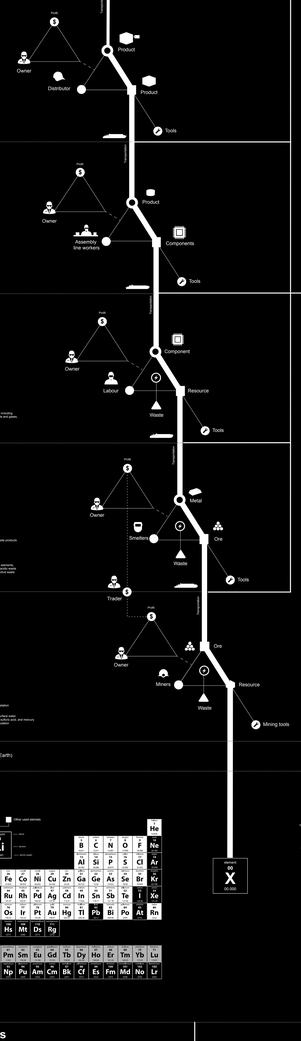
Marx's dialectic of subject and object in economy

Fractal chains of production and exploitation

Income distribution

Occupations

Distributors



Assemblers

Issues

Low paid labour
Illegal working hours
Unfair compensation for unscheduled overtime
Health and Safety issues
Lack of Freedom of Association
Migrant workers rights
Working conditions
Increased profits for owners
Workers health care programs

Hazards

Working

Injurious working conditions
Repetitive tasks
Hazardous chemical exposure
Exposure to lead and toxic substances
Hazardous working conditions and unsanitary practices
Illegal employment of very young workers
Long hours of work, no breaks, no days off, shift work, and job stress

Component manufacturers

Issues

Toxic waste
Health hazards

Hazards

Working

Use of toxic materials such as arsenic, phosphorus, and benzene without adequate health hazard control measures causes chronic neurological and GI tract ailments

Inhalation of dust and respiratory organs

Neurotoxins

Low-frequency electromagnetic radiation and radiofrequency radiation

Ergonomic hazards, long positions, repetitive work, shift work, and job stress

Environmental

Use of hazardous chemicals including carcinogenic and toxic metals and gases, and volatile solvents

Groundwater pollution
Air pollution
Toxic waste

Smelters & Refiners

Issues

Acidic and Radioactive waste
Health and environmental hazards

Hazards

Working

Use of toxic materials such as arsenic, phosphorus, and benzene without adequate health hazard control measures causes chronic neurological and GI tract ailments

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Environmental

Large proportion of the harmful waste products from metal refinery

Groundwater pollution
Air pollution
Toxic waste

Shifting rare earth elements
after refining one ton of rare earth materials, approximately 75 tons of acid, 9 tons of caustic soda, and about a ton of hazardous waste residual are produced

Mines

Issues

Hard labour
Forced labour
Child labour
Low paid labour
Conflict minerals
Environmental and working hazards

Hazards

Working

Accidents
Injuries
Injury to eyes
Fall injuries
Dust exposure
Respiratory ailments
Musculoskeletal injuries
Fatigue

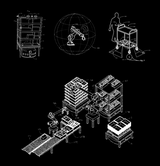
Health risks
Noise
Vibration
Heavy lifting
Repetitive motion
Heavy loads
Hazardous work

Environmental

Erosion
Formation of sinkholes
Loss of biodiversity
Depletion of water, and poisoning vegetation
Soil contamination
Acidic water leakage
Contamination of ground and surface water
Release of heavy metals such as lead, and mercury
Release of toxic and radioactive substances
Air pollution and dust pollution
Deforestation

Privatization and exploitation of common resource (Earth)

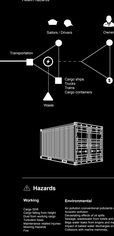
Amazon storage systems



Transportation

Issues

Air and water pollution
Toxic waste
Health hazards



Hazards

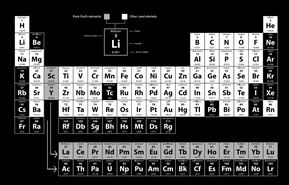
Working

Cargo ship
Long working hours (wage)
Fatigue, stress, and boredom
Turbulent Seas
Pirate attacks and armed robbery
Working injuries

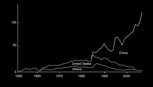
Environmental

Air pollution (conventional pollutants and greenhouse gases)
Noise
Accidental discharge of oil or gas
Sewage, wastewater from toilets and kitchen facilities
Release of toxic and hazardous substances
Transport of invasive species and other biological contaminants
Collisions with marine mammals

Elements



Rare Earth Elements (REE) exploitation

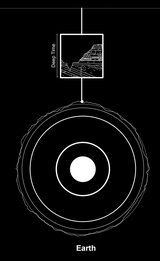


Since 1980, mining companies have produced four times the amount of many, if not all, rare metals compared to the amount they produced from the beginning of time until 1980.

On average, a 21st century citizen uses ten times more metals than one of the 20th century.

In a single minute there is about 70 minerals - two-thirds of the periodic table.

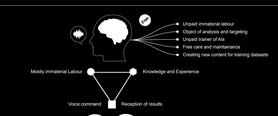
Geological process



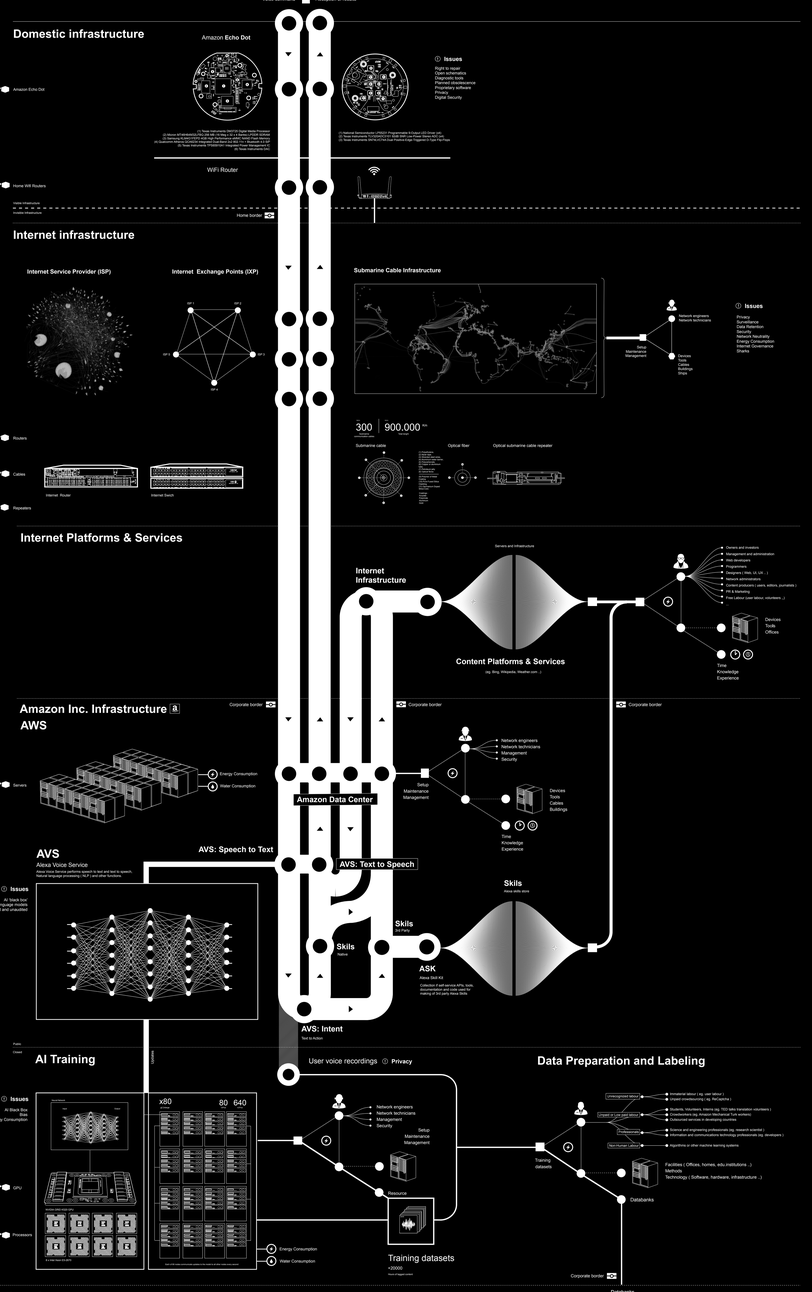
Human operator

Issues

Privacy
Digital security
Unpaid immaterial labour

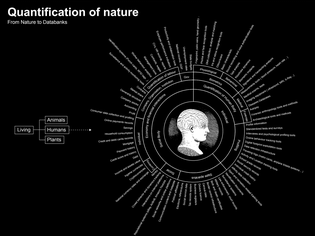


Domestic infrastructure



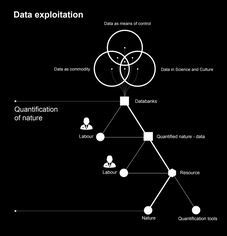
Quantification of nature

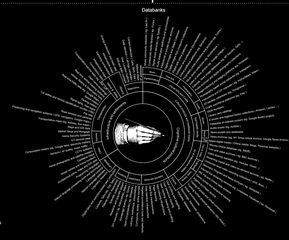
From Nature to Databanks



Quantification of human body, actions and behaviour

Data exploitation

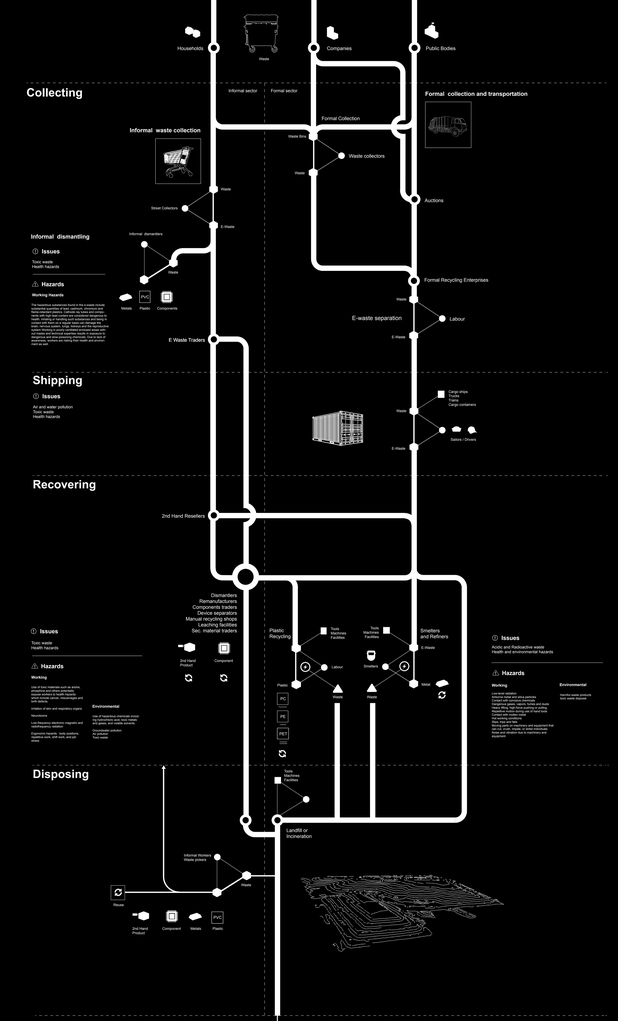




Quantification of human-made products

Abandoned devices

Collecting



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Health hazards

Hazards

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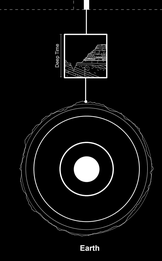
Injuries and illnesses are regulated but are underreported because workers are afraid of being fired or intimidated by managers and supervisors

Environmental

Inactive waste products
Toxic waste disposal

Geological process



Vladan Joler and Kate Crawford (2018)