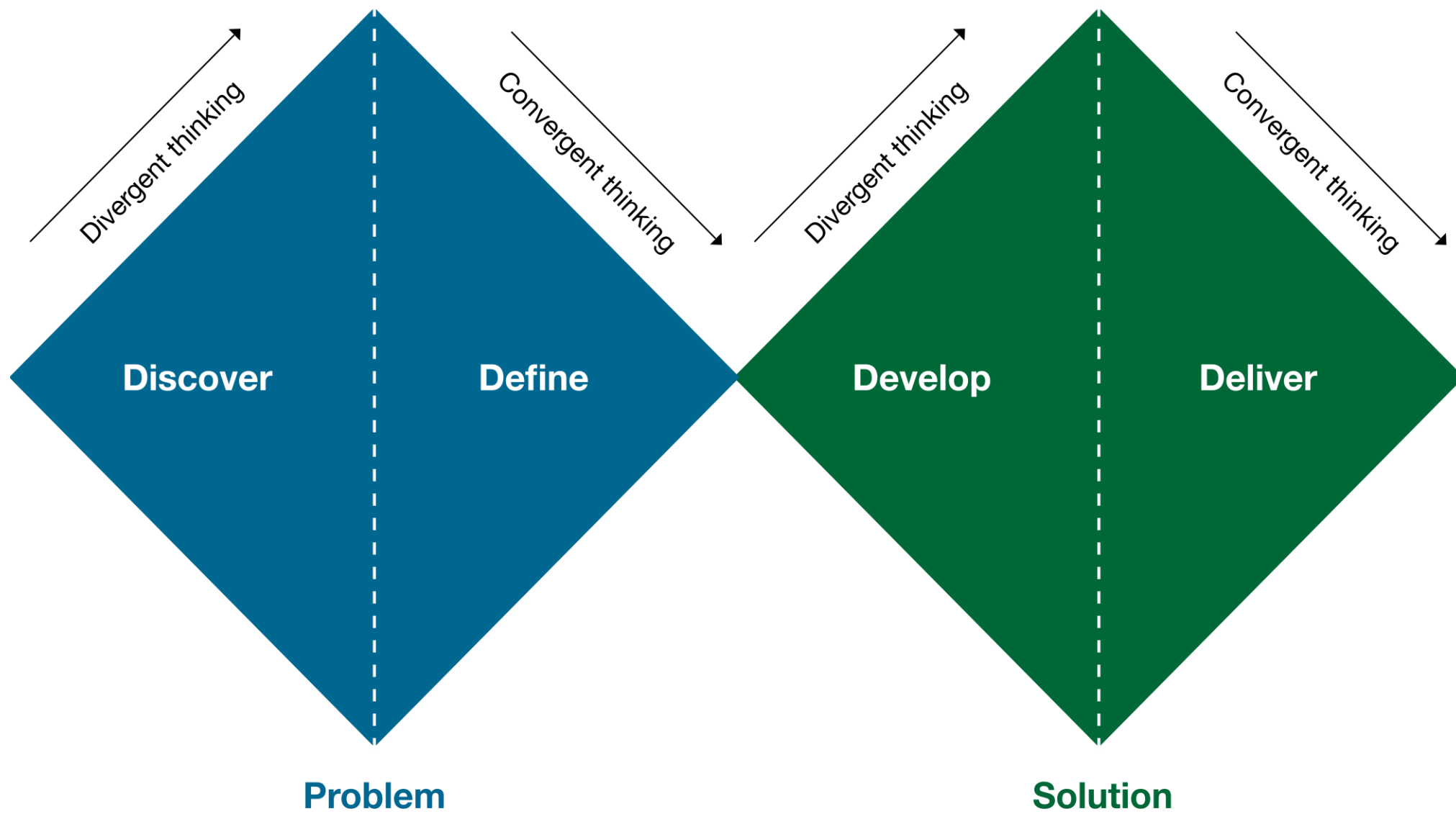


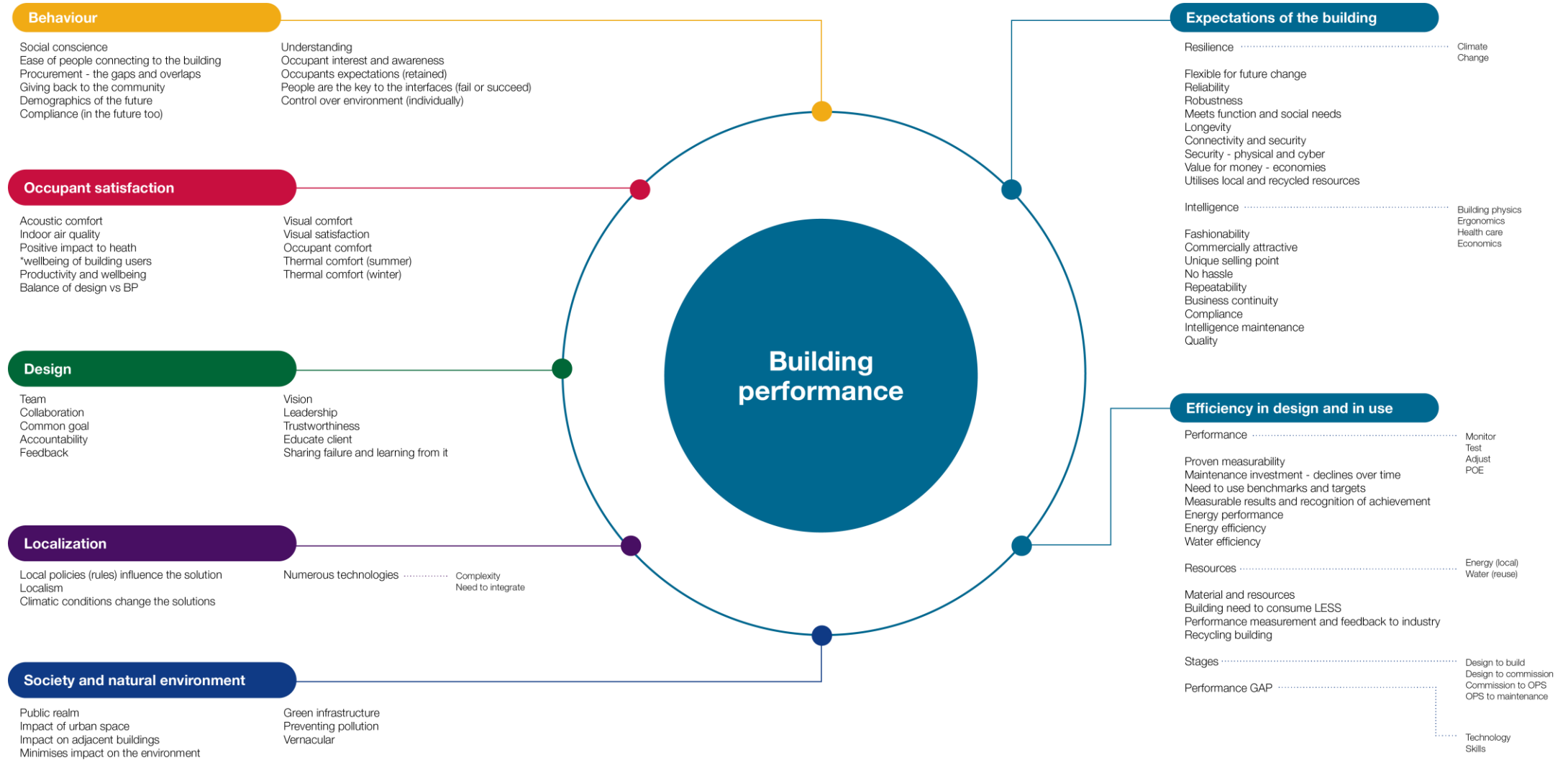


Building Performance Reimagined

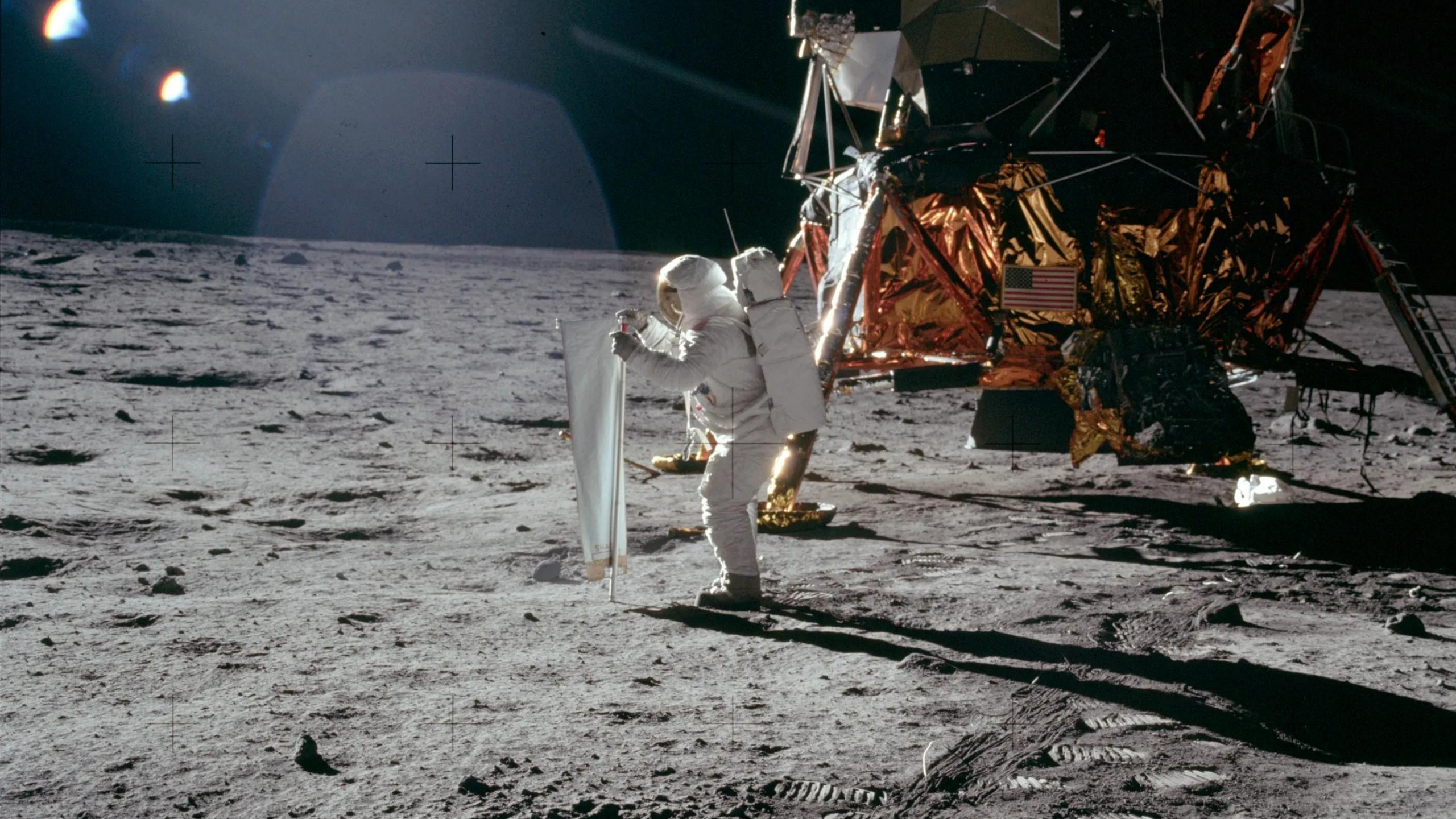
Fiona Cousins – Stellar

ANZ July 29 2025











17:17

67%

Will AI replace programmers



will ai **replace** programmers



will ai **replace** artists



Will AI re



will ai **replace** developers



will ai **replace** programmers

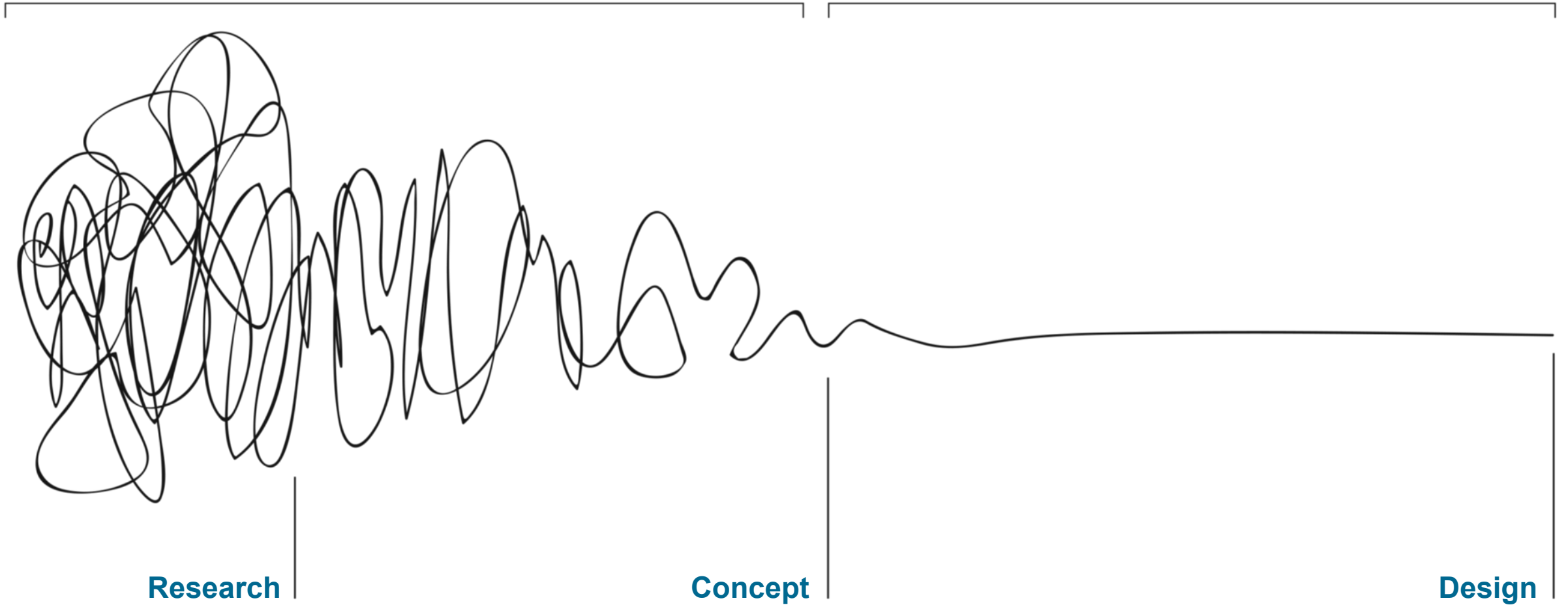


will ai **replace** engineers



Uncertainty / Patterns / Insights

Clarity / Focus



Night-time lighting study

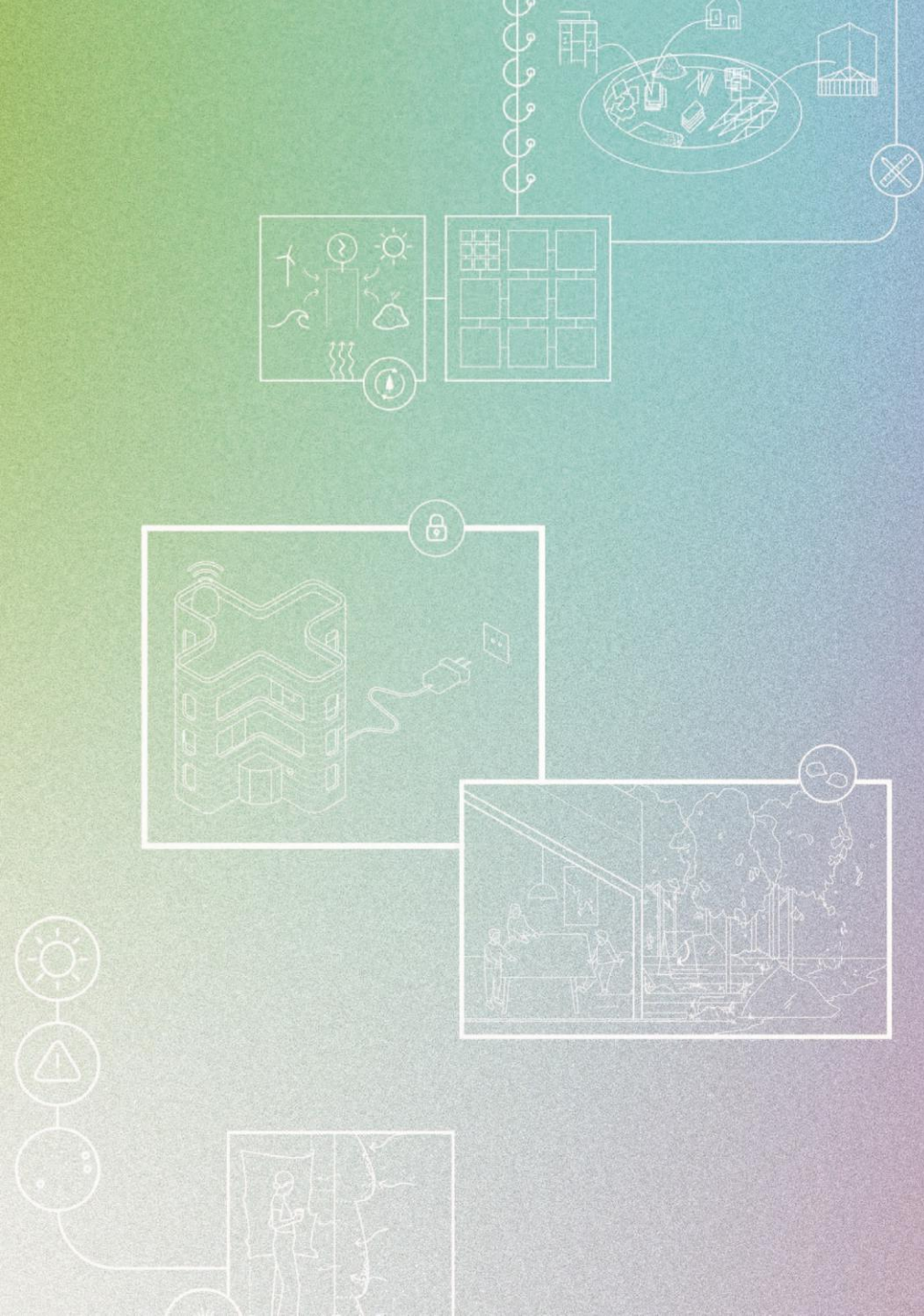


Night-time lighting study





Night-time lighting study



Social change

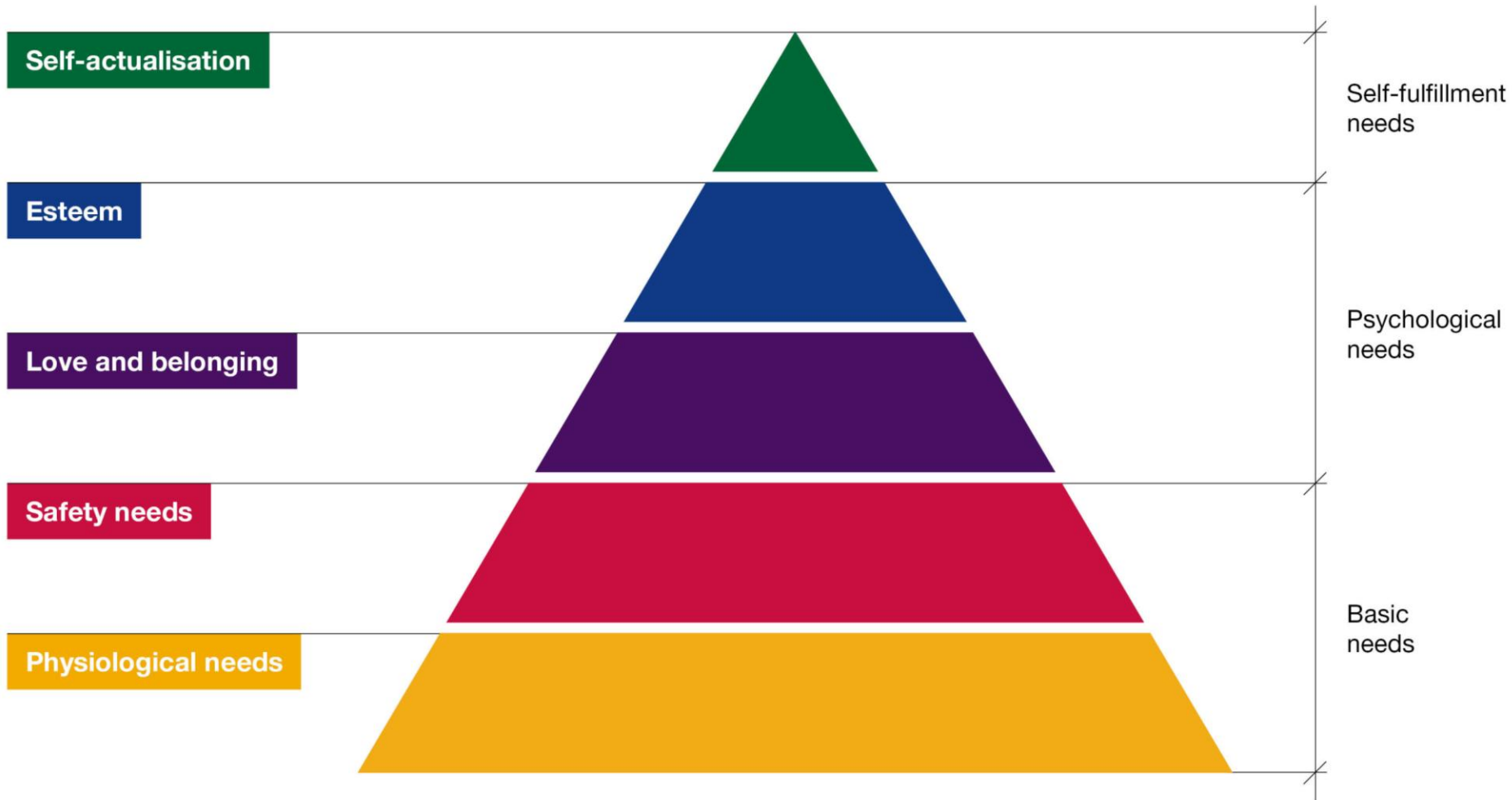
Technological change

Economic change

Environmental change

Politico-legal & regulatory change

Maslow's hierarchy of needs



VARIETY



CONNECTEDNESS



READINESS



EMERGENCE



VARIETY



OPTIMISED, ADAPTABLE SPACES

DESIGNED TO BE MODULAR, ADAPTABLE, DECONSTRUCTABLE, MULTI-FUNCTIONAL AND USED THROUGHOUT A 24/7, 7 DAYS A WEEK CYCLE AND IN DIFFERENT CONDITIONS. EXISTING BUILDINGS ARE UPDATED AND RETROFITTED TO ENABLE FUTURE ADAPTION.



BIOPHILIC BUILDINGS

SPACES THAT SERVE A MULTITUDE OF SPECIES, FROM THE MICROSCOPIC TO MIGRATING SPECIES - ENCOURAGING A VARIETY OF LIFE, LEVERAGING NATURE SERVICES. NATURE-BASED SOLUTIONS AND BIOMATERIALS. THESE SPACES MAY EVEN PROMOTE INDOOR MICROBE POPULATIONS THAT DON'T HARBOUR HARMFUL PATHOGENS.



LEGIBLE, PERSONAL PLACES

COMPLETELY PERSONALISED AND ADAPTABLE TO SUIT THE REQUIREMENTS OF USERS AT DIFFERENT TIMES, FEATURING ACCESSIBLE PERFORMANCE DATA AND INTUITIVE USER GUIDANCE THAT YOU DO NOT NEED TECHNICAL EXPERTISE TO 'READ'.

BEYOND THIS POINT

Bicycles and electric vehicles only

RESPONSIVE SENSING SYSTEMS MAKE REAL-TIME RECOMMENDATIONS FOR MANAGING AND RECONFIGURING SPACE

INTERFACES ARE EASY-TO-READ FOR ALL USERS



PERSONAL MICRO-ENVIRONMENTS THAT REDUCE THE NEED TO HEAT / COOL A WHOLE SPACE



MORE-THAN-HUMAN HABITATS TO IMPROVE BIODIVERSITY - NESTING BOXES, BAT ROOSTS, INSECT HOTELS

Bacterial level rating... B+

Plant species tracker... new species detected!

NATURE-BASED SOLUTIONS FOR HEATING, COOLING, CLEANING

REED BEDS AND MINERAL FILTERS FOR WATER PURIFICATION

SOUND ATTENUATION MATERIALS: COTTON, WOOD FIBRES, BAMBOO GARDENS

NATURAL CLAYS, MYCELIUM AND NATURAL FIBRE TEXTILES

BIOMATERIALS, PROBIOTIC COATINGS, PRECISION FERMENTED AND CULTURED MATERIALS

SENSING SYSTEMS AND HVAC MICROBIOME FILTERS THAT MAINTAIN MICROBIAL BALANCE

NATURAL SELF-CLEANING MATERIALS TO REDUCE THE NEED FOR TOXIC CHEMICALS - LOTUS LEAVES, CLAYS, EXPOSURE TO DIRECT SUNLIGHT

BIOPHILIC AIR FILTRATION

HUMAN-SCALE ADAPTABILITY: OPENINGS, SHADES, VENTS, SOUND AND LIGHT BARRIERS OR AMPLIFIERS

MODULAR, DEMOUNTABLE AND DECONSTRUCTABLE ELEMENTS

'REWILDED' ZONES WHERE DIVERSITY FLOURISHES

MOVEABLE WALLS, JOINERY, SERVICES AND CEILINGS, 'ANYWHERE' PLUG IN POINTS FOR WATER AND POWER

SERVICES FLEX (EXPAND / CONTRACT) TO DIFFERENT USER NEEDS

'LIGHT', 'COMFORT', 'HYGIENE' SUPPLIED AS SERVICE THROUGHOUT BUILDING'S LIFE

24/7 AND 7 DAY A WEEK USAGE POTENTIAL AND OPTIONS

DYNAMIC SCHEDULING AND CO-ORDINATION PLATFORMS FOR OWNERS, TENANTS, MANAGERS, USERS

CASE STUDY

1

2

3

SIGNIFY'S LIGHTING AS A SERVICE (LAAS)

CASE STUDY

2

3

INGENHOVEN ARCHITECT'S INFLATABLE ARCHITECTURE

PLACE MODULAR BUILDING, LONDON

CASE STUDY

3

MICROBIOLOGY BREAKTHROUGHS: PREBIOTICS, POSTBIOTICS AND PARABIOTICS

[SEE APPENDIX FOR CASE STUDY INFO]





READINESS



PHYSICAL REFUGES

DESIGNED TO BE HAVENS, WORKING IN COORDINATION WITH THE SURROUNDING URBAN ENVIRONMENT TO UNDERSTAND FUTURE RISK AND MODEL ITS IMPACTS - TO PROTECT HEALTH AND PREVENT DAMAGE.



DIGITALLY SECURE

PLACES WITH THE ABILITY TO SECURELY COLLECT, PROCESS, AND STORE MASSES OF DATA ON USERS, INFRASTRUCTURE AND THE WIDER URBAN SYSTEM WITHOUT COMPROMISING ON DATA QUALITY, SECURITY OR SENSE OF PRIVACY - WHETHER THE PHYSICAL DATA STORAGE IS ON-SITE OR VIA EVER MORE SOPHISTICATED CLOUD SOLUTIONS.



INVISIBLE RISK MANAGERS

BUILDINGS WORKING AS 'LIVE' IMMUNE SYSTEMS, ABLE TO MONITOR, ANTICIPATE, DETECT, AND EFFECTIVELY COMBAT UNSEEN THREATS TO USERS AND COMMUNITIES, ENSURING THEY DO NOT IMPACT PHYSICAL AND MENTAL HEALTH.



ON-SITE AND REMOTE DIGITAL SECURITY SPECIALISTS

REDUCTION OF SURVEILLANCE IN AND AROUND BUILDINGS AS A MEASURE OF SUCCESS

DYNAMIC FACADES RESPOND TO CONDITIONS: CHANGING COLOUR OR FORM - TURNING ENERGY CAPTURE ON/OFF



COMMUNITY AND AREA KNOWLEDGE SHARING, ANTICIPATION AND WARNING SYSTEMS

CONSERVATION AND STORAGE OF WATER: GREYWATER RECYCLING, STORMWATER ATTENUATION, RAINWATER COLLECTION, STORM WATER DETENTION VAULTS

PATHOGEN SENSING AND CONTAMINATION DETECTION: HVAC SYSTEMS, PCR SURFACE TESTING, WASTEWATER SCANNING

HIGH EFFICIENCY FILTRATION DEVICES - FOR CLEAN WATER, CLEAN AIR, CLEAN SOIL

'AMPHIBIOUS' STRUCTURES WITH INFLATABLE AND FLOATING ELEMENTS

ENERGY SECURE SITES: BATTERY ENERGY STORAGE SYSTEMS, MODULAR NUCLEAR AND HYDROGEN

'WALLED GARDENS': SECURE COMMUNITY- OR CITY-SCALE INTERNET

'WALLED GARDENS': SECURE COMMUNITY- OR CITY-SCALE INTERNET

NATURAL BARRIERS SUCH AS RAIN GARDENS, TREE PLANTING, SUDS

PROTECTION AT THE URBAN-WILD INTERFACE: MULTI-SPECIES REFUGE IN EXTREME CONDITIONS

LIVE GUIDANCE EQUIPS EVERY OCCUPANT TO ADJUST PROTECTION LEVELS

SYSTEMS CAN EXPAND TO SERVICE SUDDEN INCREASES IN OCCUPANT LEVELS



STORM RESISTANT WINDOWS, DOORWAYS AND LOW-TECH FLOOD BARRIERS AND APPENDAGES

CRITICAL INFRASTRUCTURE IS MOVEABLE WHEN SITE IS COMPROMISED

A.I. SOFTWARE MODELS NEW TYPES OF MATERIAL: INSULATION

ADVANCED FIRE-RETARDANT MATERIALS AND ANTI-SMOKE FILTRATION

RADIATION-BLOCKING MATERIALS: WATER, LEAD, CONCRETE

ELECTROMAGNETIC SHIELDING SYSTEMS

NEIGHBOURHOOD 'SAFE ZONES' IN DESIGNATED BUILDINGS

CASE STUDY

ROTTERDAM'S 'FLOATING OFFICE'

COMMUNITY RESILIENCE HUBS

CASE STUDY

SINGAPORE LAND AUTHORITY'S DIGITAL TWIN

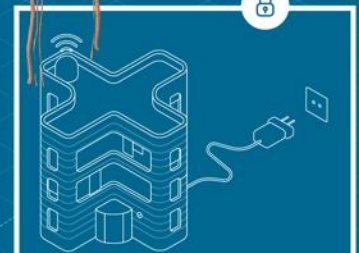
CASE STUDY

PHOTOCATALYTIC OXIDATION IN HVAC SYSTEMS

[SEE APPENDIX FOR CASE STUDY INFO]



DISTRIBUTED CLOUD & DIGITAL INFRASTRUCTURE TO REDUCE DEPENDENCIES ON MEGA-SCALE DATA CENTRES (SINGLE POINTS OF FAILURE)



DELIBERATELY DISCONNECTED OR DISCONNECTABLE ZONES



© Ethan Rohlf Photography



© Tim Griffith

CONNECTEDNESS



NETWORKED WITH WIDER SYSTEMS

PART OF AN INTERCONNECTED URBAN SYSTEM THAT COMMUNICATES AND COORDINATES ITS APPROACH TO UTILITIES AND RESOURCES (DATA, WATER, ENERGY, WASTE ETC), FOR ACTIVE SUPPLY AND DEMAND MANAGEMENT.



ROOTED IN CONTEXT

INFORMING AND INFORMED BY SURROUNDING CULTURE AND CONTEXT, BENEFITTING FROM THE LOCAL TOPOGRAPHY (SLOPES, WATER, SUNLIGHT), ECONOMY (BUSINESSES, SKILLS, TRADITIONAL/VERNACULAR PRACTICES), AND MATERIALS.



CREATING CONNECTIONS

ACTIVELY IMPROVING SOCIAL RELATIONSHIPS AND ENHANCING SOCIAL VALUE FOR USERS, THE LOCAL COMMUNITY, AND THE BROADER SOCIETY - AS WELL AS ENHANCING INTERSPECIES CONNECTIONS.

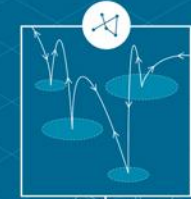
COMMUNITY ENGAGEMENT, CONSULTATION, DESIGN AND RESEARCH HUBS IN-BUILT



COMMUNITY NETWORKS AS A SUCCESS METRIC: NUMBER (AND STRENGTH) OF RELATIONSHIPS



LOCALISING SUPPLY CHAINS TO FOSTER LOCAL ECONOMY AND SKILL BUILDING



CITIES, COMMUNITIES AND REGIONS AS DAOs (DISTRIBUTED AUTONOMOUS ORGANISATIONS) WHICH COORDINATE, MONITOR, DOCUMENT, COMMUNICATE AND PLAN TOGETHER

INTEROPERABLE COMMUNICATION INFRASTRUCTURE (BETWEEN DIFFERENT BUILDING TYPES AND WITHIN NEIGHBOURHOODS)

INTEGRATED MOBILITY SOLUTIONS, PEDESTRIAN INFRASTRUCTURE AND SIGNPOSTING BETWEEN BUILDINGS: PROMOTING ACTIVE TRAVEL IN LOCAL AREAS



DESIGN FOR BREAKING DOWN CULTURAL OR INTERGENERATIONAL DIVIDES



COGNITION AND MENTAL WELLBEING PERFORMANCE METRICS

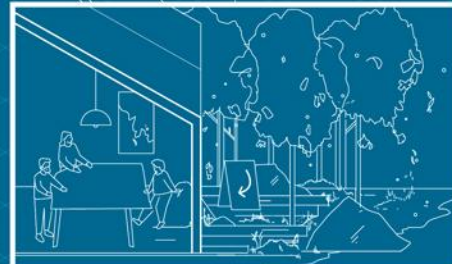
LOCAL ENGAGEMENT CORE TO FACILITIES MANAGEMENT

LOCAL BUSINESSES, SKILLS AND INFORMATION HANDBOOKS FOR NEIGHBOURING BUILDINGS



CO-EFFICIENCIES: PAIRING FEATURES THAT CAN EXCHANGE ENERGY IN A SYSTEM - E.G. HEAT FROM DATA CENTRES OR COMPUTE

COMMUNITY OWNERSHIP MODELS AND FRAMEWORKS FOR RESPONSIBILITY & MAINTENANCE



EXTERNAL AND INTERNAL LAYOUT DESIGN PROMOTES SOCIALISING AND INCLUSION

SEEING LOCATION AS AN ASSET: CAPTURING POWER FROM WIND, TIDES AND RUNNING WATER, SOLAR ORIENTATION AND URBAN HEAT EFFECTS

LOCAL BUSINESSES, MAKERS AND ARTISANS SUPPLY FIT-OUT MATERIALS

CITY-SCALE GRIDS MADE UP OF SMALLER MICROGRIDS WHICH CAN FUNCTION TOGETHER OR INDEPENDENTLY

REAL-TIME DISTRICT SERVICE SYSTEMS AND INFORMATION: ENERGY, WATER, WASTE, TRAFFIC FLOWS, WEATHER



DESIGN, MASSING AND POSITIONING TO IMPROVE PASSIVE COOLING / HEATING

CASE STUDY

1

2

3

NETWORKED HEAT: BUNHILL 2 ENERGY CENTRE

DEEP GREEN DISTRIBUTION

CASE STUDY

2

3

NAKABOM HOUSE: RAMMED EARTH AND LOCAL RESOURCES

CASE STUDY

3

ALBANY MULTIGENERATIONAL CARE HOME

[SEE APPENDIX FOR CASE STUDY INFO]

Yesterday



Few large power plants



Centralized, mostly national



Based on large power lines and pipelines



Top to bottom



Passive, only paying

Production

Market

Transmission

Distribution

Consumer

Tomorrow



Many small power producers



Decentralized, ignoring boundaries



Including small-scale transmission and regional supply compensation



Both directions



Active, participating in the system

EMERGENCE



ABUNDANT AND CIRCULAR

SELF-SUSTAINING ASSETS THAT PRODUCE, CONSUME, AND FIND NEW USE FOR THE RESOURCES THAT THEY NEED TO FUNCTION.



LOCAL CONTRIBUTORS

WORKING TO ACTIVELY REGENERATE AND IMPROVE THE NATURAL ENVIRONMENTS AROUND THEM THROUGH THEIR DESIGN, OPERATION, AND FUNCTION.



HUBS FOR MAKING

SPACES THAT ARE DESIGNED TO SUPPORT AND GROW A NEW CULTURE OF MAKING AND RE-MAKING.

Making Centre

MOVEABLE FABRICATION UNITS AND MOBILE MAKERS CARTS.



SERVICES SUPPORT MAKERSPACES: VENTILATION, WASTE EXTRACTION AND REUSE

DISTRIBUTED MANUFACTURING NETWORKS BETWEEN BUILDINGS - BUILDING A KNOWS WHAT BUILDING B IS PRODUCING



PAIRING HABITATS: NEW OPPORTUNITIES FOR BIOMASS, WASTE AND THERMAL MASS

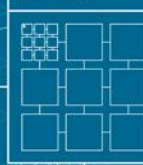


BUILDING THAT ACTS TO TAKE IN WASTE, WASTE WATER AND CLEAN IT TO MAKE IT POTABLE



DATA-DRIVEN BUILDINGS REQUIRE ALL RENEWABLE ENERGY GENERATION ON-SITE / LOCALLY

EXCESS ENERGY FED BACK INTO COMMUNITY OR CITY GRID



ENERGY STORAGE IN FACADES AND OTHER BUILDING COMPONENTS

LOCALLY-SOURCED MINERALS FOR BATTERIES REDUCE LITHIUM DEPENDENCY. SULPHUR, IRON, ZINC AND SODIUM



INTEGRATED CO-CREATION AREAS, PLACES FOR LEARNING, EDUCATION AND TRAINING

PURIFICATION AND BIOREMEDIATION BY FACADES AND VENTS



URBAN AND VERTICAL FARMING, AGRI-TECHNOLOGIES INTEGRATED INTO BUILDING SERVICES

CALORIE OR NUTRIENT YIELD CORE TO PERFORMANCE



RECYCLING AND REUSE OF MATERIALS ON SITE.



AUTONOMOUS AND ROBOTIC 'HEALING' SERVICES CONNECTED TO LOCAL MATERIAL PRINTERS



URBAN MINING: NEIGHBOURHOODS REUSE CENTRES AND MATERIAL LIBRARIES



STRUCTURES AND SERVICES PROTECT NATURAL CAPITAL AND ENERGY-ABUNDANT AREAS

CASE STUDY

1 2 3

RENEWABLES ON-SITE: THE BULLITT CENTRE AND THE EDGE

CASE STUDY

2 3

NETWORKED HEAT: BUNHILL 2 ENERGY CENTRE

DEEP GREEN DISTRIBUTION

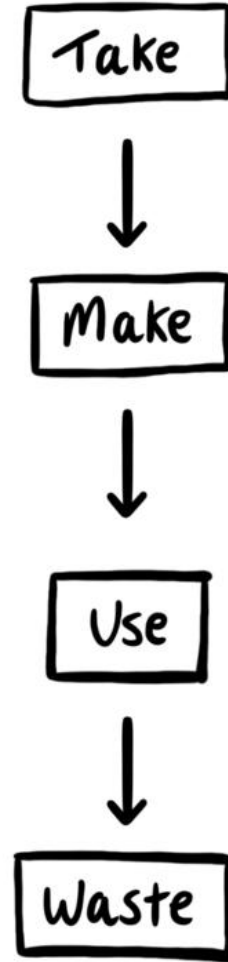
CASE STUDY

3

NON-LITHIUM BATTERY SOLUTIONS
DISTRIBUTED, DECARBONISED CHEMICAL MANUFACTURING

[SEE APPENDIX FOR CASE STUDY INFO]

Linear Economy



Circular Economy

