THE PATTERN ATLAS OF SYSTEM VULNERABILITIES

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atlas OF SYSTEM VULNERABILITIES

Using a tangle of threads as a metaphor for complex system relations, many dysfunctional patterns operate at four levels of scale.

FIBERS column

HAYWIRED
Circular, contradictory, or dead-end routines create **dysfunctional ordeals** for users, sometimes on purpose for cynical reasons.

DISCONNECTED
Seamless hand-offs between modular systems are made error-prone and disorienting.

OPAQUE
"Black box" automation misfires regularly and disguises dodgy decision-rules in way that is hard to scrutinize or trouble-shoot.

RIGGED-UP
Routines are made easier for system administrators in ways that **harm users**.

ENSNARING
Psychologically **manipulative** routines second-guess and exploit users, creating dysfunctional defensive behaviors.

CORRALLING
People are coerced or tricked into **common patterns** based on faulty premise and add risk.

IMITATION
Systems **mimick** routines that are inappropriate or beyond their capability, while blocking scrutiny.

COMPROMISED
Routines reflect **negotiations** between internal factions running system not system goals.

HOOKED
Routines are **captured** by outsiders or another system, even if overall system goals remain.

Second column

OVER-EXTENDED
Oversight attempts to "clean up" messy entanglement face **limits of capability** and cause unanticipated downstream consequences.
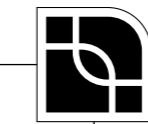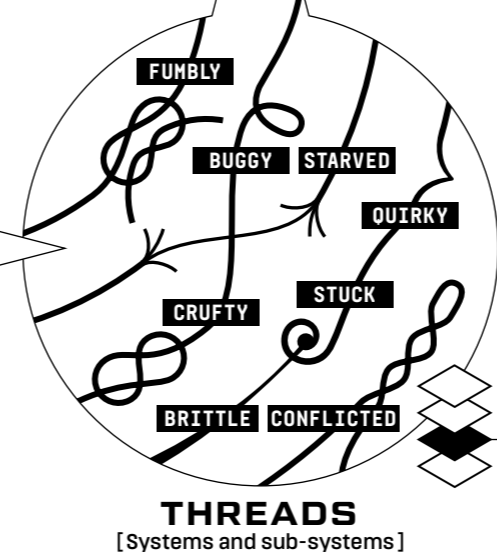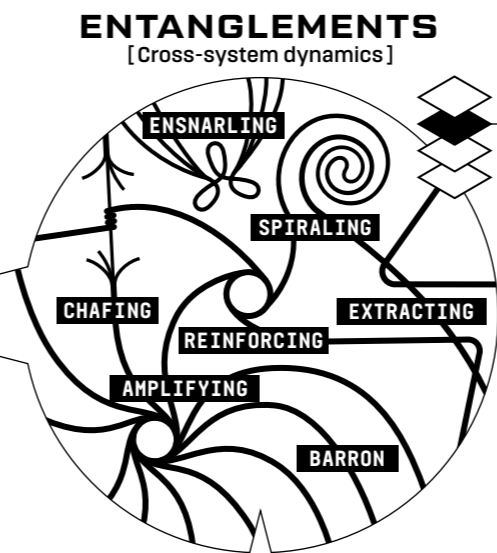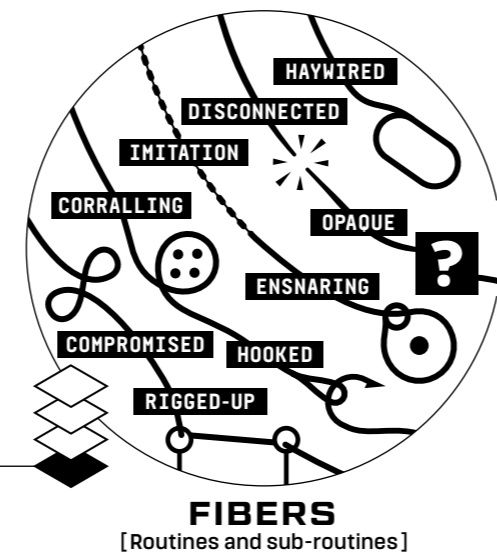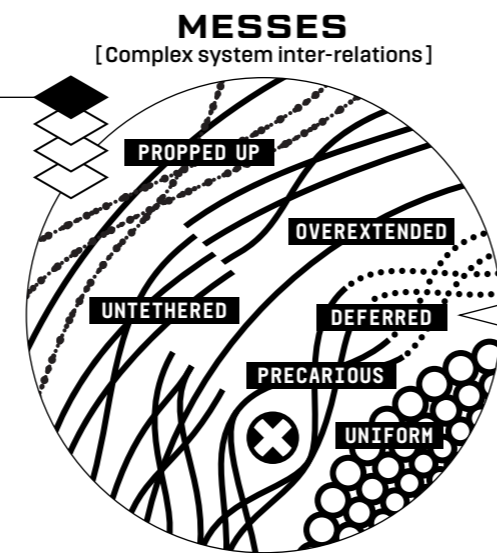
PRECARIOUS
Attempts to act as a bulwark against chaotic disorder by piling on controls will **conserve** vulnerability to occasional disaster in ways that undermine resilience.

UNIFORM
Perpetuation of best-in-class systems create **monocultures** that are easier to scale and maintain but share flaws and lack diversity necessary for resilience.

PROPPED-UP
Bailing out established, failing systems encourages reckless and cynical risk-taking while blocking more viable upstart systems from doing a better job.

DEFERRED
Instead of offsetting human bias to discount the future and act with narrow self-interest, systems **amplify these biases**, perhaps even blocking feedback about long-term dangers.

UNTETHERED
The **abstractions** used to control and make sense of systems become disconnected to the underlying reality while being trusted more readily.

MESSES
[Complex system inter-relations]

PROPPED UP
OVEREXTENDED
UNTETHERED
DEFERRED
PRECARIOUS
UNIFORM

ENTANGLEMENTS
[Cross-system dynamics]

ENSNARLING
SPIRALING
CHAFING
EXTRACTING
REINFORCING
AMPLIFYING
BARRON

FIBERS
[Routines and sub-routines]

HAYWIRED
DISCONNECTED
IMITATION
CORRALLING
OPAQUE
ENSNARING
COMPROMISED
HOOKED
RIGGED-UP

THREADS
[Systems and sub-systems]

FUMBLY
BUGGY STARVED
QUIRKY
CRUFTY STUCK
BRITTLE CONFLICTED

Right columns

REINFORCING
System dynamics **lock-in** an unsustainable or harmful pattern of activity, making divergence costly.

SPIRALING
A **vicious spiral** whereby system dynamics lead to a troublesome predicament, giving rise to new dynamics causing more trouble, and so on until collapse happens.
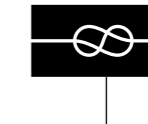
AMPLIFYING
An accelerating spiral caused by compounding effects, positive reinforcement, or correlated risks, with fall-backs ill suited to contain the *run-away* dynamics.

EXTRACTING
Concentrated ownership of a single platform creates single point of failure and sapps other systems of innovation potential by drawing exploitative **rents**.

BARRON
Edge effects between diverse, intermingling actors create positive spin-offs, yet too many advantage certain actors and too few block spin-offs.

ENSNARLING
Systems undermine each other, either through burdensome regulatory **red-tape** or by overloading shared infrastructure.

CHAFING
One system exploits another by **parasitically rigging** the relational dynamics.

CRUFTY
Cruftiness refers to departures from sound design principles, turning systems into a hodgepodge of interacting parts and kludgy arrangements.

QUIRKY
Quirkiness refers to systems with well functioning parts that occasionally interact in unanticipated ways ("normal accidents") to create cascading errors.

BUGGY
Bugginess refers to faults and flaws that make a system unreliable and vulnerable to the occasional catastrophe.

FUMBLY
Fumbliness refers to highly fragmented systems that lose coherence, show their seams awkwardly, and botch hand-offs between modules.

STUCK
Stuck systems occur when lock-in arrangements, path dependence, or dynamic traps throw up obstacles to ongoing change.

STARVED
Starved systems operate at the edge of breakdown because they lack adequate resources and neglect long-term risks.

BRITTLE
Brittle systems are too exacting to handle anomalies and lack the fault tolerance to recover from errors gracefully.

CONFLICTED
Conflicted systems have internal goal conflicts that are handled inconsistently or largely ignored.