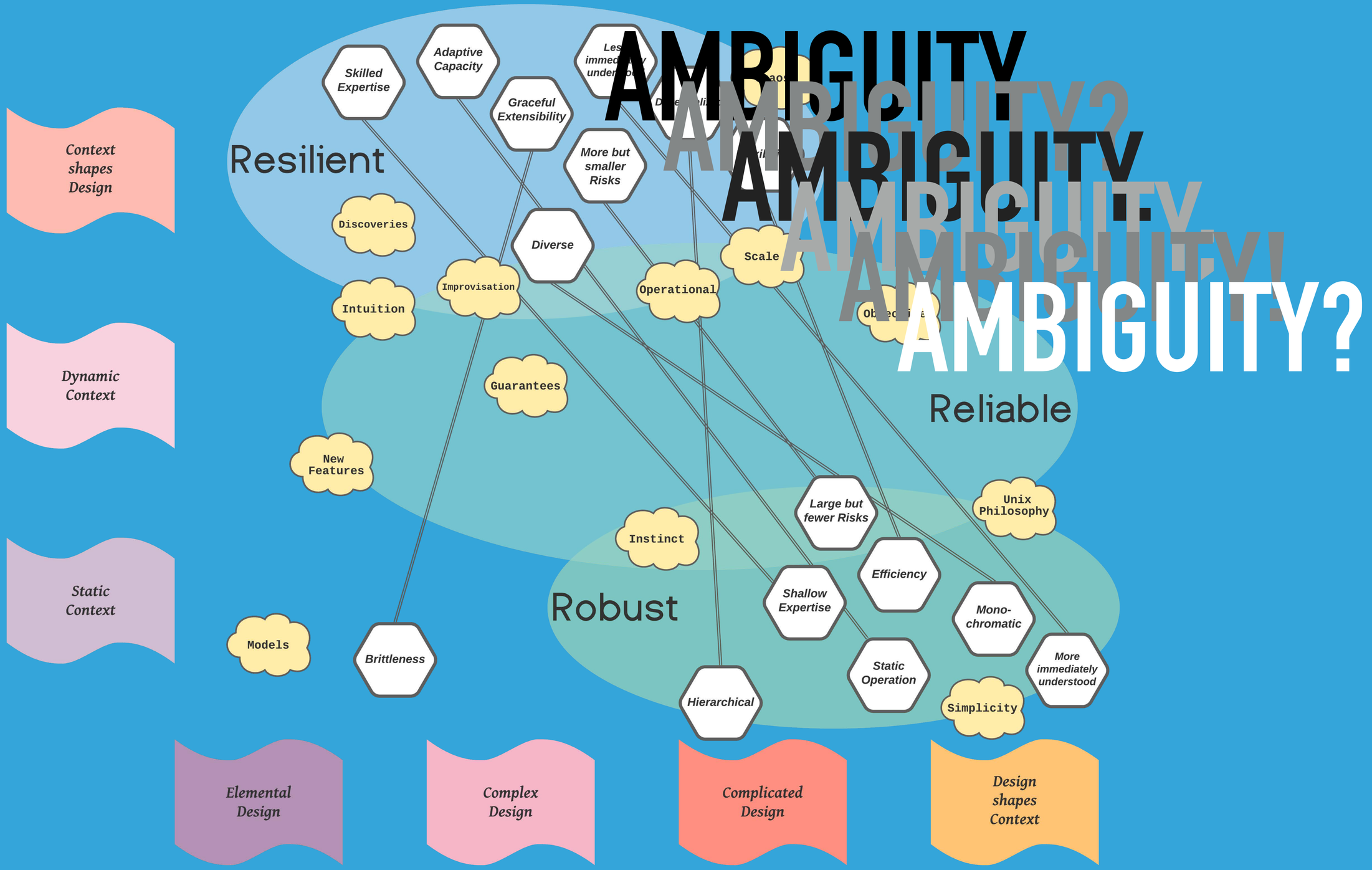
matt davis
sr infra.eng
blameless

THE ROBUST, THE RELIABLE, THE RESILIENT

GROOVE WITH AMBIGUITY


AMBIGUITY
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AMBIGUITY?
Resilient
Reliable
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Skilled Expertise
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More but smaller Risks
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Models
Brittleness
Static Operation
More immediately understood
Hierarchical
Simplicity
Context shapes Design
Dynamic Context
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Elemental Design
Complex Design
Complicated Design
Design shapes Context

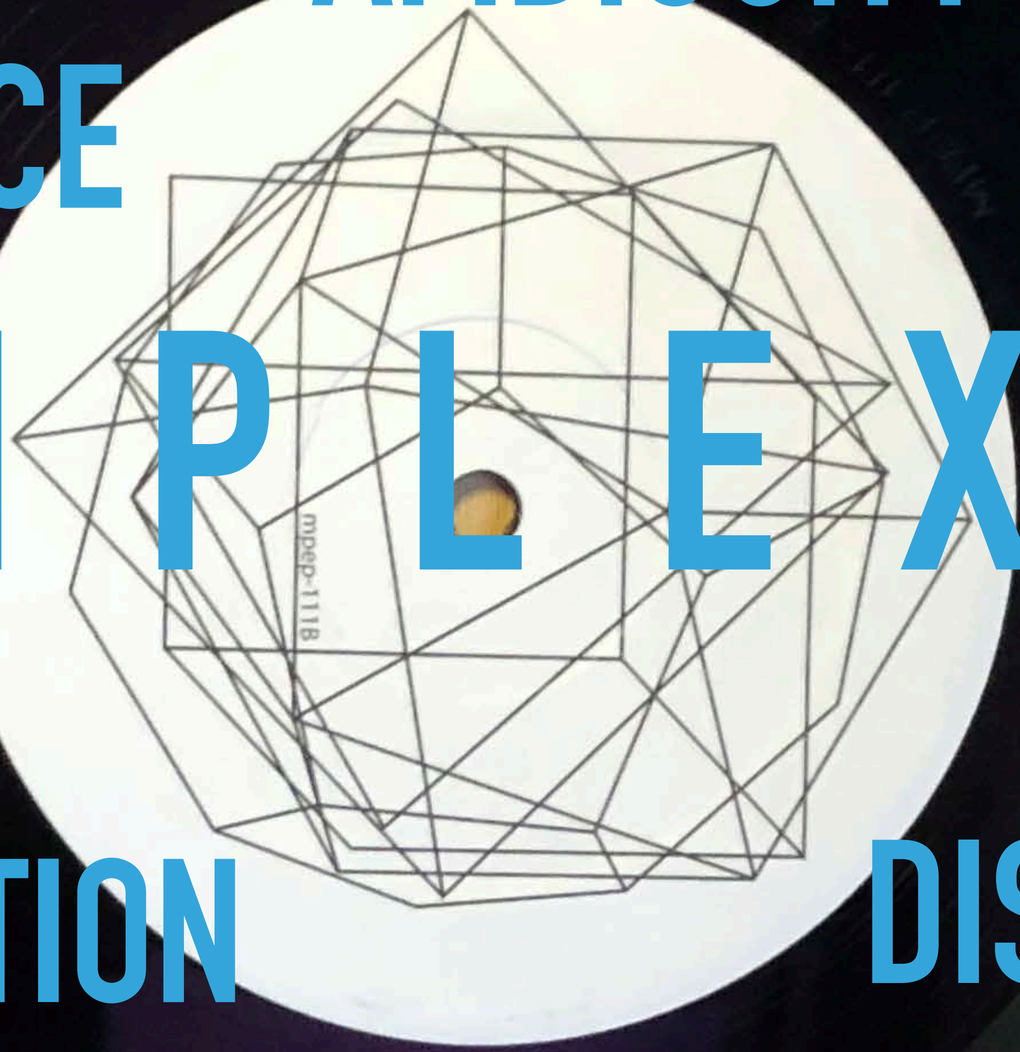
AMBIGUITY

EMERGENCE

C O M P L E X I T Y

ADAPTATION

DISCOVERY



DIVERSE, INTERDEPENDENT, NETWORKED ENTITIES THAT CAN ADAPT.

Diversity and Complexity (Scott Page)

ROBUST

TO FAILURE

1857 sound waves can be recorded as ***images on paper***

LÉON SCOTT :: PHONAUTOGRAPH

1877 record & play on cylinders of ***foil & wax***

THOMAS EDISON :: PHONOGRAPH

1895 78rpm standardizes on ***brittle shellac***

EMILE BERLINER :: LATERAL-CUT DISC

1925 higher fidelity enabled with ***more durable materials***

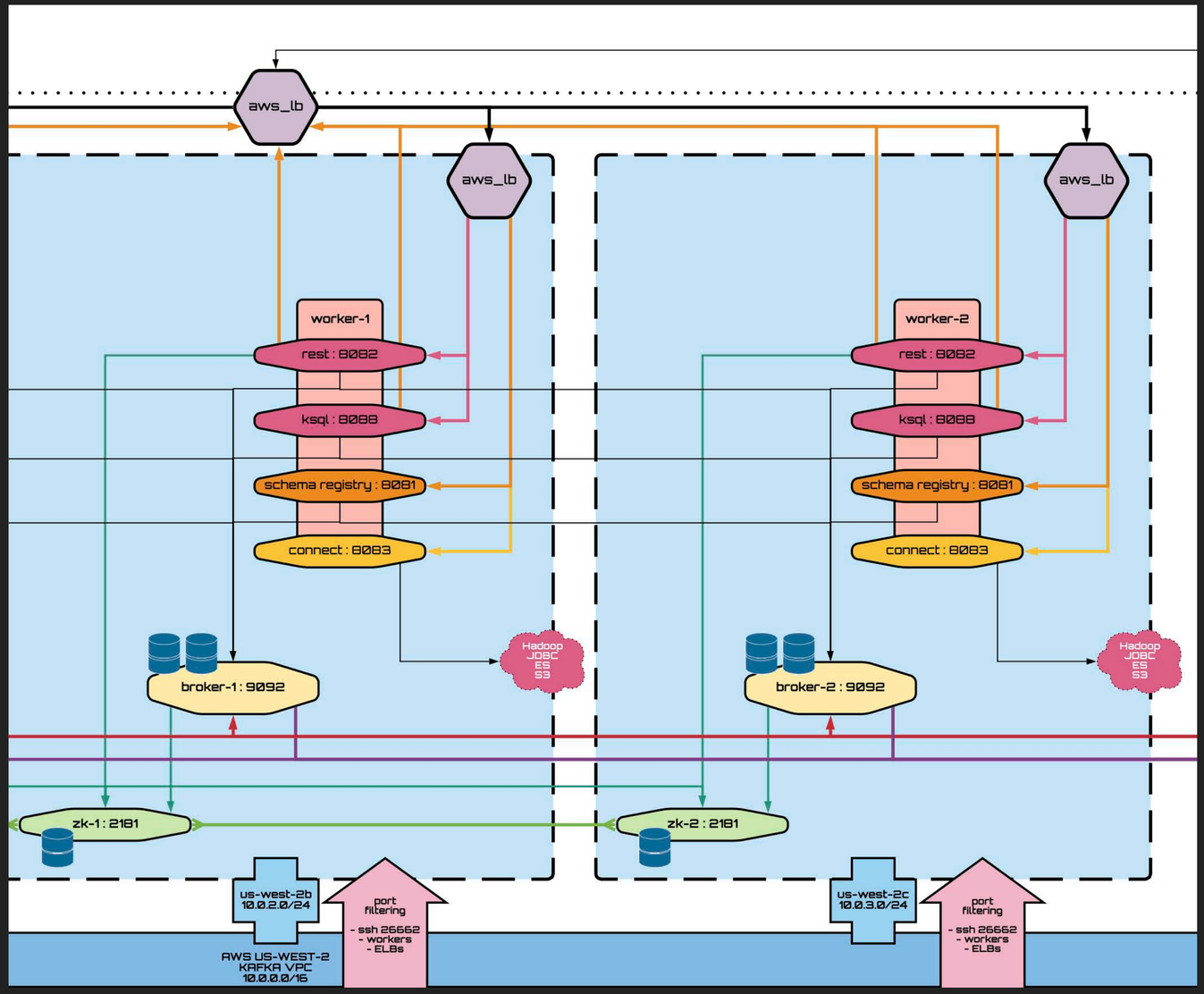
ELECTROMECHANICAL RECORDING

1950 STATE OF THE GROOVE

- Columbia has released the first ***12" 33 1/3rpm LP*** shortly before RCA Victor's ***7" 45rpm single***, both will become standards.
- Post-Depression manufacturing settled on what we use today: ***polyvinyl chloride***
- Many materials have seen the Groove and attempted the balance between robust **fidelity**, robust **economics**, and robust **durability**.

HIGH AVAILABILITY

- Redundancy designed so that if one part of the system fails, another part will cover its function.
- **Decreases efficiency**, increases cost.
- **Complexity we accept** at the price of higher guarantees.
- Some systems are **HA by design** for scale and scheduling (Kubernetes).
- Distributed **data replicas** (Kafka).



FALLBACKS

- A more granular form of availability that sacrifices accuracy or consistency.
- Calling services utilize **local cache** or **static data** when a dependency is degraded.
- Provide durability against network partitions.
- Could even be **latent data**: e.g. batching falls behind in one stage of a data stream without holding up downstream processing.

HISTORY IN

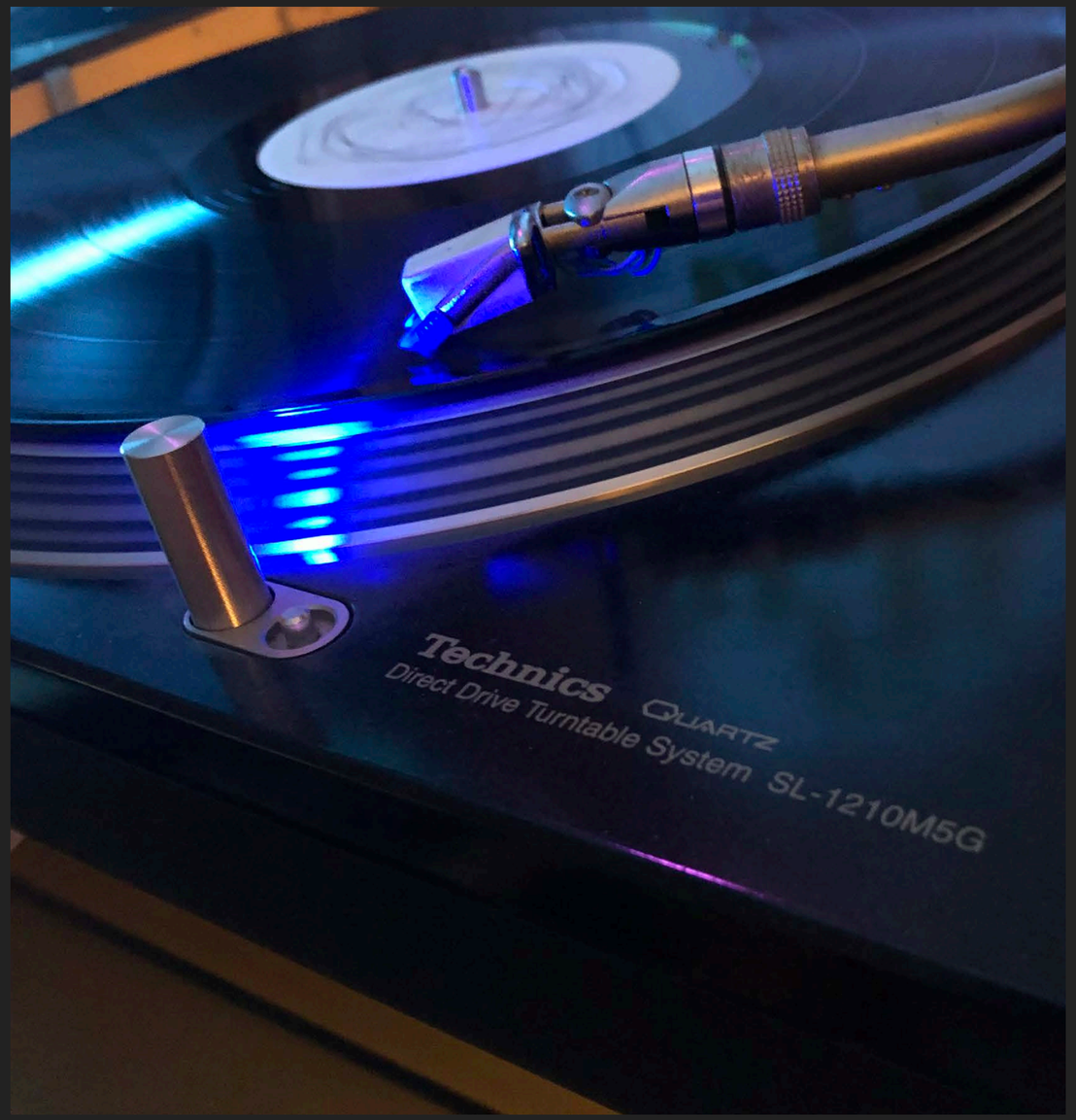
RELIABILITY

1970-2000 HIP HOP, SAMPLING, HOUSE

VINYL

DJ & TURNTABLISM

- The **magnetic direct drive** changes history for the role of **humans playing** the Groove.
- **Grandmaster Flash** pioneers the art of scratching, juggling, and other extended techniques that would make the sound an integral part of Hip Hop.
- **Christian Marclay** takes to vinyl for experimental non-dance sound collages.
- **Frankie Knuckles** mixes disco with rare soul beats, european synth, and rock music to make House.

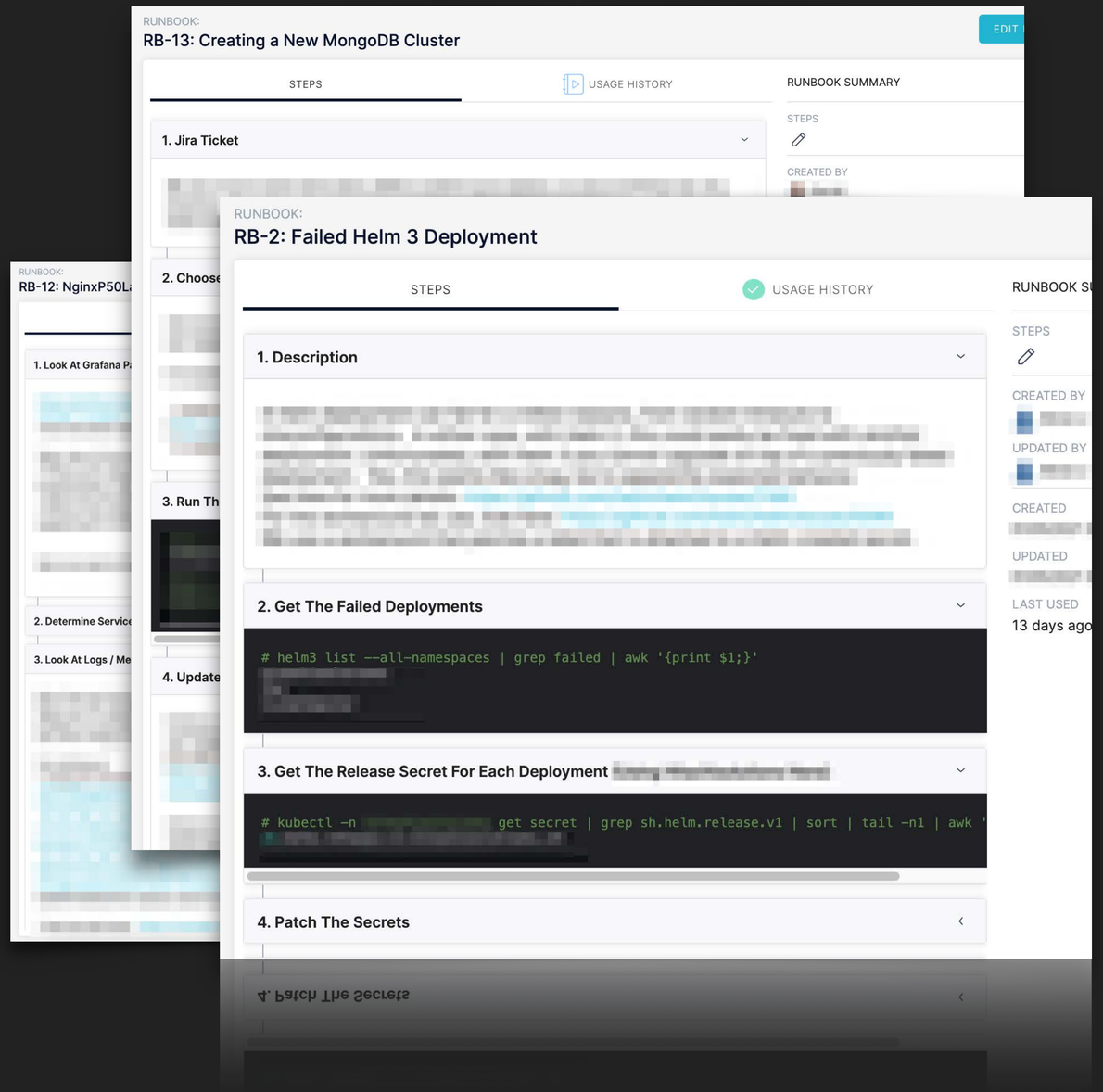


CHAOS ENGINEERING GAME DAYS

- **Validate** configurations & **Verify** outcomes
- **Iterate** for practice & **Introspect** models
- **Measure** capacity to **Manipulate** slack
- **Operable** tools & **Operational** readiness
- **Bridge** teams & **Break** assumptions
- **Embrace** ambiguity to **Experiment** assumption

RUNBOOKS

- Exploit learnings via **Shared Experience**
- Enhanced and informed by **Game Days**
- Critical points for **Common Grounding**
- Where we meet **Mental Models**
- Structures for **Improvisation**



SOURCES OF

RESILIENCE

1946-1965

X-RAY JAZZ

X-RAY MUSIC

- Much music became **forbidden** in post-war Soviet Russia, including popular jazz.
- **Telefunken recording lathe** made its way into Russia as spoils of war.
- **Golden Dog Gang** in Leningrad (St. Petersburg) the first record label to build their own lathes and record the **Groove** on **X Ray plates**.
- The creators were arrested multiple times over, only to return to underground Grooving once again.

Source: Stephen Coats, https://www.x-rayaudio.com, used by permission.

GRACEFUL EXTENSIBILITY

- **David Woods** describes this sense of Resilience as "the ability of a system to extend its capacity to adapt when surprise events challenge its boundaries."
- Adaptive capacity becomes *shared* by ***diverse, interdependent, networked entities***.

The theory of graceful extensibility: basic rules that govern adaptive systems

Woods, D.D. Environ Syst Decis 38, 433–457 (2018). https://doi.org/10.1007/s10669-018-9708-3

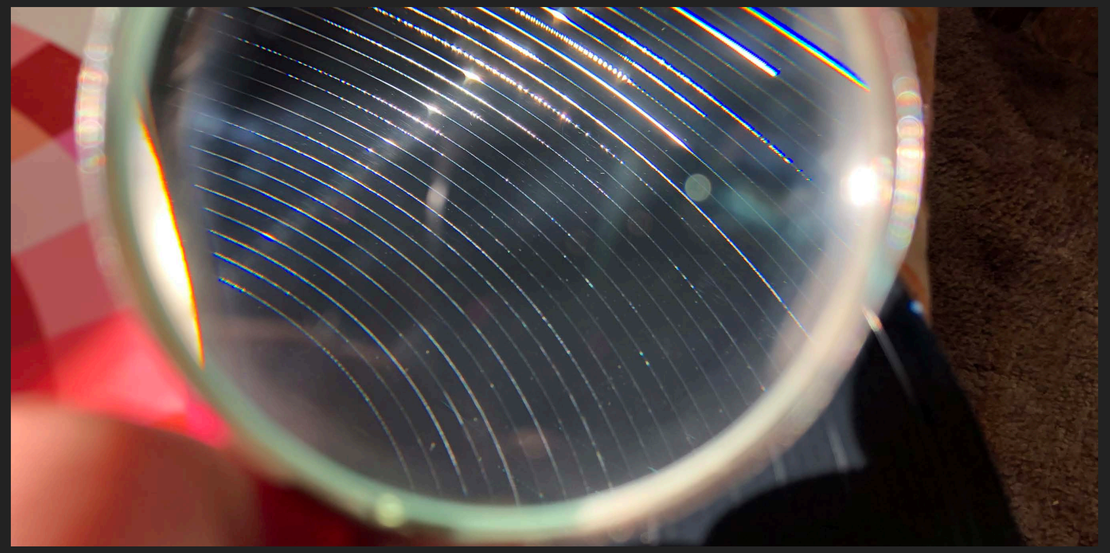
*...**groove** itself never changes!*

*the **ways humans adapted together** during extreme situations established the groove as a **source of resilience**.*

BUILD FOR ADAPTATION

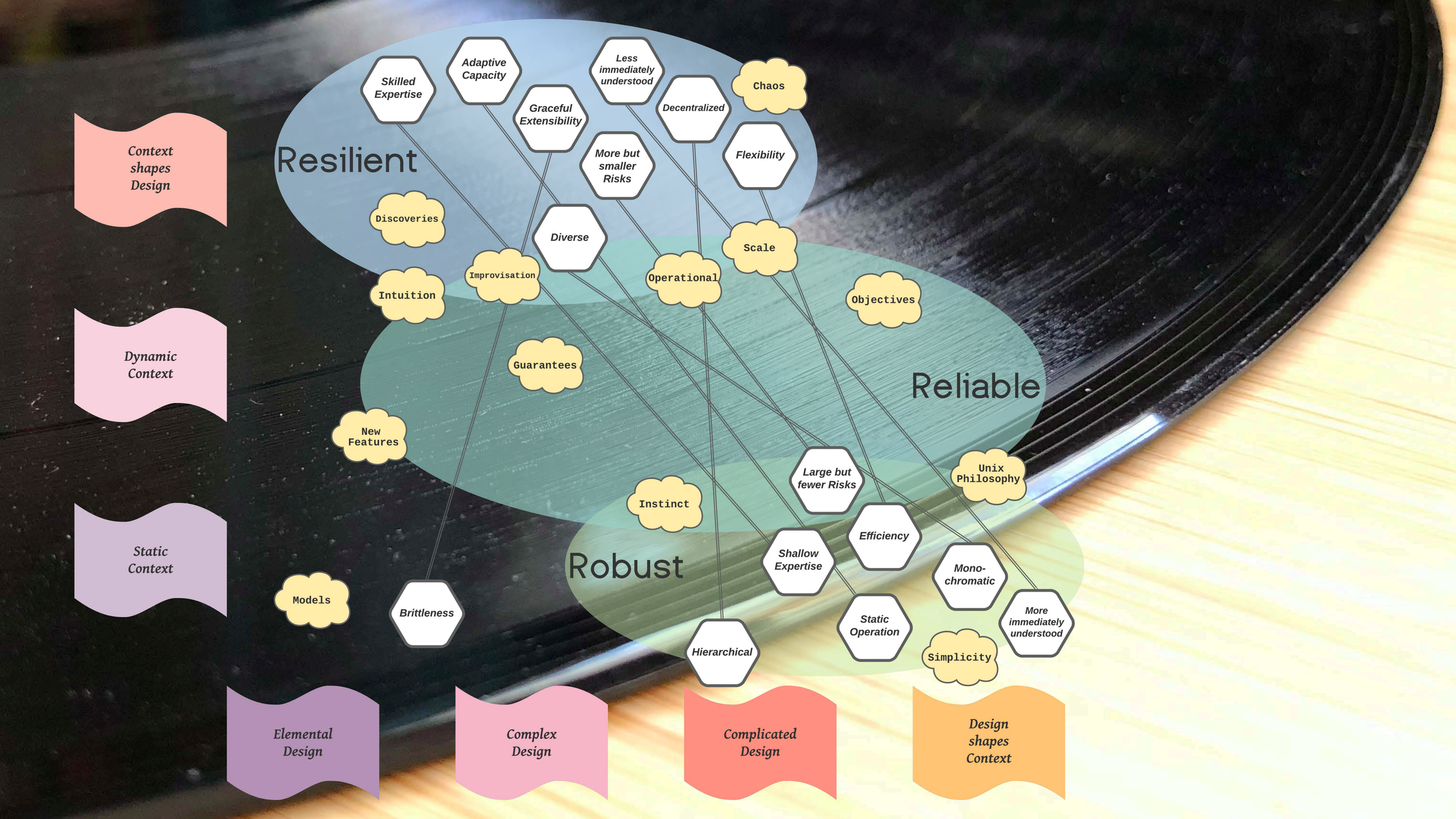
Richard Cook & Beth Adele Long investigate how a software org designs for adaptation.

- *Hallmarks of resilience include graceful extensibility and sustained adaptability.*
- *A small technical group to organize and revise a flexible technical support resource within a firm.*
- *The organization and revision comprise an example of resilience engineering.*
- *Resilience engineering occurs "in the wild"*



Building and revising adaptive capacity sharing for technical incident response: A case of resilience engineering

Richard I. Cook, Beth Adele Long. Applied Ergonomics.
Volume 90, 2021, 103240, ISSN 0003-6870.
https://doi.org/10.1016/j.apergo.2020.103240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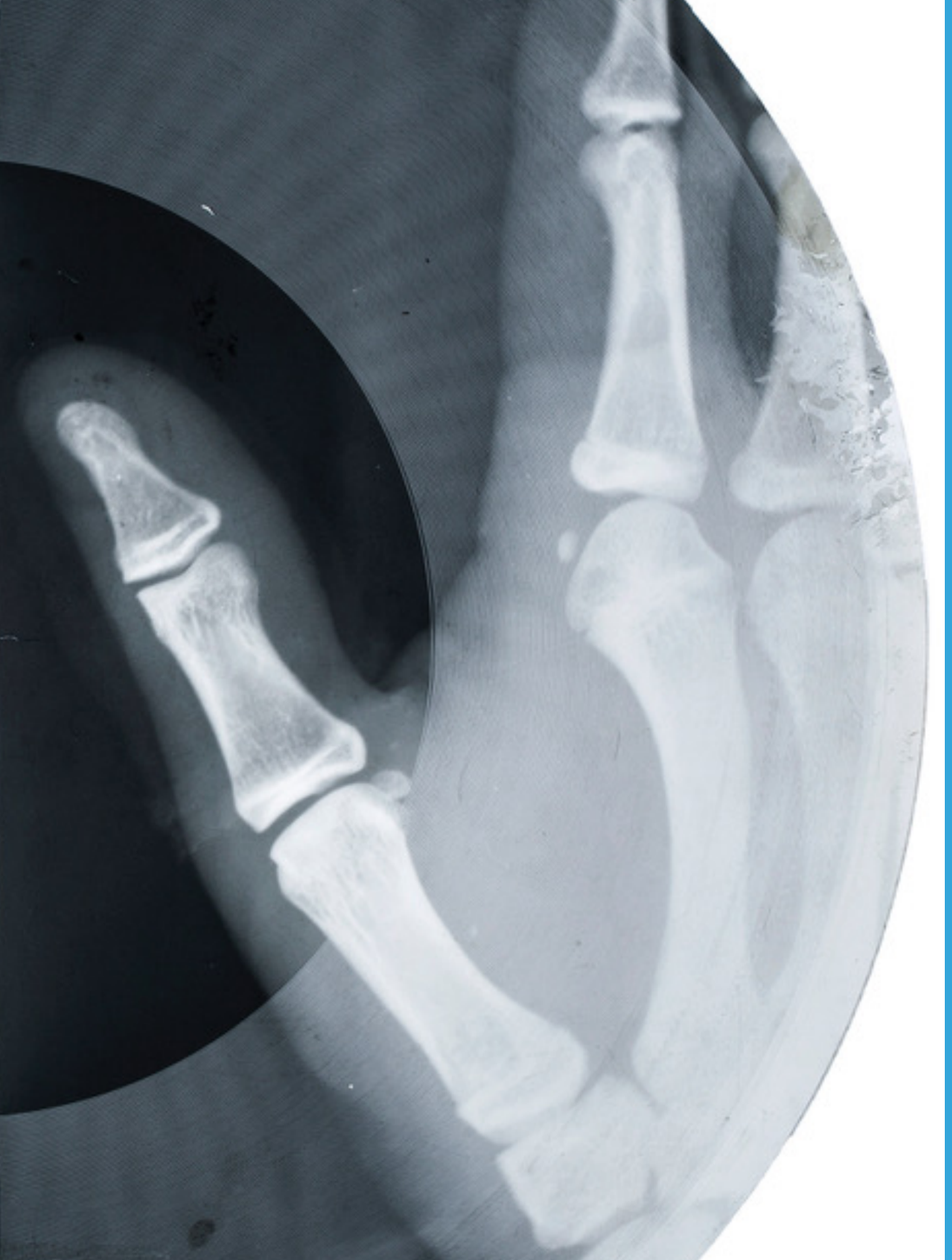

THANK YOU!

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