Don't let your ORGANIZATION write bad CODE

Luis Fernandez

We are here because we we have PASSION for our our craft

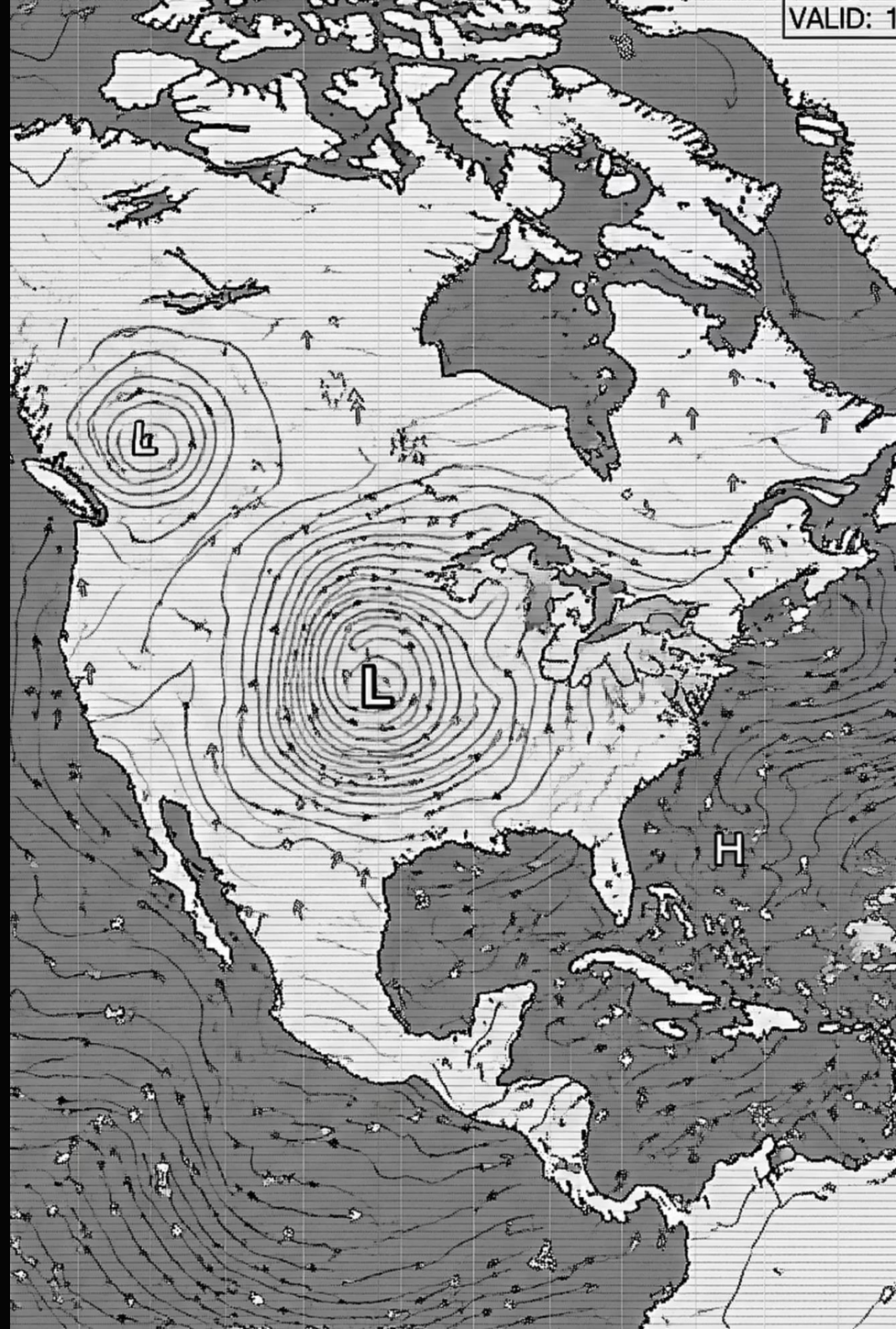
Coding

Luis Fernandez
VML

Coding

complicated

COMPLEX



Simple (Sencillo) — Complicated

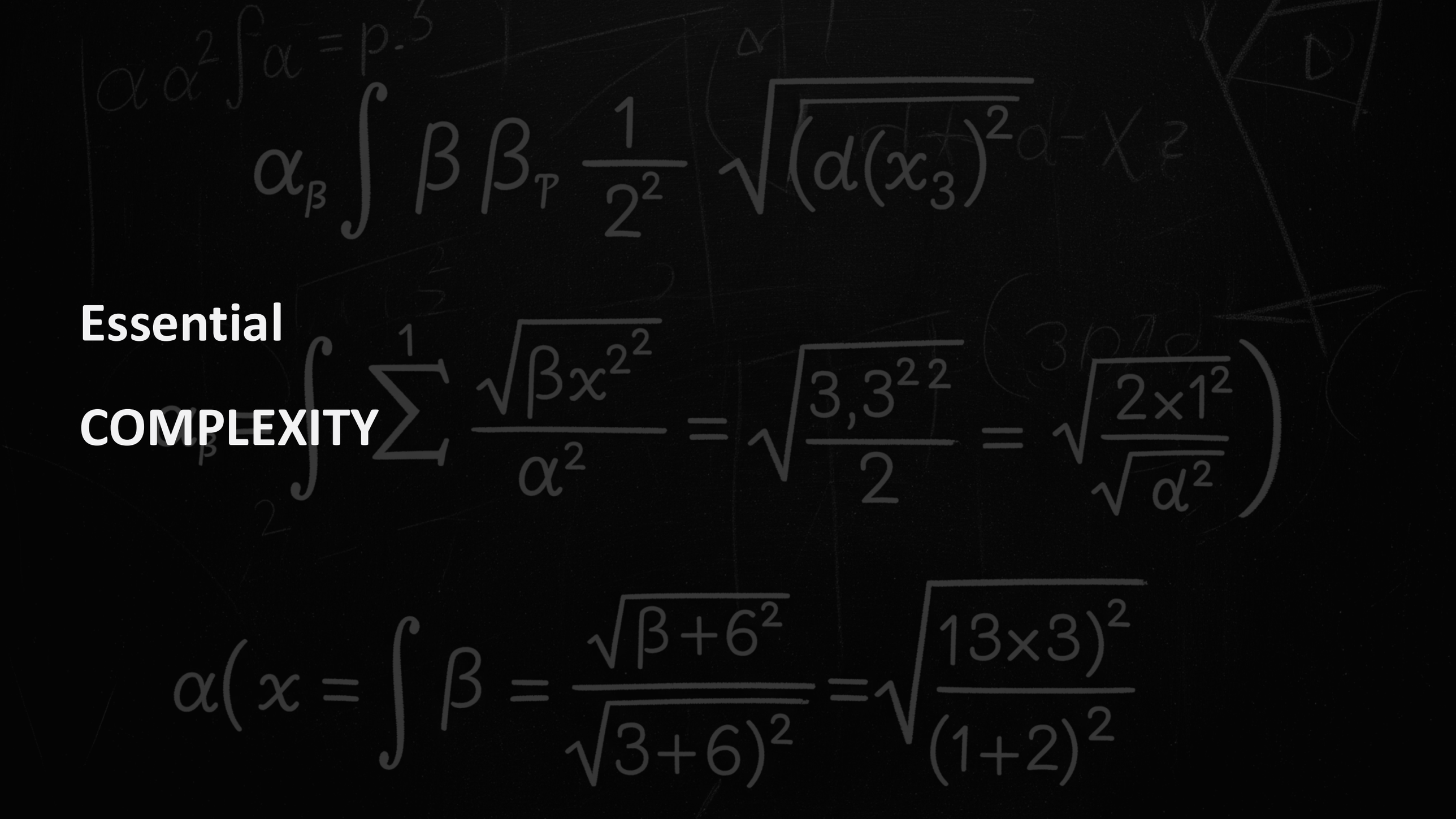
Simple — COMPLEX

Delivering Software is both
Complicated and COMPLEX

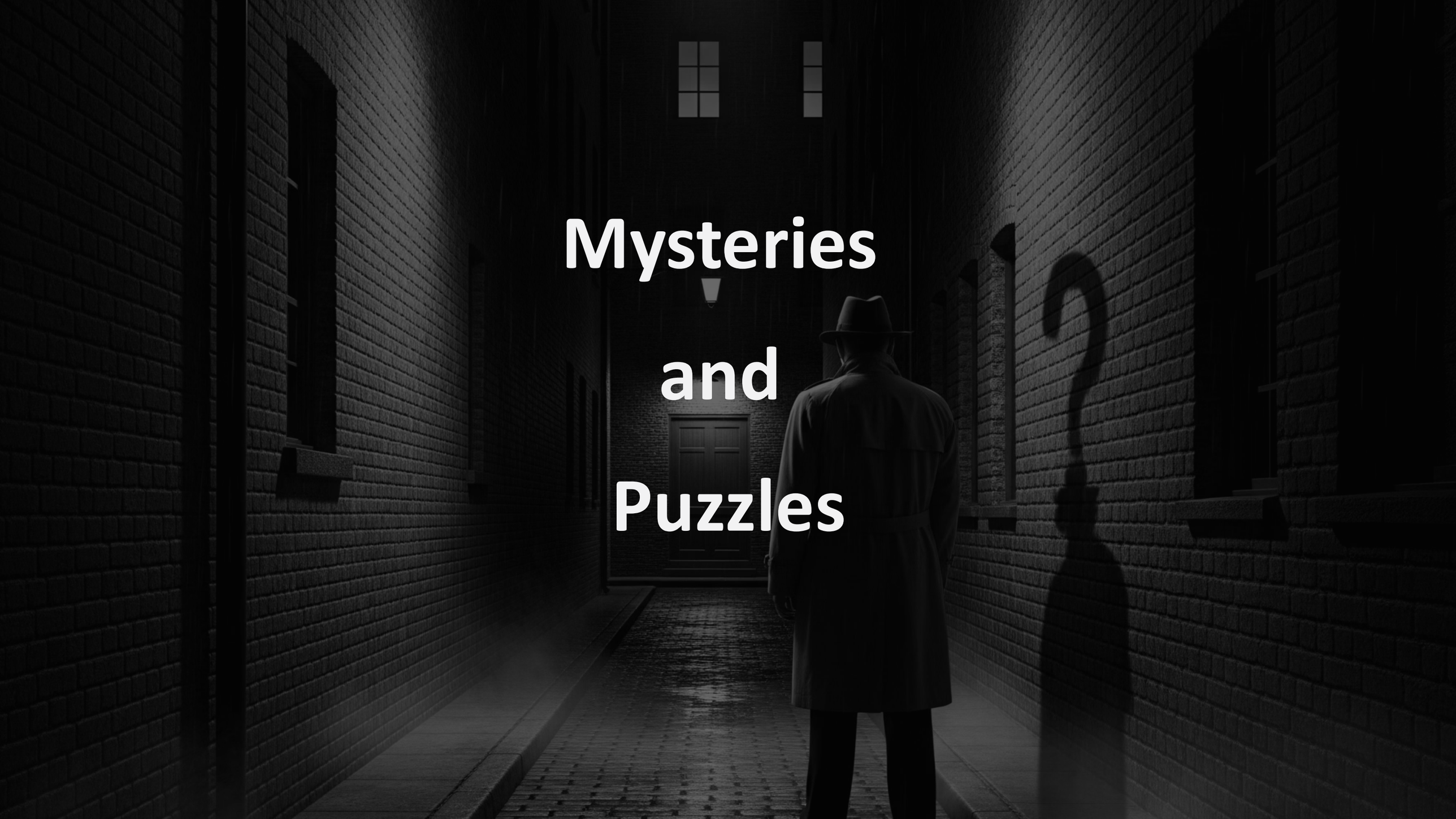
Very COMPLEX!

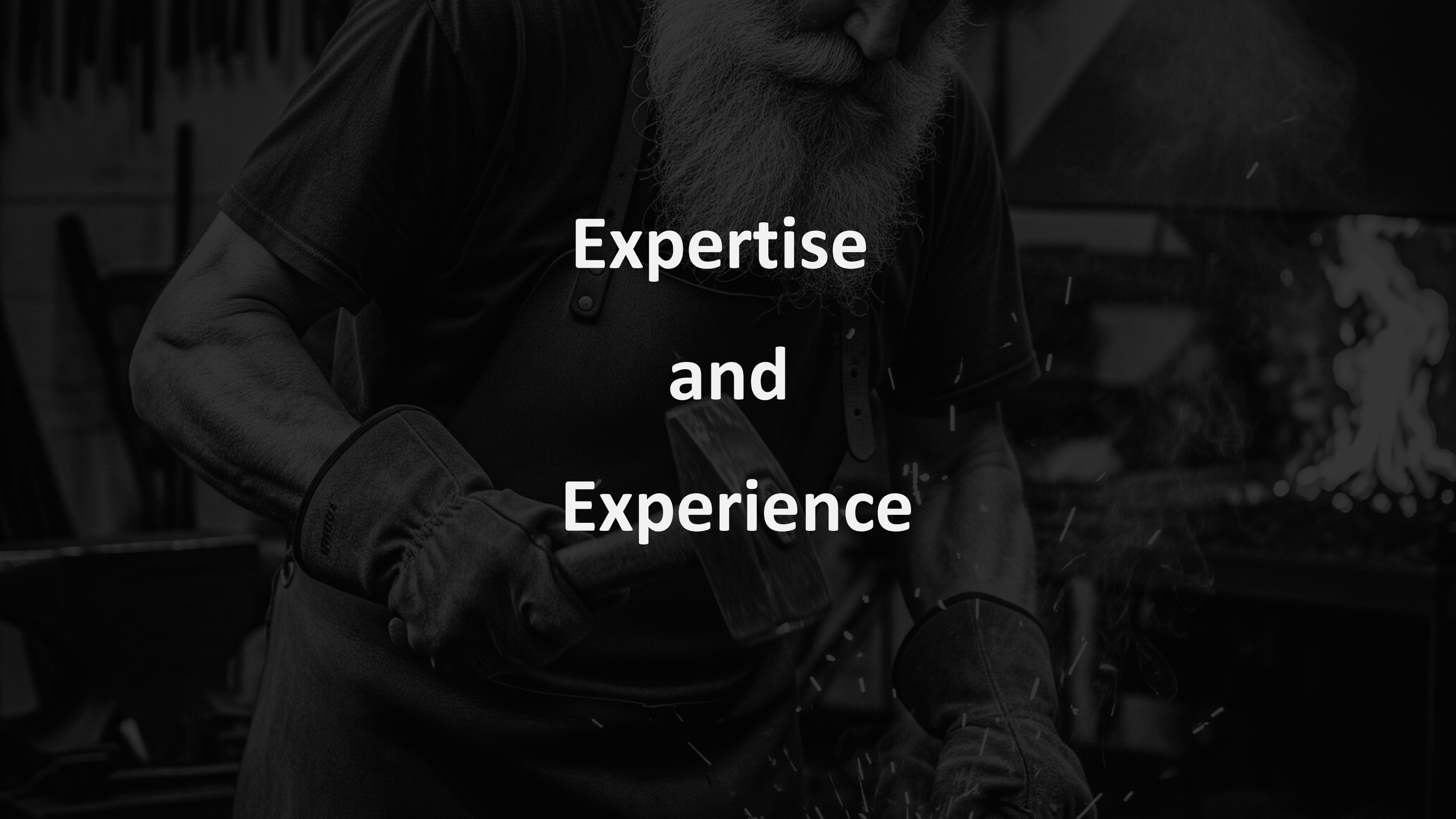
Essential

COMPLEXITY



Accidental
COMPLEXITY


Mysteries
and
Puzzles


Expertise
and
Experience

Simple (Sencillo) — Complicated

Simple — COMPLEX

Puzzle — Mystery

Expertise — Experience

CONTEXT

CODE

and

ORGANIZATIONS

The Same SYSTEM DESIGN

can result in

Different SYSTEMS

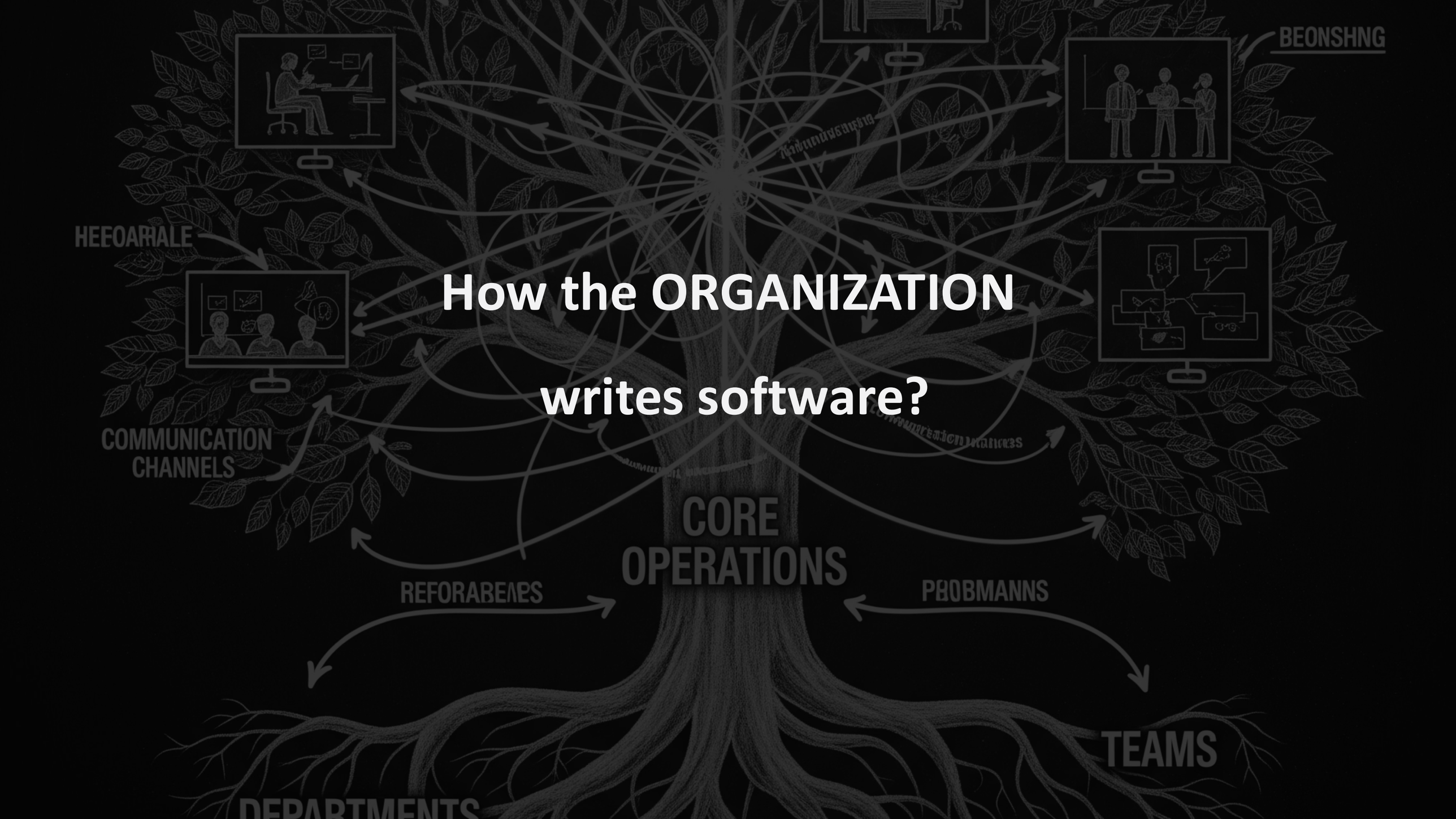
Different ORGANIZATIONS

will build Different

SYSTEMS

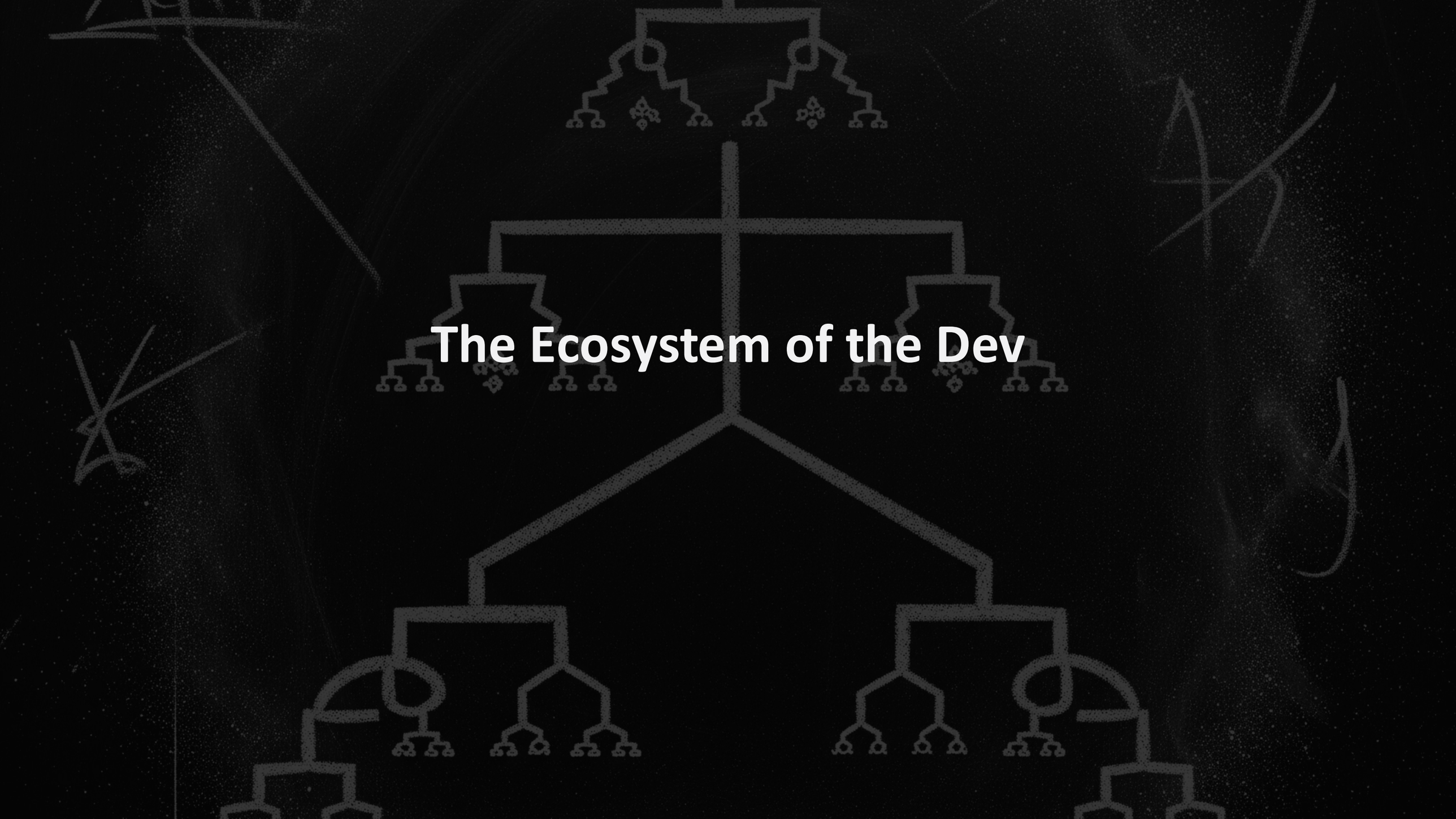
Good developers can make bad systems

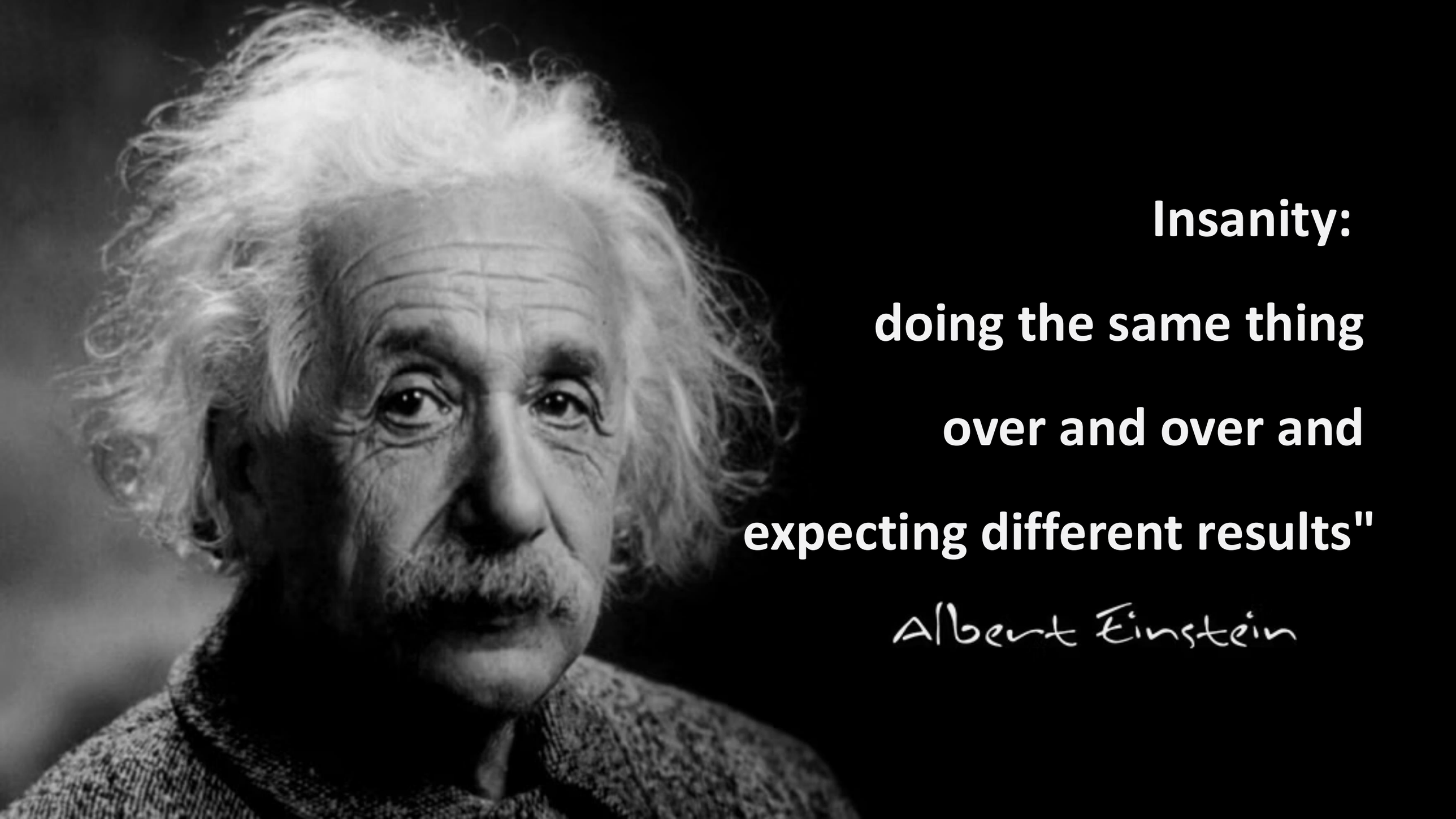
Average developers can make good software



How the ORGANIZATION

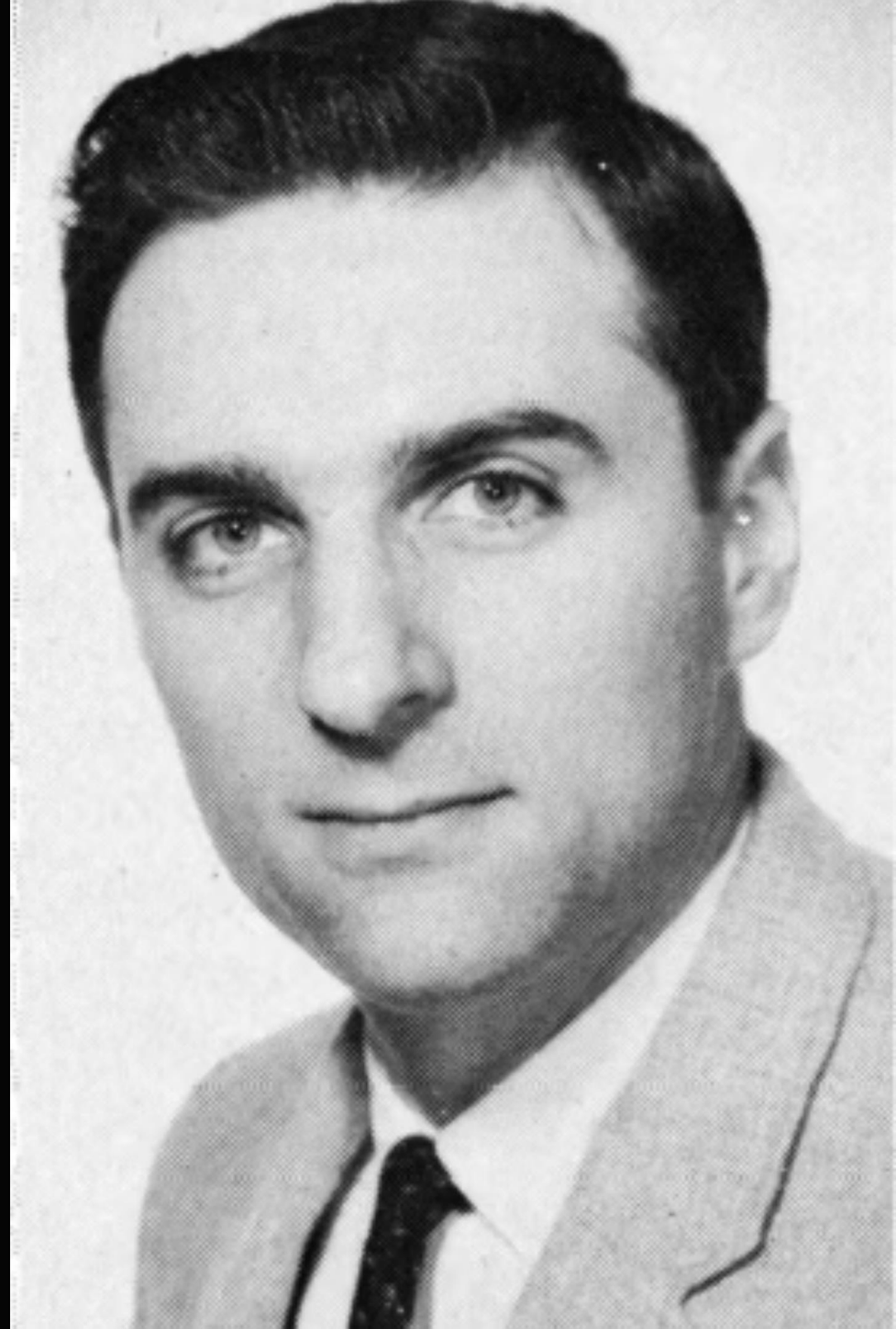
writes software?


The Ecosystem of the Dev


Insanity:
doing the same thing
over and over and
expecting different results"
Albert Einstein

FAKE
NEWS
Insanity:
doing the same thing
over and over and
expecting different results"
Albert Einstein

Conway…



HOW DO COMMITTEES INVENT?

by MELVIN E. CONWAY

That kind of intellectual activity which creates a useful whole from its diverse parts may be called the *design* of a *system*. Whether the particular activity is the creation of specifications for a major weapon system, the formation of a recommendation to meet a social challenge, or the programming of a computer, the general activity is largely the same.

Typically, the objective of a design organization is the creation and assembly of a document containing a coherently structured body of information. We may name this information the *system design*. It is typically produced for a sponsor who usually desires to carry out some activity guided by the system design. For example, a public official may wish to propose legislation to avert a recurrence of a recent disaster, so he appoints a team to explain the catastrophe. Or a manufacturer needs a new product and designates a product planning activity to specify what should be introduced.

The design organization may or may not be involved in the construction of the system it designs. Frequently, in public affairs, there are policies which discourage a group's acting upon its own recommendations, whereas, in private industry, quite the opposite situation often prevails.

It seems reasonable to suppose that the knowledge that one will have to carry out one's own recommendations or that this task will fall to others, probably affects some design choices which the individual designer is called upon to make. Most design activity requires continually making choices. Many of these choices may be more than design decisions; they may also be personal decisions the designer makes about his own future. As we shall see later, the incentives which exist in a conventional management environment can motivate choices which subvert the intent of the sponsor.[1]

stages of design

The initial stages of a design effort are concerned more with structuring of the design activity than with the system itself.[2] The full-blown design activity cannot proceed until certain preliminary milestones are passed. These include:

1. Understanding of the boundaries, both on the design activity and on the system to be designed, placed by the sponsor and by the world's realities.
2. Achievement of a preliminary notion of the system's organization so that design task groups can be meaningfully assigned.

We shall see in detail later that the very act of organizing a design team means that certain design decisions have already been made, explicitly or otherwise. Given any design team organization, there is a class of design alternatives which cannot be effectively pursued by such an organization because the necessary communication paths do not exist. Therefore, there is no such thing as a design group which is both organized and unbiased.

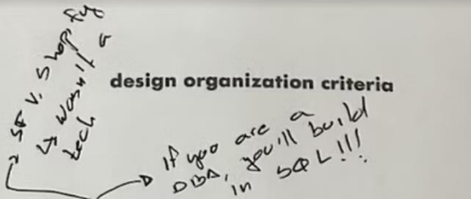
Once the organization of the design team is chosen, it is possible to delegate activities to the subgroups of the organization. Every time a delegation is made and somebody's scope of inquiry is narrowed, the class of design alternatives which can be effectively pursued is also narrowed.

Once scopes of activity are defined, a coordination problem is created. Coordination among task groups, although it appears to lower the productivity of the individual in the small group, provides the only possibility that the separate task groups will be able to consolidate their efforts into a unified system design.

Thus the life cycle of a system design effort proceeds through the following general stages:

1. Drawing of boundaries according to the ground rules.
2. Choice of a preliminary system concept.
3. Organization of the design activity and delegation of tasks according to that concept.
4. Coordination among delegated tasks.
5. Consolidation of subdesigns into a single design.

It is possible that a given design activity will not proceed straight through this list. It might conceivably reorganize upon discovery of a new, and obviously superior, design concept; but such an appearance of uncertainty is unflattering, and the very act of voluntarily abandoning a creation is painful and expensive. Of course, from the



Dr. Conway is manager, peripheral systems research, at Sperry Rand's Univac Div., where he is working on recognition of continuous speech. He has previously been a research associate at Case Western Reserve Univ., and a software consultant. He has an MS in physics from CalTech and a PhD in math from Case.

[1] A related, but much more comprehensive discussion of the behavior of system-designing organizations is found in John Kenneth Galbraith's, *The New Industrial State* (Boston, Houghton Mifflin, 1967). See especially Chapter VI, "The Technostructure."

[2] For a discussion of the problems which may arise when the design activity takes the form of a project in a functional environment, see C. J. Middleton, "How to Set Up a Project Organization," *Harvard Business Review*, March-April, 1967, p. 73.

Read the Original!!

"How Committees Invent?"

What Conway Said?

”Many of these choices may be more than design decisions; they may also be **personal decisions** the designer makes about his own future."

"...the very act of organizing a design team means that certain design decisions have been already been made, **explicitly** or otherwise"

"Once scopes of activities are defined, a **coordination problem** is created."

What Conway Said?

"Consider the following **'proof**'" ... "roughly speaking, we have demonstrated that there is a very close relationship between the structure of a system and the structure of the organization which designed it."

"...given any system design, someone someday **will find a better one** to do the same job"

What Conway Said?

"Measurements of resources **from conventional accounting**" ..."One fallacy behind this calculation is the property of linearity which says that two men working for a year or one hundred men working for a week are resources of equal value."

"Assumptions which are adequate for peeling potatoes and erecting brick walls **fail** for designing systems."

"Probably the greatest single common factor behind many poorly designed systems now in existence has been **the availability of a design organization** in need of work."

His Conclusions

"...organizations which design systems ... are **constrained** to produce designs which are copies of the communication structures of these organizations"

"A criterion for the **structuring** of design organizations: a design effort should be organized according to the need for communication."

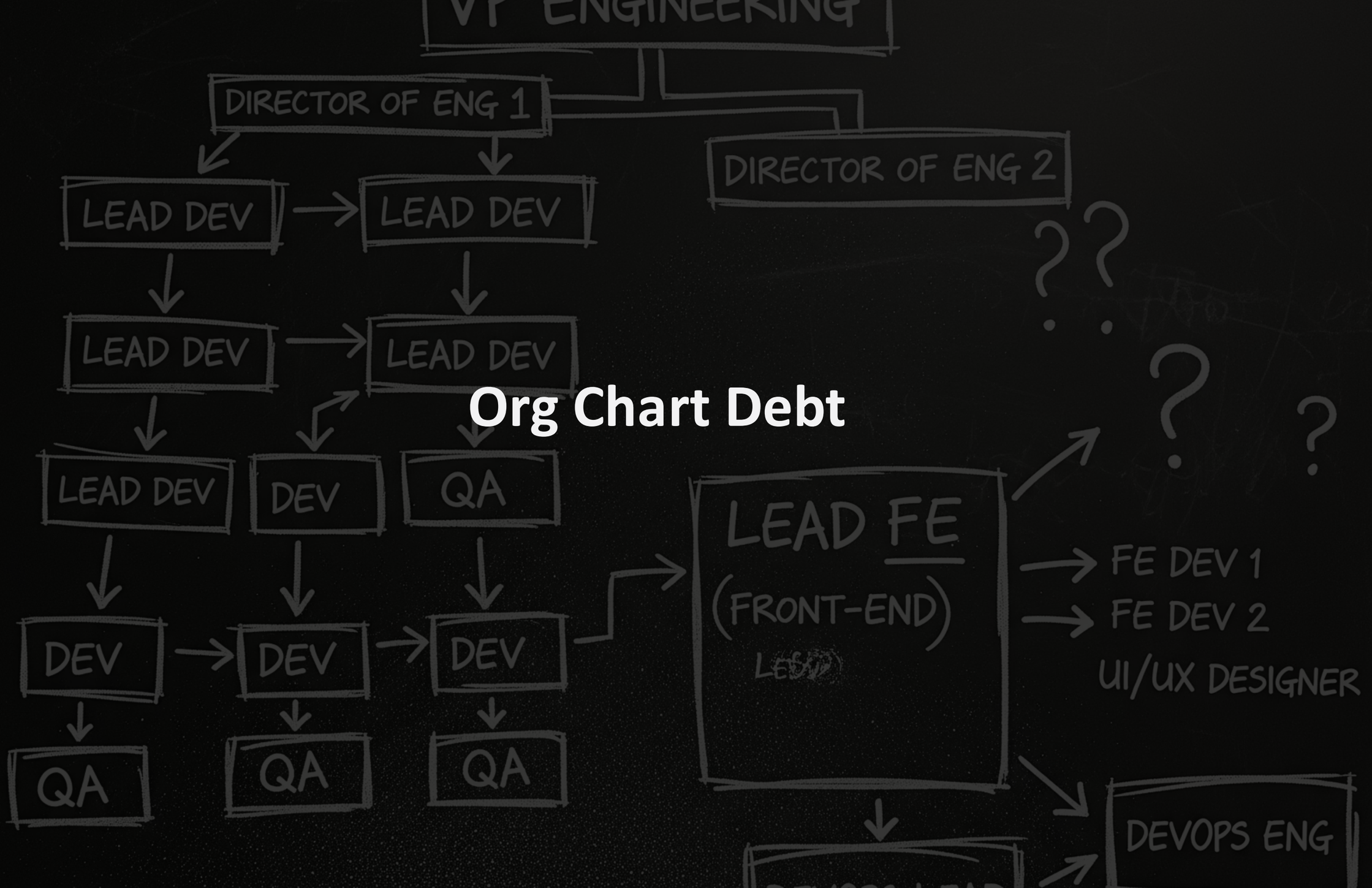
His Conclusions

"Because the design which occurs first is almost never the best, the prevailing system concept may need to **change**. Therefore, flexibility of organization is important to effective design"

"Ways must be found to **reward** design managers for keeping their organizations lean and flexible"

"There is a need for a **philosophy of system design** management which is not based on the assumption that adding manpower simply adds to productivity"

Is HR architecting your softwre?



Org Chart Debt

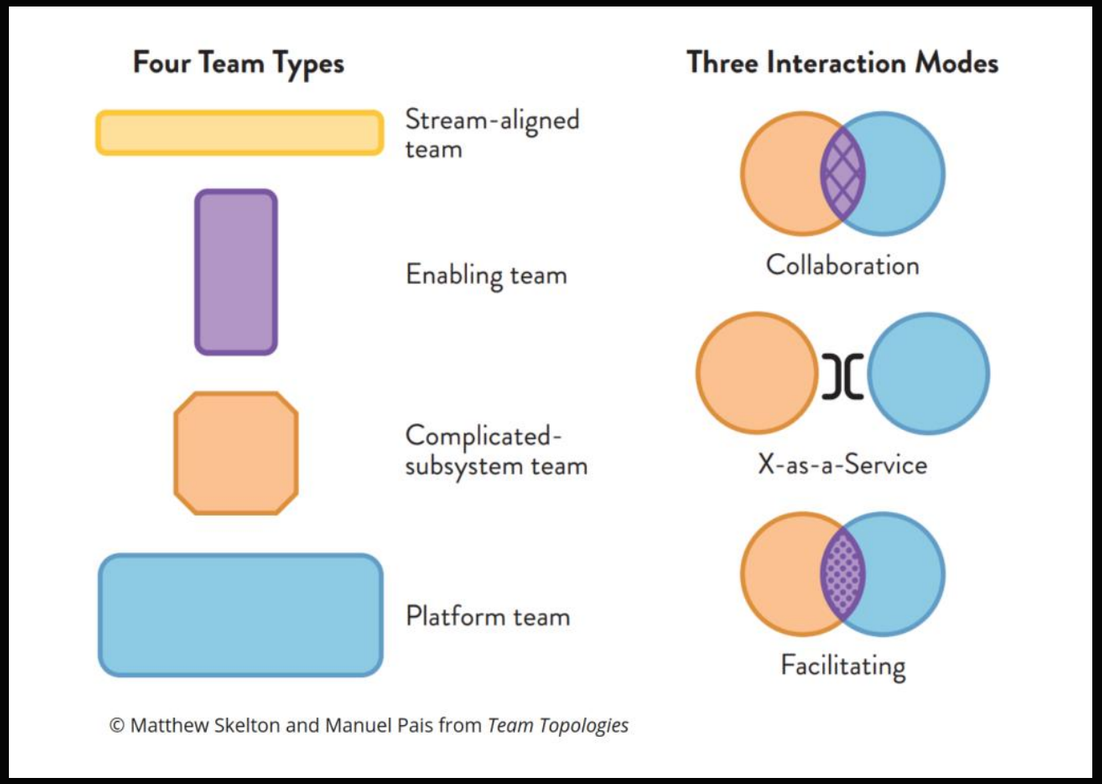
Frameworks and Platforms: The Canned Conway

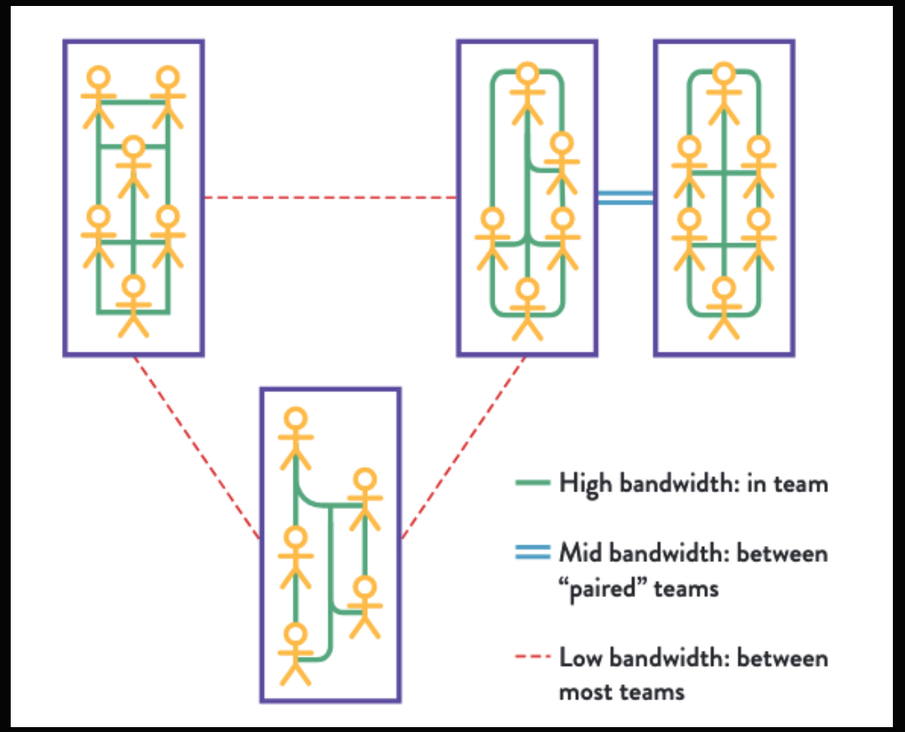
Ants and Conway

Team Topologies

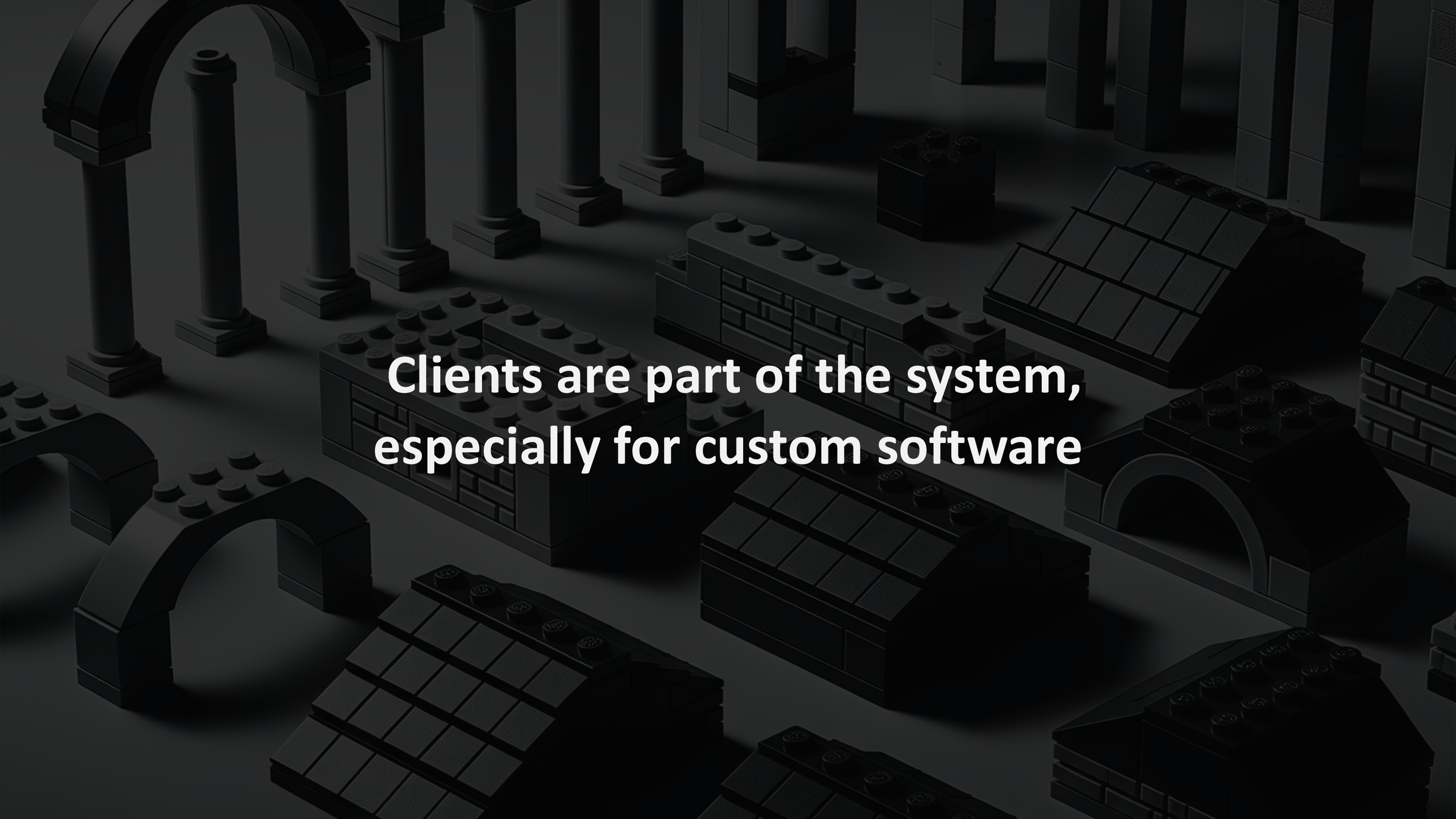
- Cognitive Load as a Design Constraint
- Focus on Flow, Not Structure
- Keep Teams Together

Team Topologies





Inverse Conway Maneuver


Clients are part of the system,
especially for custom software

Airlines and Conway

Why is this relevant to you?

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DANK JE WEL!

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Luis Fernandez