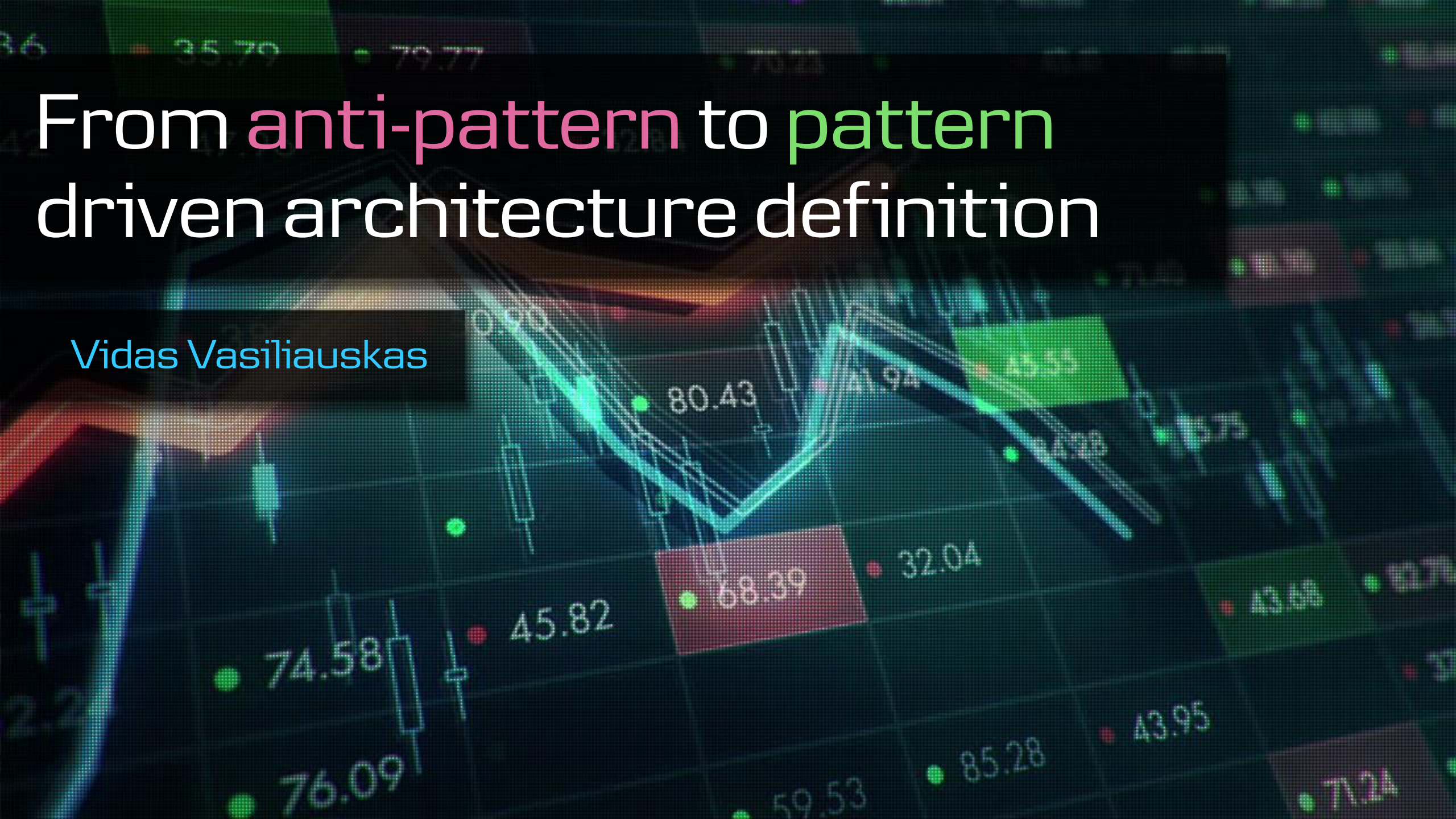
From anti-pattern to pattern driven architecture definition

Vidas Vasiliauskas



About me

Vidas Vasiliauskas

Head of
Trading Services

Danske Bank

Lecturer
Software Architecture

VILNIAUS UNIVERSITETAS · 1579 · UNIVERSITAS VILNENSIS


Danske Bank
Markets IT
294
employees
70
systems
2056
servers

Danske Bank

Trading Services

5 teams

2 countries

271 services

Architecture vs Design

Architecture represents significant decisions
that shape a system(-s),
where significance is measured by
cost of change

Decision guidance

Common smells / anti-patterns

Common smells / anti-patterns

CV Driven development

Common smells / anti-patterns

CV Driven development

Truck factor of 0

Common smells / anti-patterns

CV Driven development

Truck factor of 0

Single horse race

Common smells / anti-patterns

CV Driven development

Truck factor of 0

Single horse race

Ninja move

Architecture drivers

Architecture drivers

Company Vision

Architecture drivers

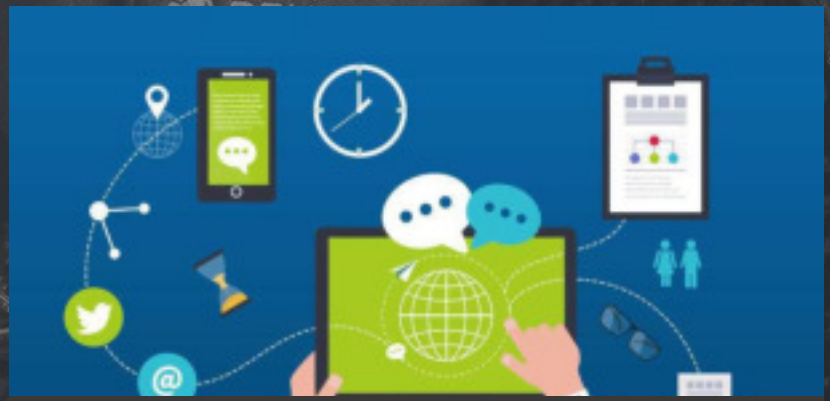
Company Vision

Business Strategy

Architecture drivers

Company Vision

Business Strategy

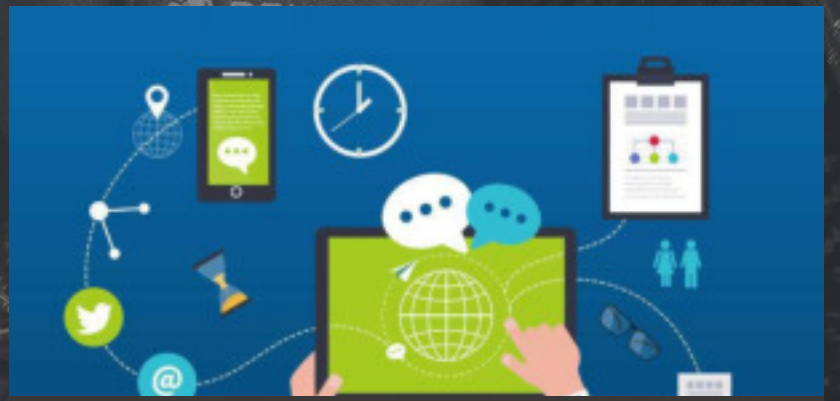


User Habits

Architecture drivers

Company Vision

Business Strategy



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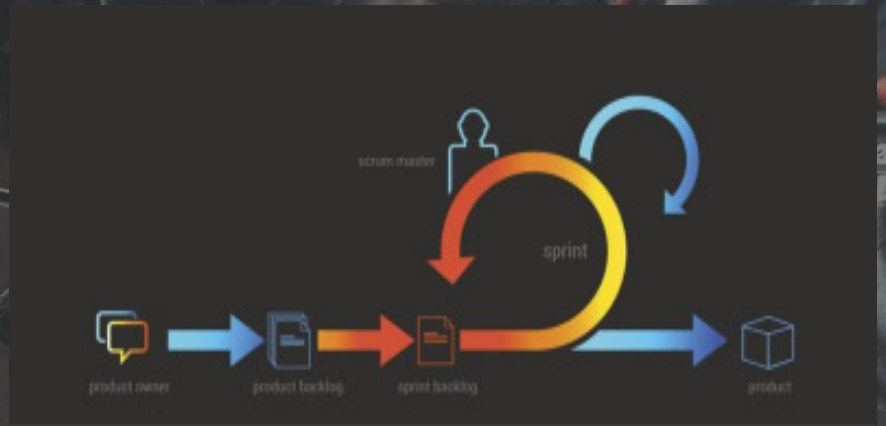
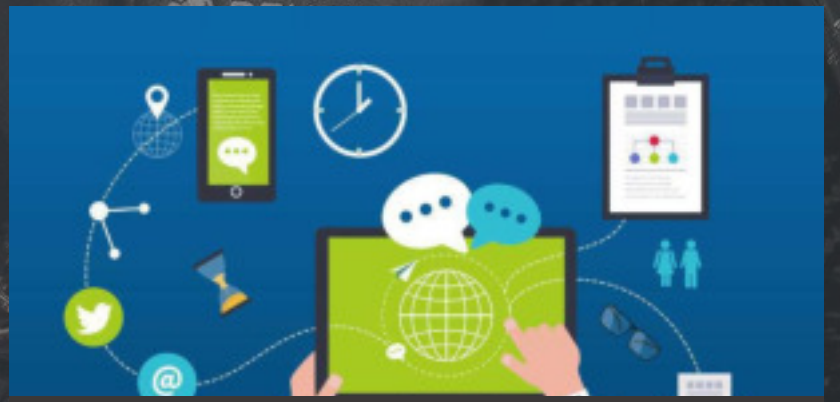


Development Model

Architecture drivers

Company Vision

Business Strategy



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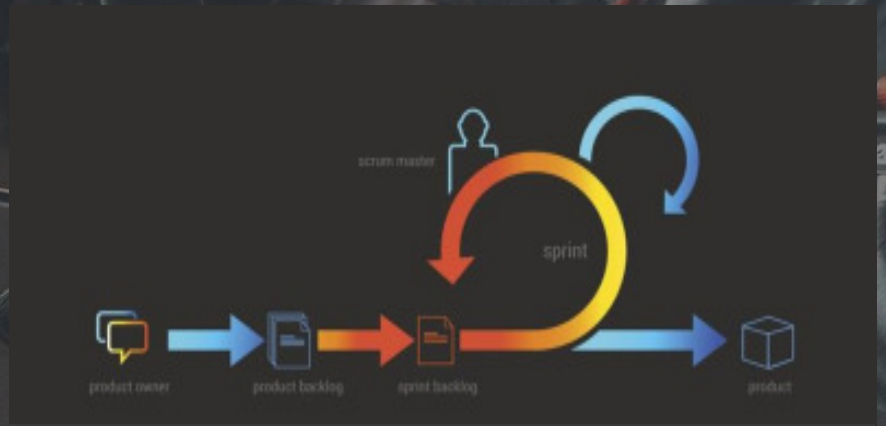


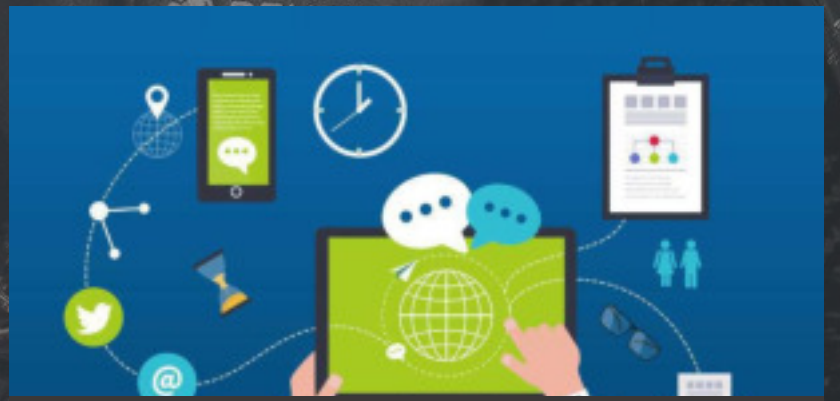
Development Model

IT Strategy

Architecture drivers

Company Vision

Business Strategy



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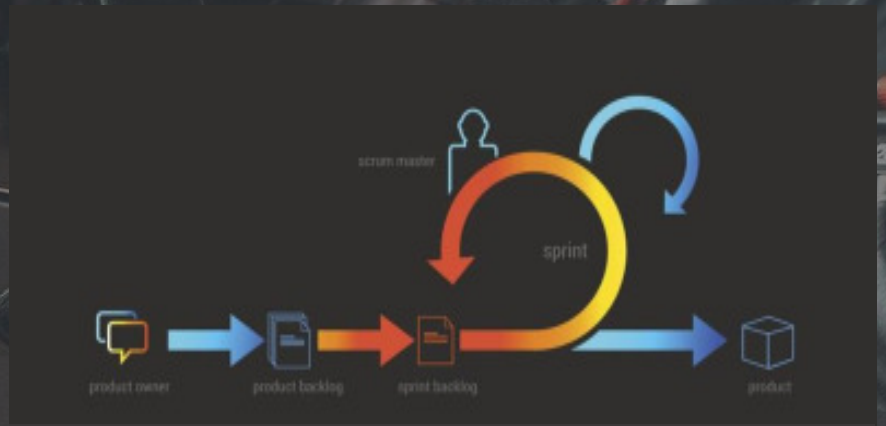
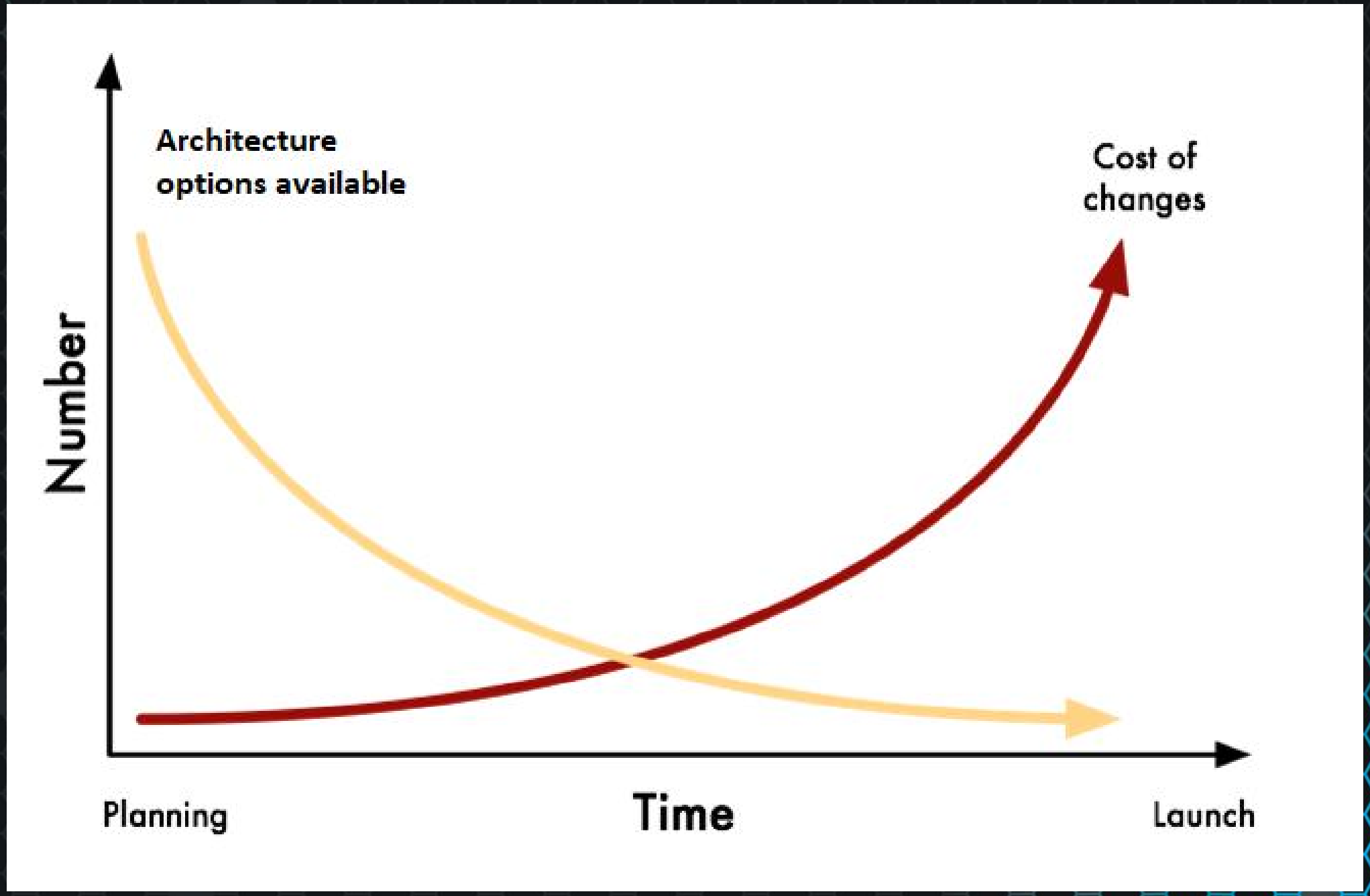


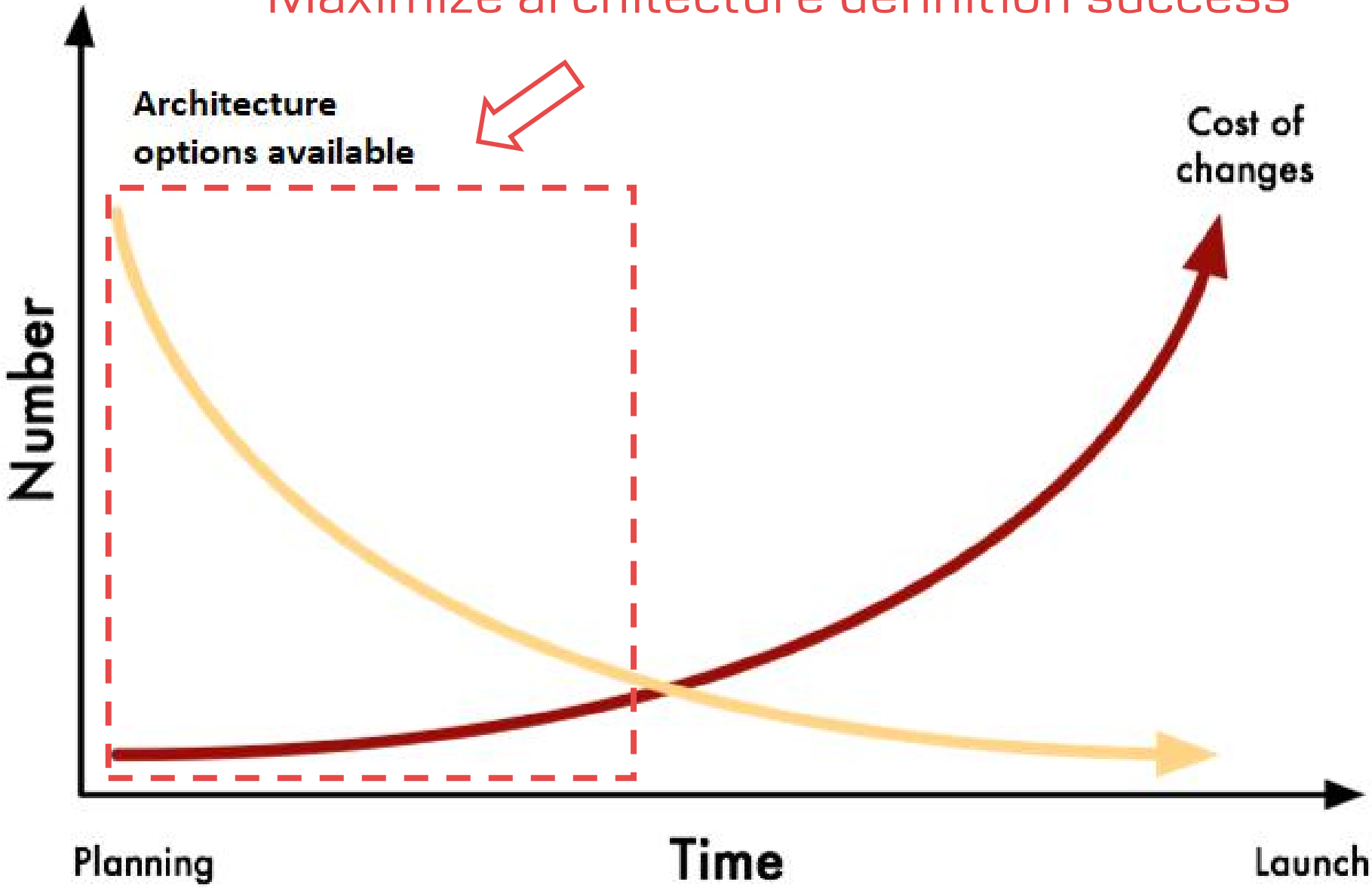
Development Model

IT Strategy

Technology Trends


Architecture
options available
Cost of
changes
Number
Planning
Time
Launch

Maximize architecture definition success



How we do it in Trading Services

How we do it in Trading Services

Architecture committee

Architecture committee

How we do it in Trading Services

- Architecture committee
- Architecture owner

Architecture owner

Anyone who has enough technical respect points to spend on risky decisions and still get away with it

How we do it in Trading Services

- Architecture committee
- Architecture owner
- Dedicated time

How we do it in Trading Services

- Architecture committee
- Architecture owner
- Dedicated time

How we do it in Trading Services

- Architecture committee
- Architecture owner
- Dedicated time

Architecture definition practices

Architecture strategy

Architecture strategy

Business Capabilities (BC)

Ability to provide competitive business services

Evolution (E)

Ease of new development in existing code

Run Cost (RC)

Operational costs and quality

Architecture strategy

Data Backbone (Centralize and leverage owned data)

Drivers: BC **Responsible**: Mr. Joker

Micro GUIs (Split our platform into smaller products)

Drivers: E, BC **Responsible**: Batman

Business Capabilities (BC)

Ability to provide competitive business services

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Architecture strategy

Data Backbone (Centralize and leverage owned data)

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Micro GUIs (Split our platform into smaller products)

Drivers: E, BC **Responsible**: Batman

Standardize usage of Kafka for events

Drivers: E, RC **Responsible**: John Rambo

Centralized log storage and monitoring

Drivers: RC **Responsible**: Steven Seagull

Business Capabilities (BC)

Ability to provide competitive business services

Evolution (E)

Ease of new development in existing code

Run Cost (RC)

Operational costs and quality

Architecture strategy

2019 H1

Data Backbone (Centralize and leverage owned data)
Drivers: BC **Responsible**: Mr. Joker

Micro GUIs (Split our platform into smaller products)
Drivers: E, BC **Responsible**: Batman

Standardize usage of Kafka for events
Drivers: E, RC **Responsible**: John Rambo

Centralized log storage and monitoring
Drivers: RC **Responsible**: Steven Seagull

Business Capabilities (BC)
Ability to provide competitive business services

Evolution (E)
Ease of new development in existing code

Run Cost (RC)
Operational costs and quality

Architecture strategy

Initiatives below to run during 2019 supported by drivers described in a section to the right. Each initiative have people responsible to run it.

APIs

External APIs – used by our colleagues in other departments/teams. Internal APIs – used by UI and other services. HTTP (REST) and streaming APIs (Kafka, AMPS, etc)

Responsible: GSAG, KOSA. **Drivers**: BC, E

Split GUIs

Split GUIs into product specific GUIs when possible. Examples: Split Import, DCM, RD Auctions, etc

Responsible: VVAS, PANO. **Drivers**: BC, E

Leverage data

Blue Ocean. Corporate actions. Front Office owns position. PL and Risk in BETS 👎. SuperFly for price/yield calculation 👎

Responsible: KOSA, VVAS. **Drivers**: BC, RC

Reference Data

Migrate to new SMF data model and stop using BETS Legacy data model

Responsible: HADAM. **Drivers**: RC, E

Strategy Drivers

BETS strategy is defined by drivers below

Business capabilities and opportunities (BC)

Implementation of new products and better service

Evolution (E)

Development of existing products and migration to new technology

Run Cost (RC)

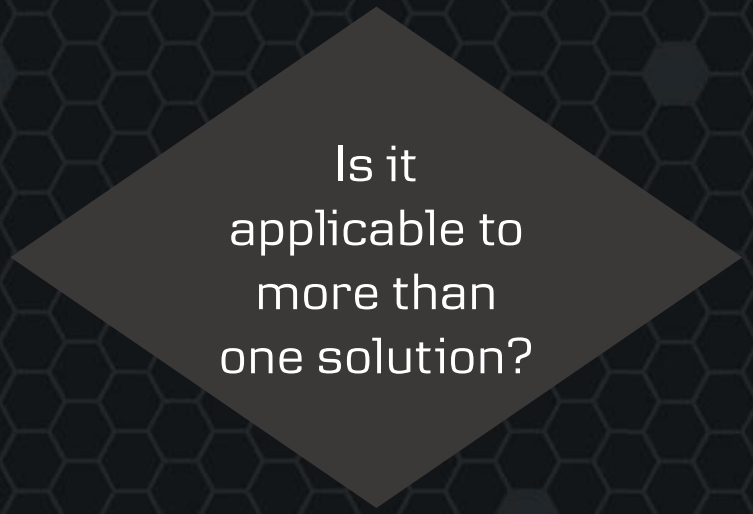
Cost of support and development. Quality

Smaller initiatives to be finished in 2019 H1

- **Project Lead and Project Page roll out** ✅
  Responsible: KOSA
- **Standardization (Builds, Deployments, change requests ✅, versioning, packaging, libraries, GIT repos, code style ℹ️, etc)**
  Responsible: PANO, GSAG
  - Builds ℹ️ - MKRA, GSAG - write up
  - Packaging - MKRA, GSAG - discuss

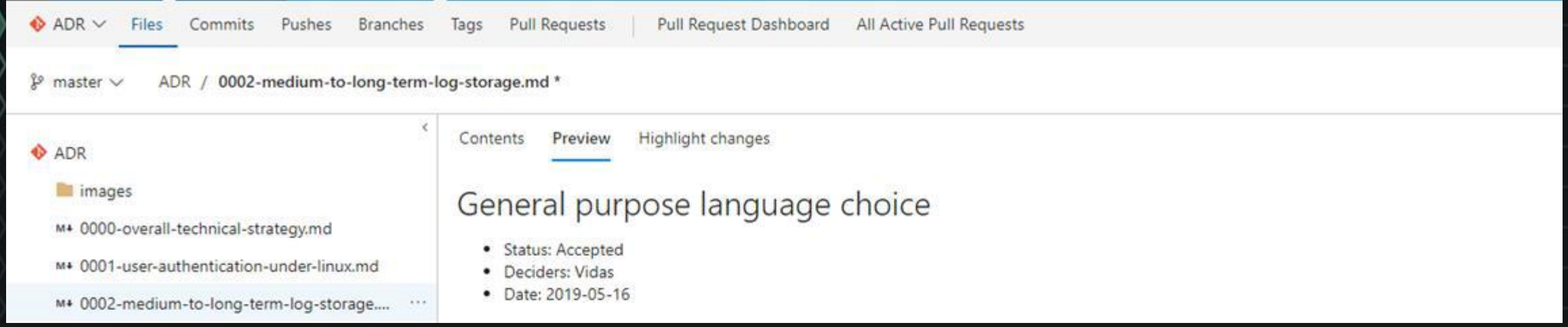
Picking decision record

Picking decision record



Picking decision record

ADR (Architectural Decision Record)


ADR
Files
Commits
Pushes
Branches
Tags
Pull Requests
Pull Request Dashboard
All Active Pull Requests
master
ADR / 0002-medium-to-long-term-log-storage.md *
ADR
images
0000-overall-technical-strategy.md
0001-user-authentication-under-linux.md
0002-medium-to-long-term-log-storage....
Contents
Preview
Highlight changes
General purpose language choice
Status: Accepted
Deciders: Vidas
Date: 2019-05-16

ADR Files Commits Pushes Branches Tags Pull Requests | Pull Request Dashboard All Active Pull Requests

master ADR / 0002-medium-to-long-term-log-storage.md *

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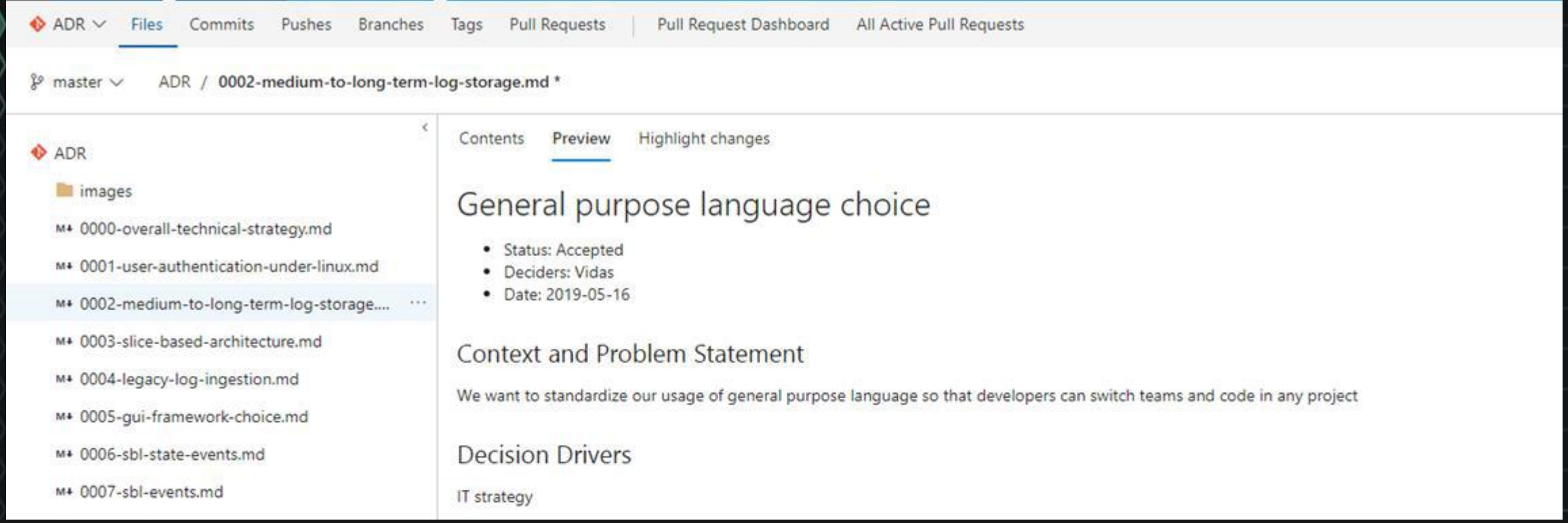
Context and Problem Statement

We want to standardize our usage of general purpose language so that developers can switch teams and code in any project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Decision Drivers

IT strategy

Considered Options (At least 2)

- C#
- F#

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- 0012-readme-template.md
- 0013-bts-kafka-topics.md

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- C#
- F#

Decision Outcome

- F#

ADR | Files | Commits | Pushes | Branches | Tags | Pull Requests | Pull Request Dashboard | All Active Pull Requests

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Decision Drivers

IT strategy

Considered Options (At least 2)

- C#
- F#

Decision Outcome

- F#

Pros and Cons of the Options

- C# - does not have keyword "fun"
- F# - does have a keyword "fun"

General purpose language choice

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We want to standardize our usage of general purpose language so that developers can switch teams and code in any project

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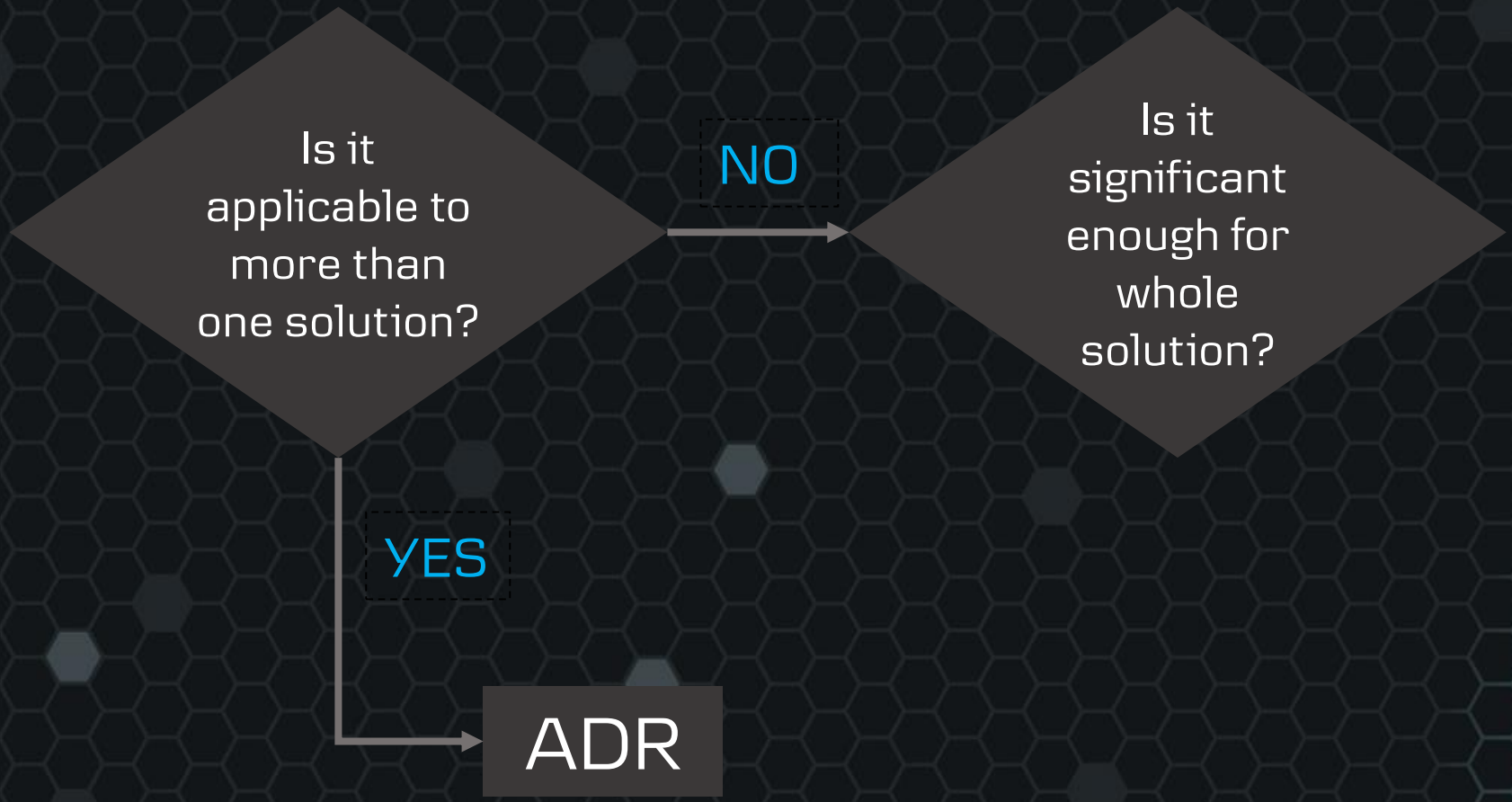
Supporting Links/References <!-- optional -->

Paid and sponsored by Microsoft corporation </joke>

Picking decision record



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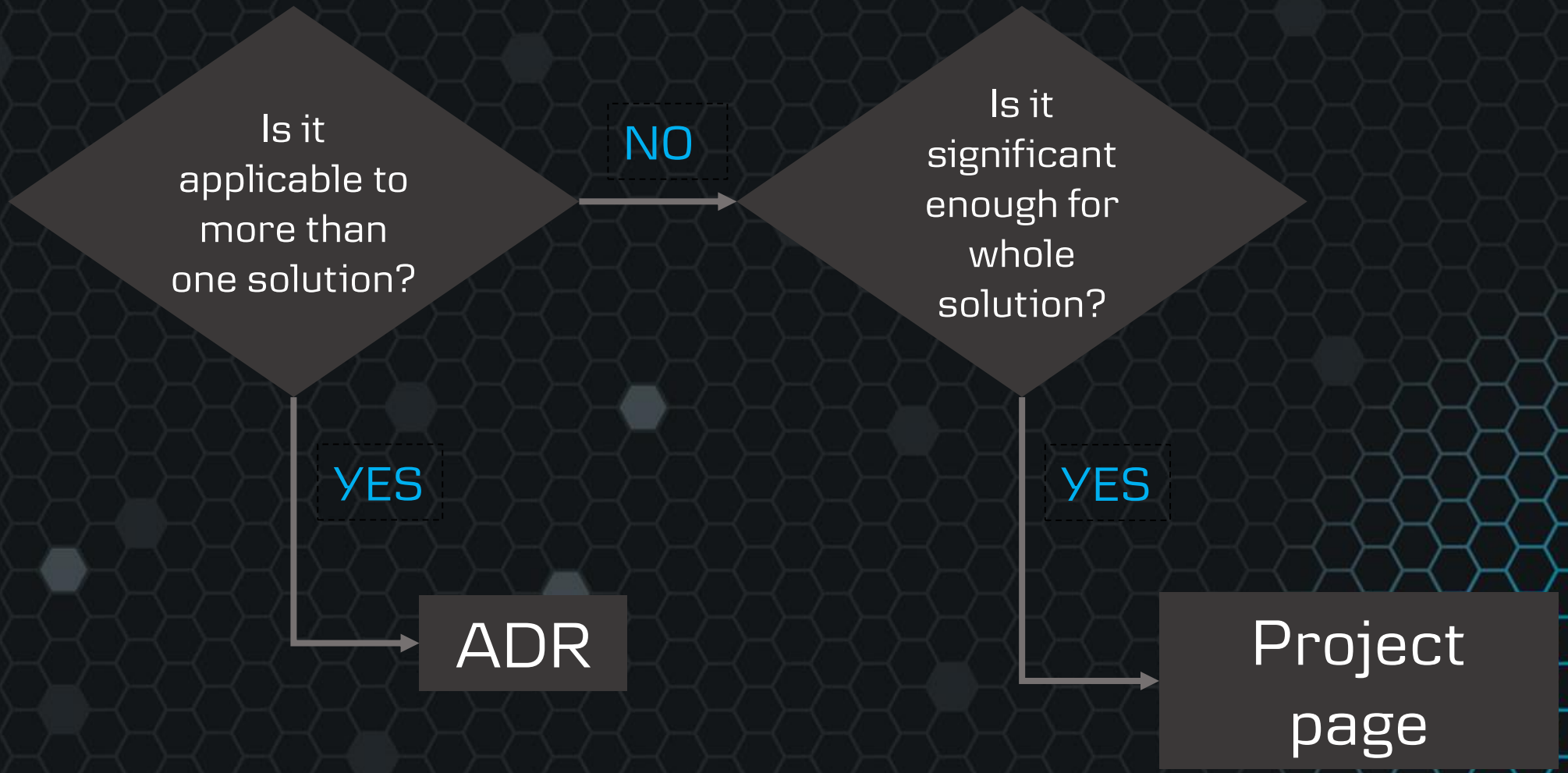

Project page and principles

Project page and principles

1. Contains business context and documentation of project

Project page and principles

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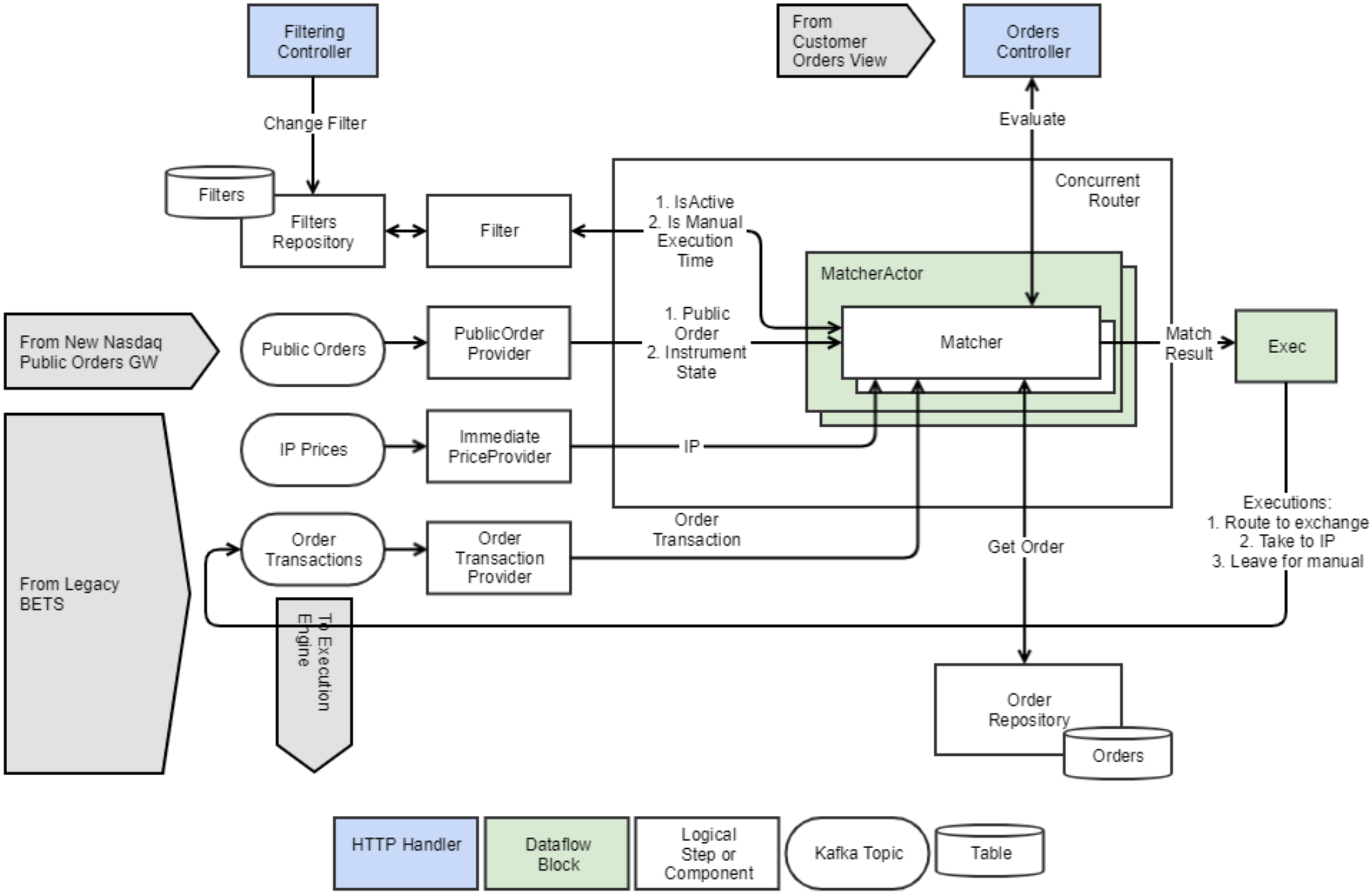
2. Tracks milestones and deadlines

Project page and principles

1. Contains business context and documentation of project
2. Tracks milestones and deadlines
3. Defines common project architecture (high level diagram)


Filtering Controller
Change Filter
Filters
Filters Repository
Filter
From Customer Orders View
Orders Controller
Evaluate
Concurrent Router
1. IsActive
2. Is Manual Execution Time
MatcherActor
Matcher
From New Nasdaq Public Orders GW
Public Orders
PublicOrder Provider
1. Public Order
2. Instrument State
Match Result
Exec
IP Prices
Immediate PriceProvider
IP
From Legacy BETS
Order Transactions
Order Transaction Provider
Order Transaction
Get Order
Executions:
1. Route to exchange
2. Take to IP
3. Leave for manual
To Execution Engine
Order Repository
Orders
HTTP Handler
Dataflow Block
Logical Step or Component
Kafka Topic
Table

Project page and principles

1. Contains business context and documentation of project
2. Tracks milestones and deadlines
3. Defines common project architecture (high level diagram)
4. Facilitates communication between stakeholders

Project page and principles

1. Contains business context and documentation of project
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4. Facilitates communication between stakeholders
5. Owned by Project Lead

Project Lead

Project Lead

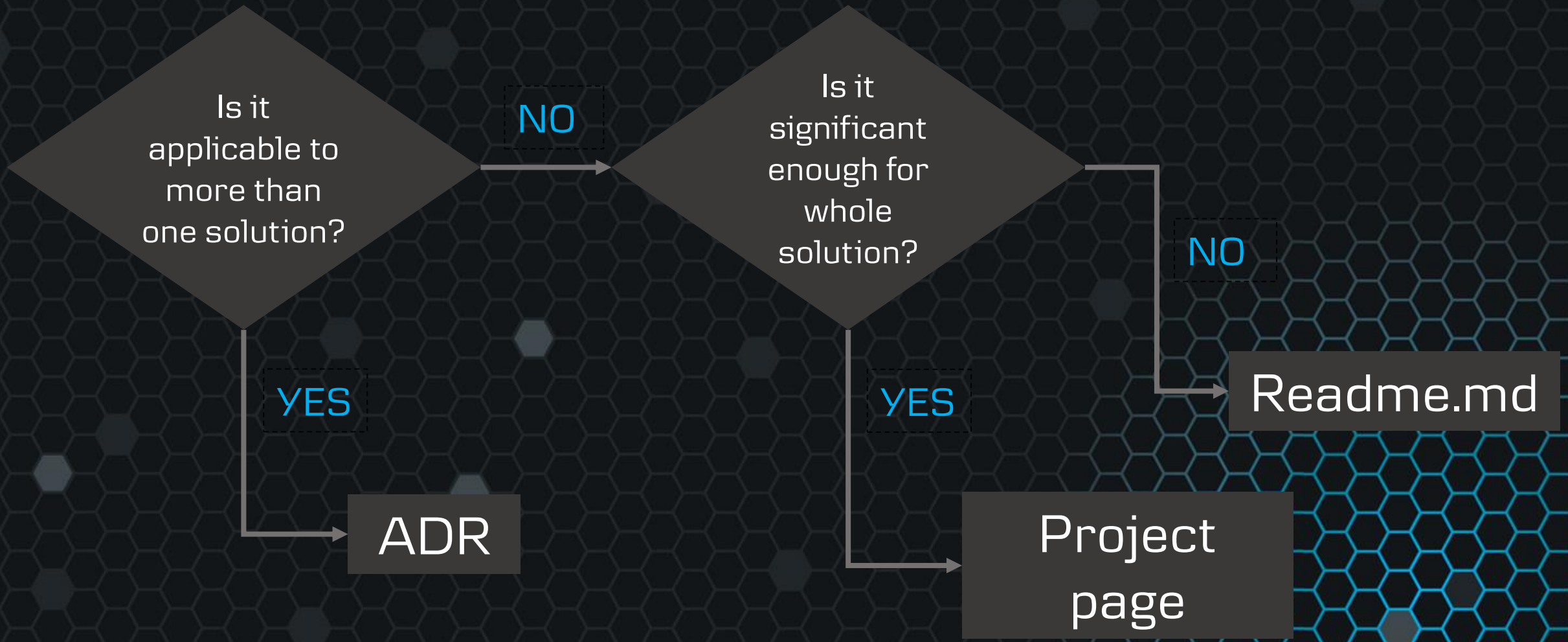
Project Lead

Project Lead

Project page and principles

1. Contains business context and documentation of project
2. Tracks milestones and deadlines
3. Defines common project architecture (high level diagram)
4. Facilitates communication between stakeholders
5. Owned by Project Lead
6. Must be created prior to project kick-off

Picking decision record



Readme.md

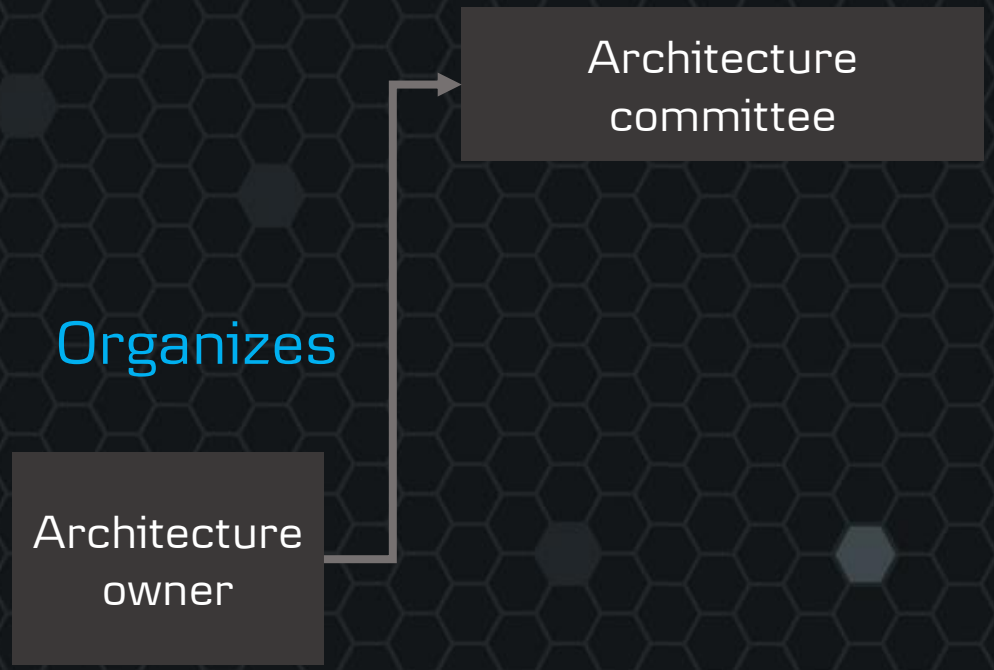
1. Has maintainer(-s) defined
2. Describes architecture and design
3. ...

Architecture definition pattern

Architecture definition pattern

Architecture owner

Architecture definition pattern



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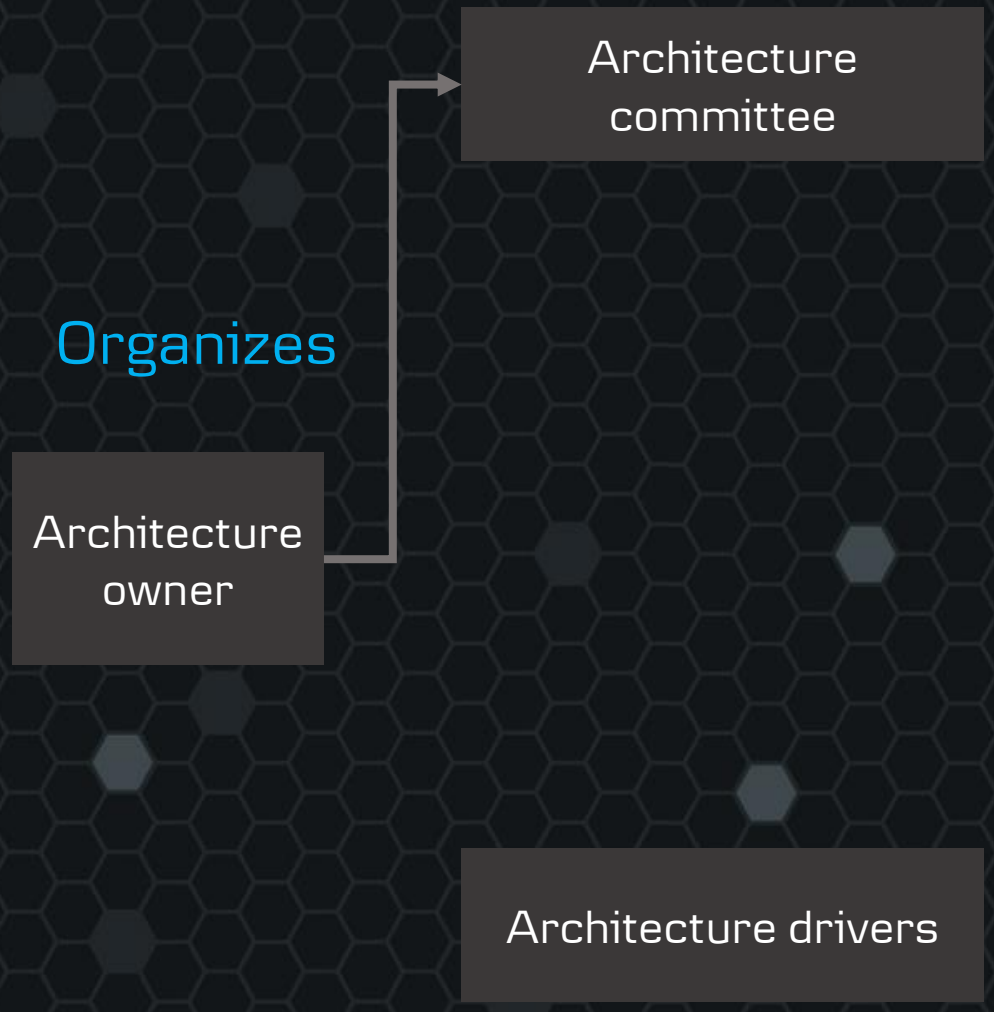

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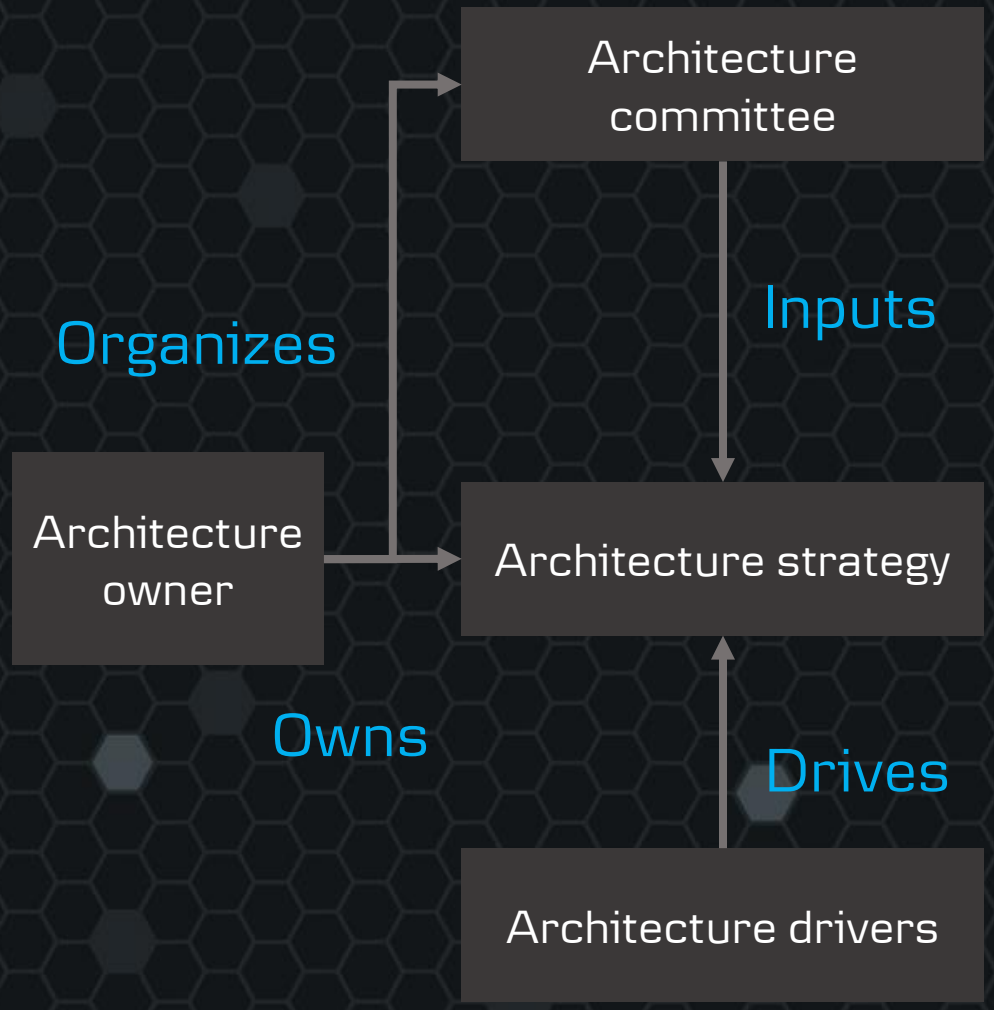

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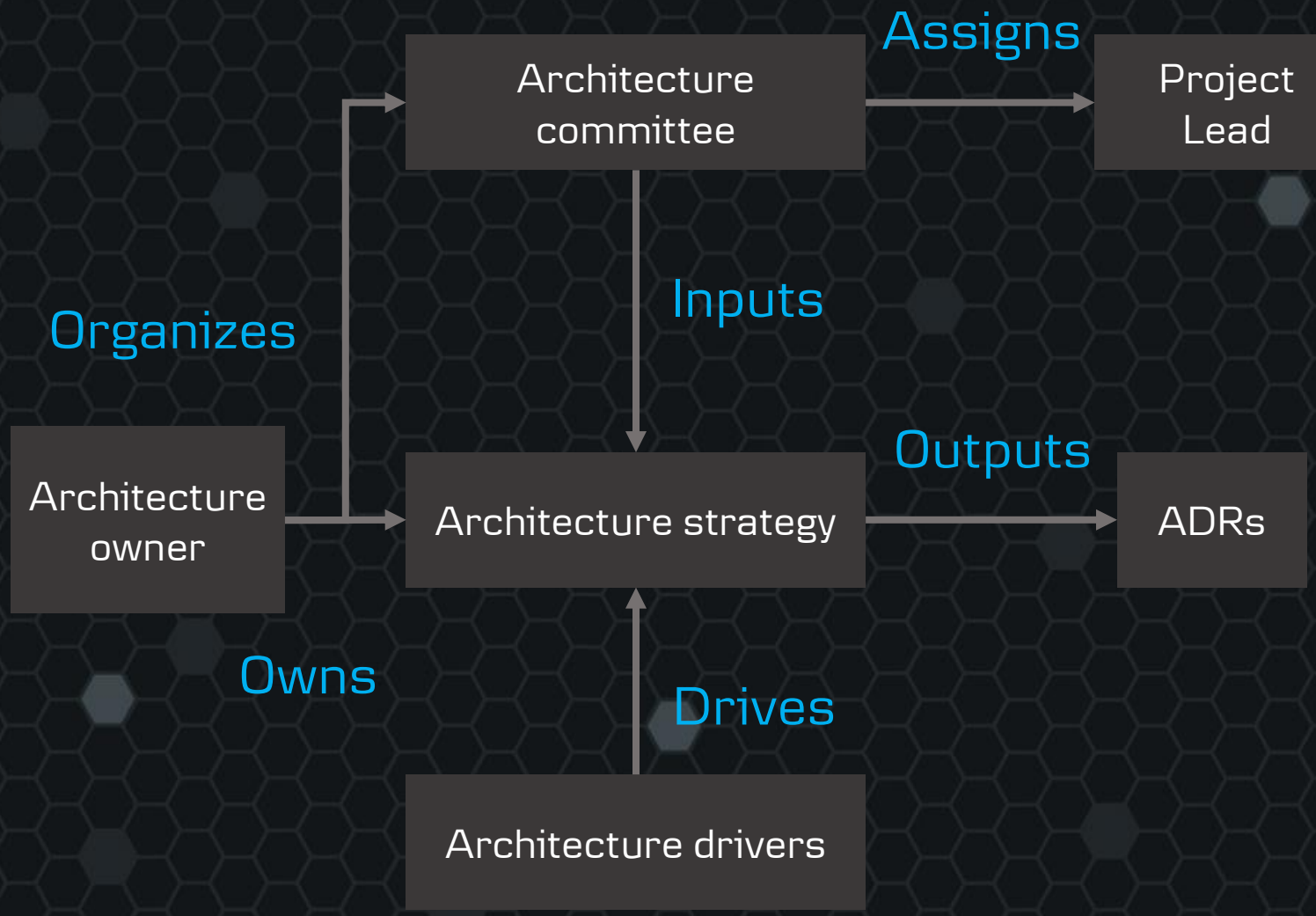

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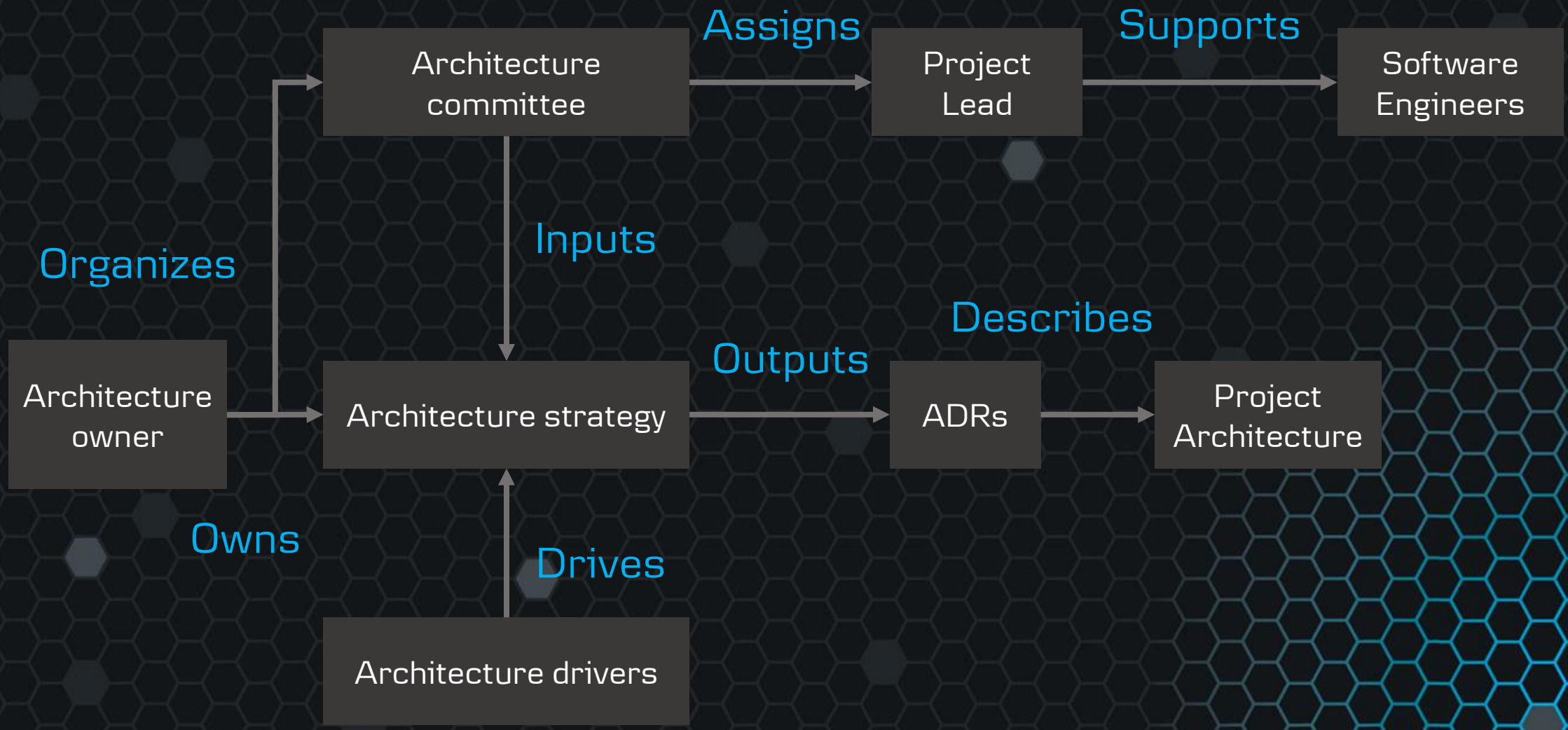

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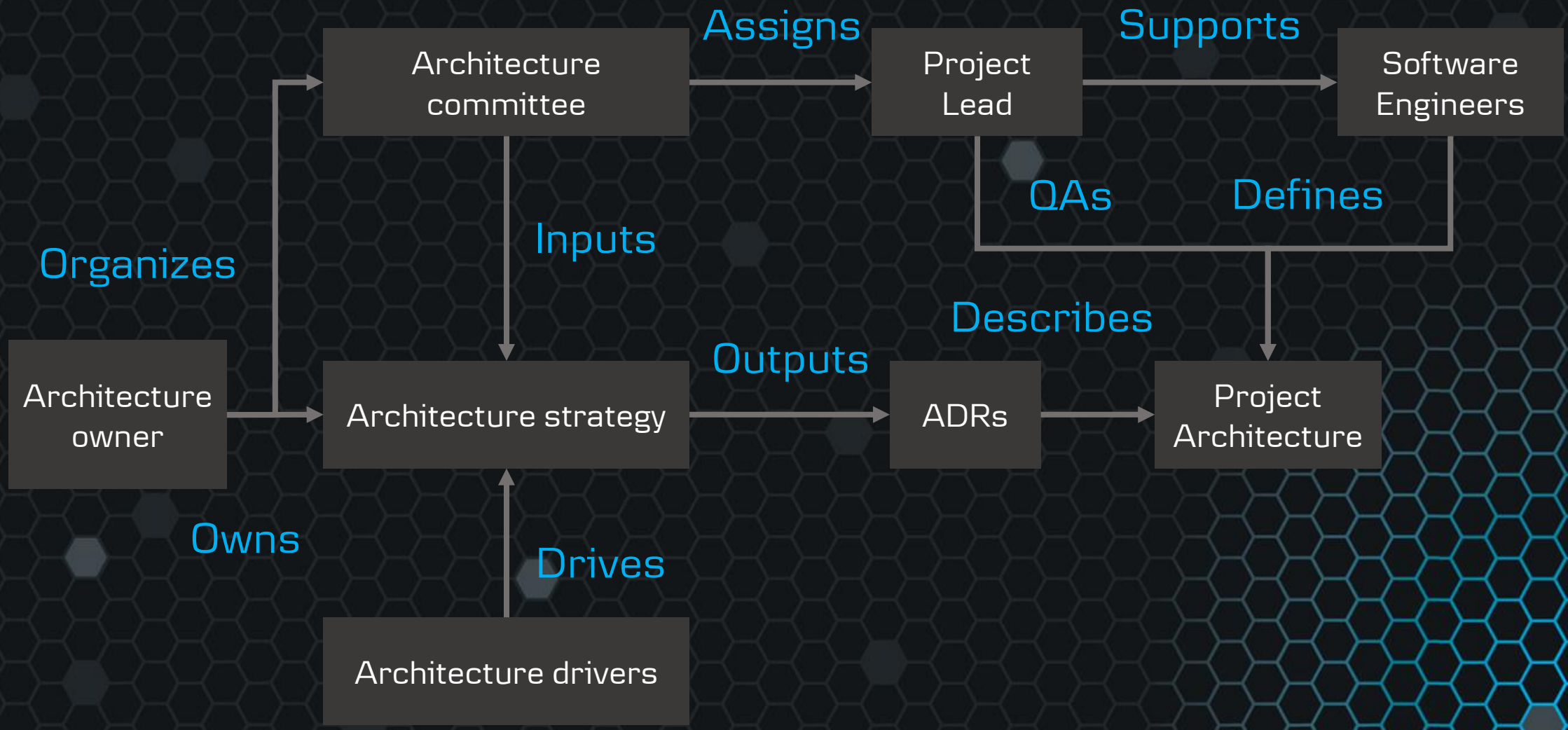

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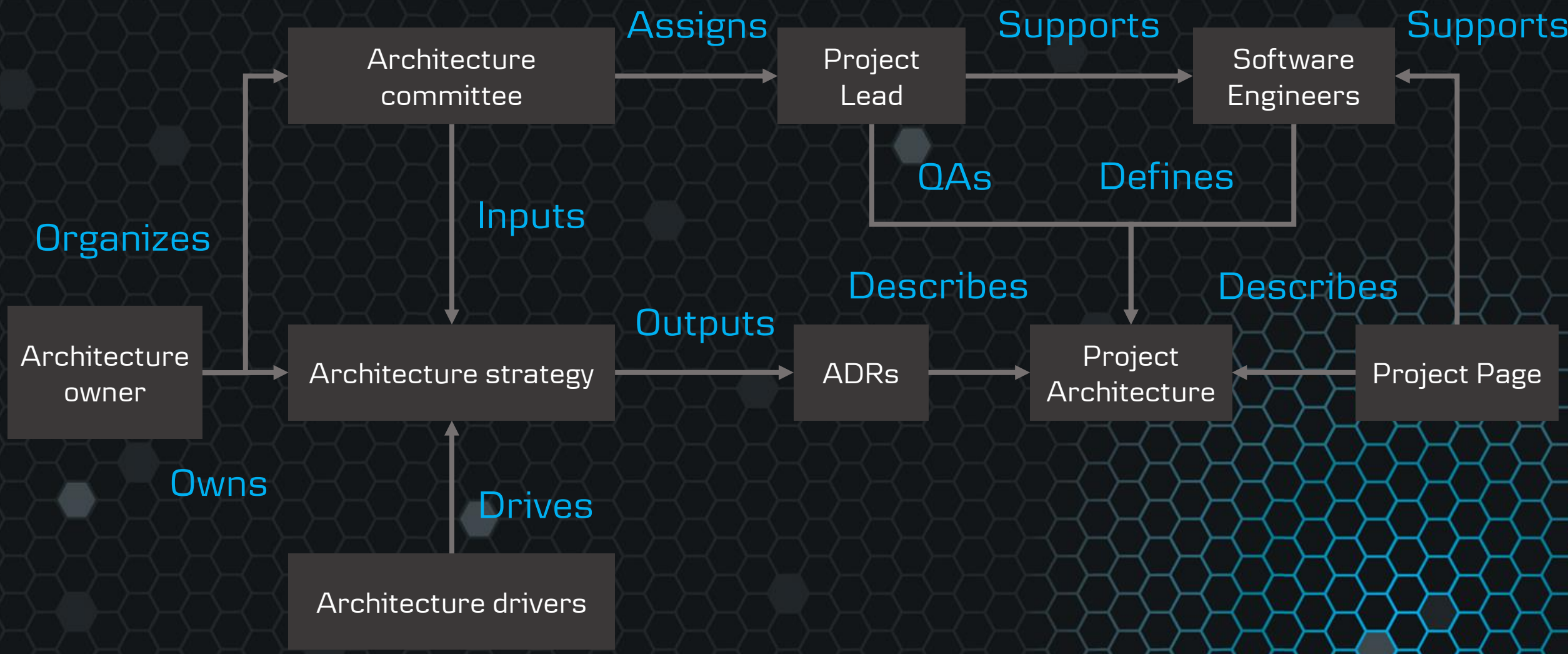

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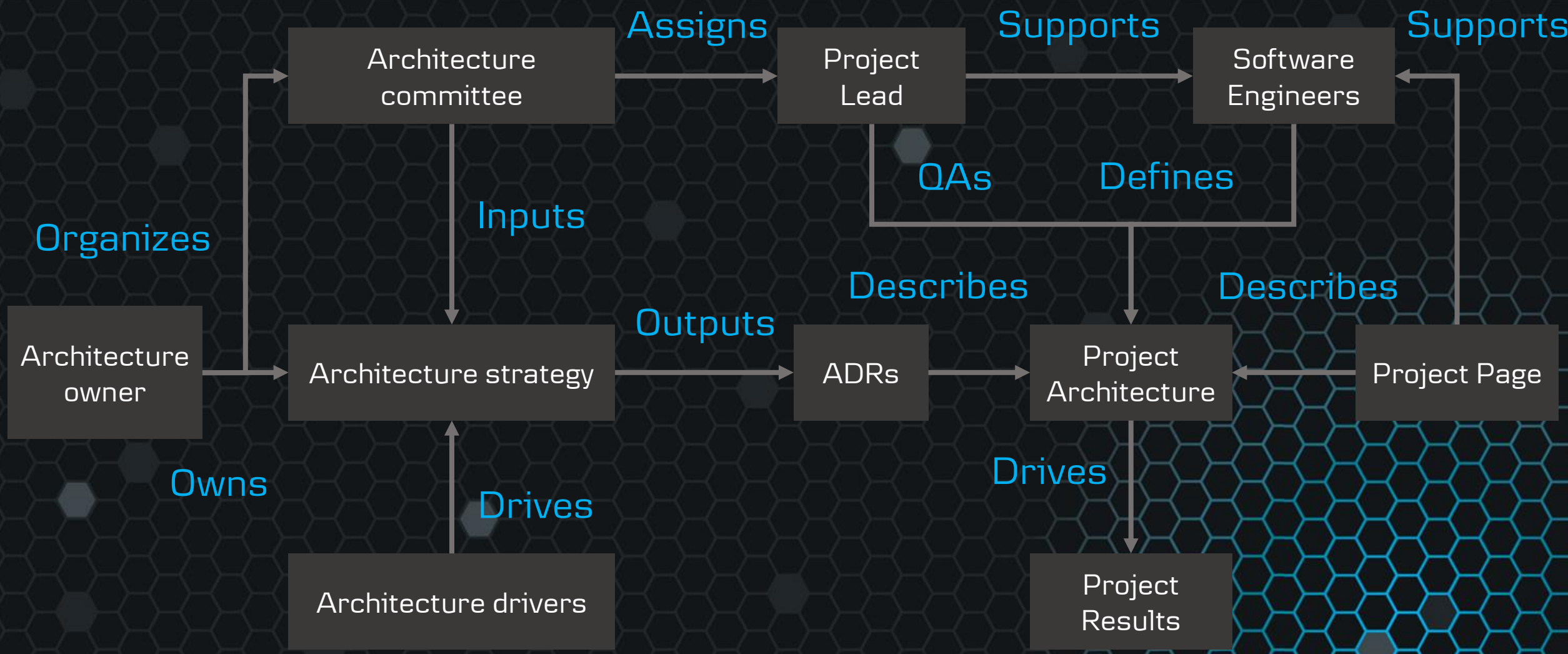

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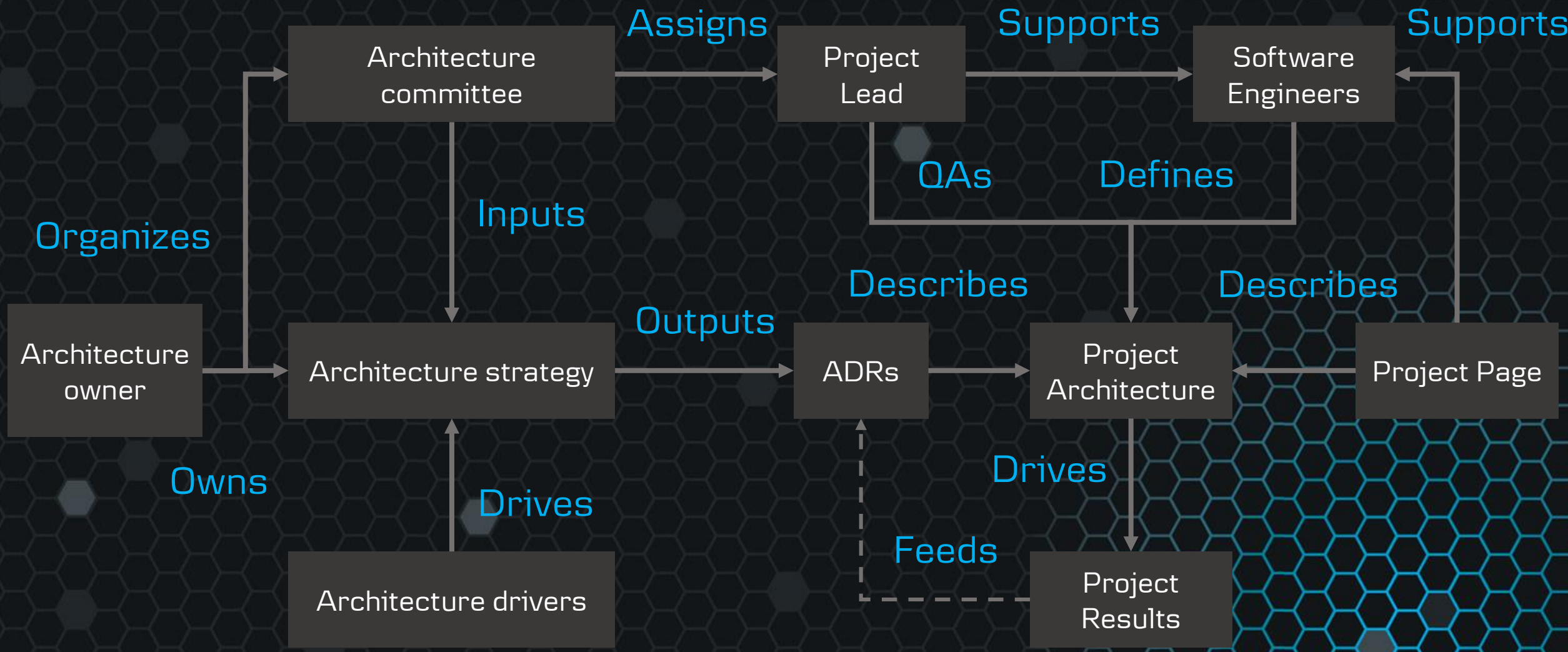

Caveats discovered underway

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1. Priority set as important but not urgent

Caveats discovered underway

1. Priority set as important but not urgent
2. Lack of transparency

Caveats discovered underway

1. Priority set as important but not urgent
2. Lack of transparency
3. Scope management

Caveats discovered underway

1. Priority set as important but not urgent
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4. Indecisiveness

Caveats discovered underway

1. Priority set as important but not urgent
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5. D-word

Questions