

DOMAIN-CENTRIC?

WHY HEXAGONAL AND ONION ARCHITECTURE ARE ANSWERS TO THE WRONG QUESTION — AND WHAT TO ASK INSTEAD

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github.com/odrotbohm

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Oliver Drotbohm

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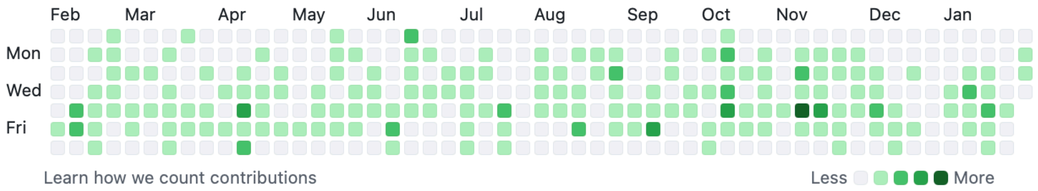
1,717 contributions in the last year



Learn how we count contributions

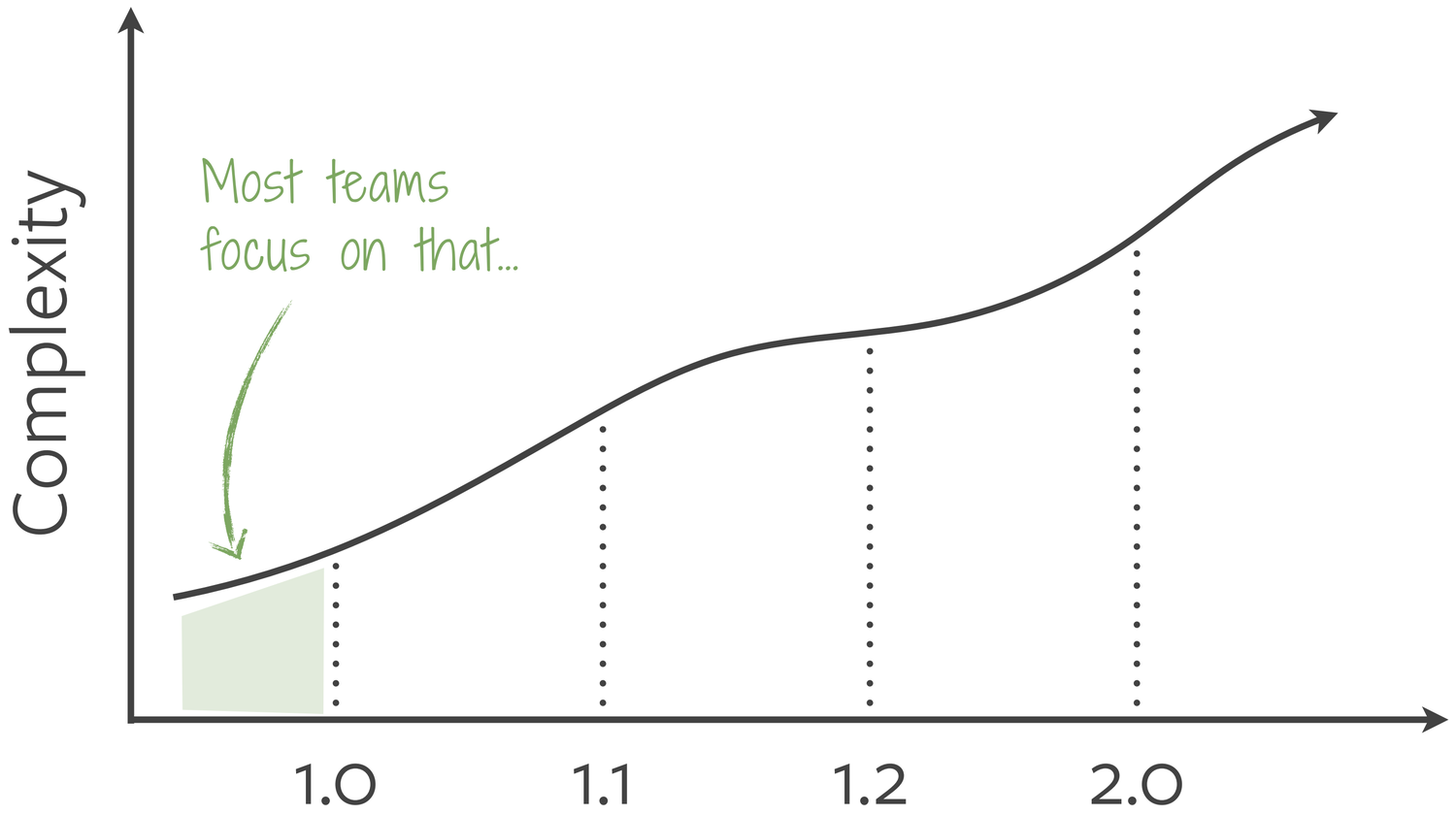
Less More

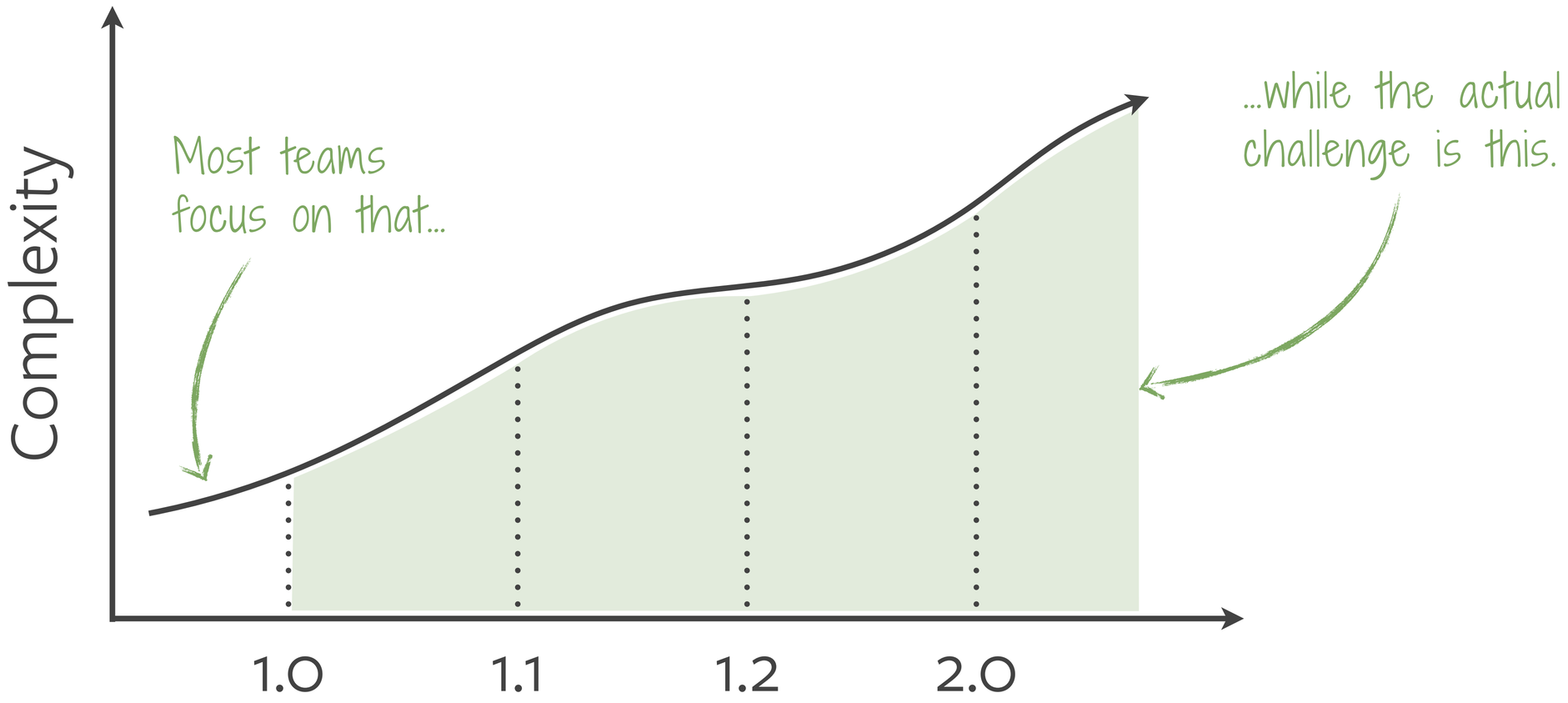
2026 2025 2024 2023 2022 2021 2020

@spring-projects @xmolecules @spring-io More

Activity overview

Code review

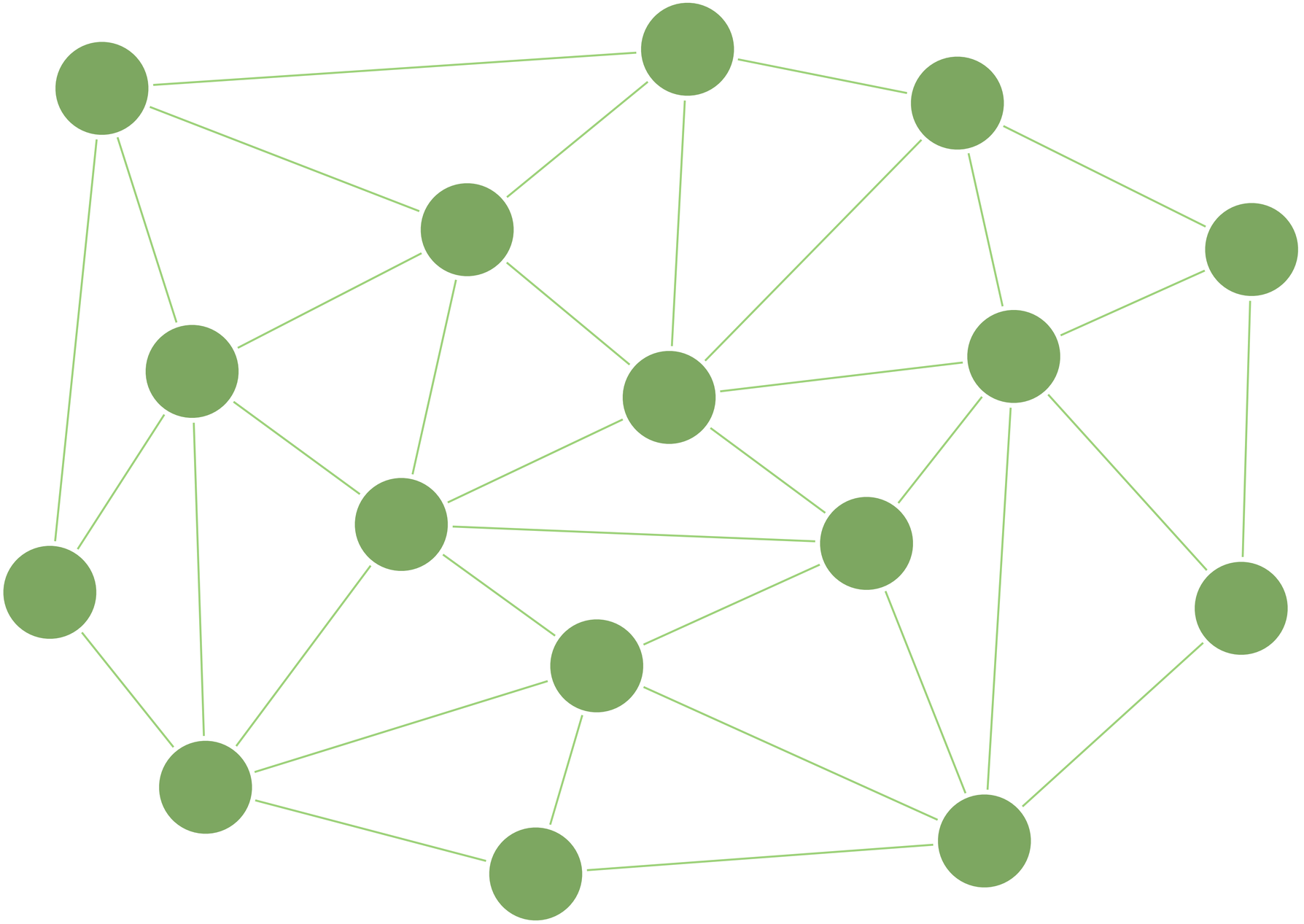

Complexity
Most teams
focus on that...
1.0
1.1
1.2
2.0

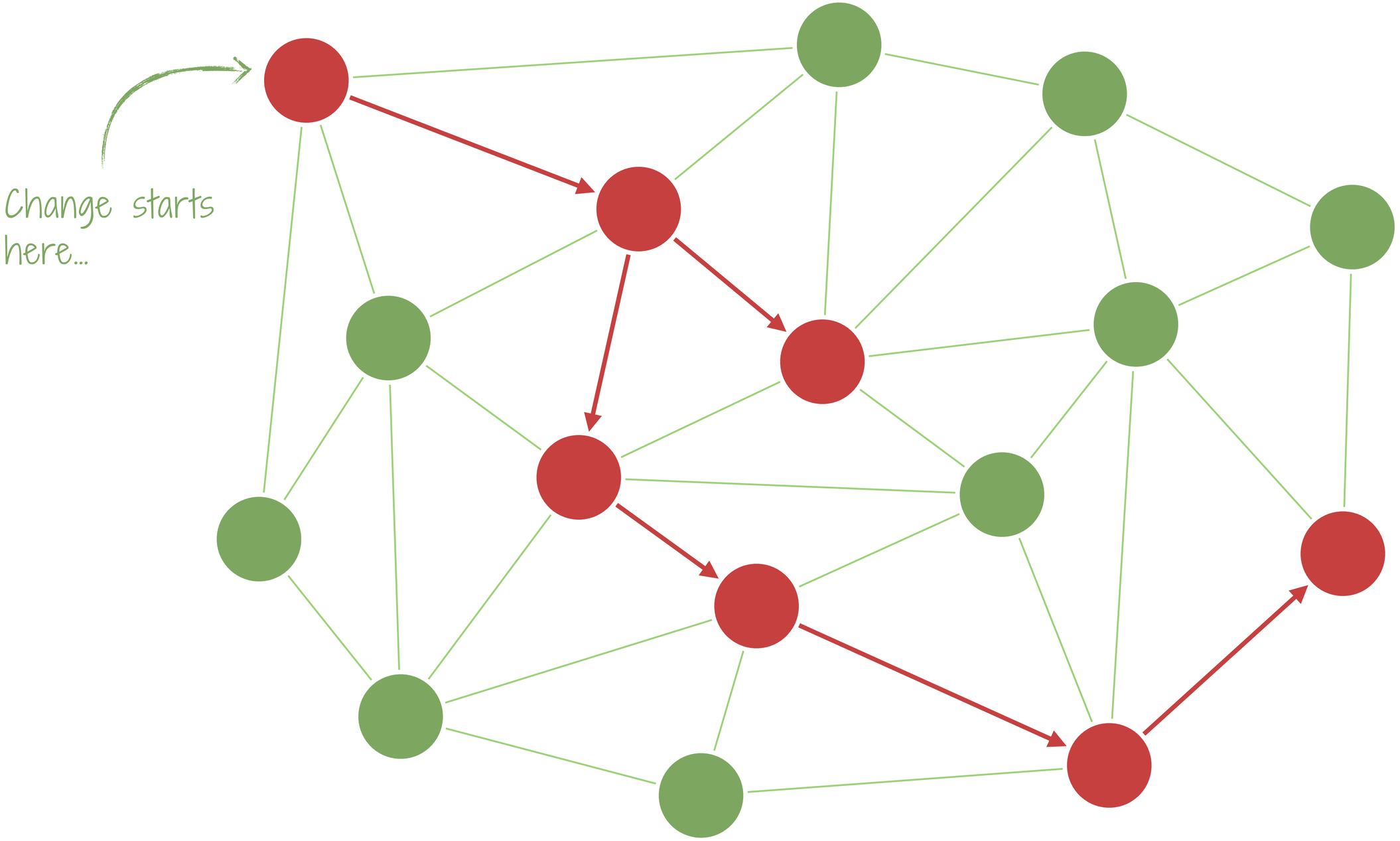

Complexity
Most teams
focus on that...
...while the actual
challenge is this.
1.0
1.1
1.2
2.0

Cost of Software
≈
Cost of Change

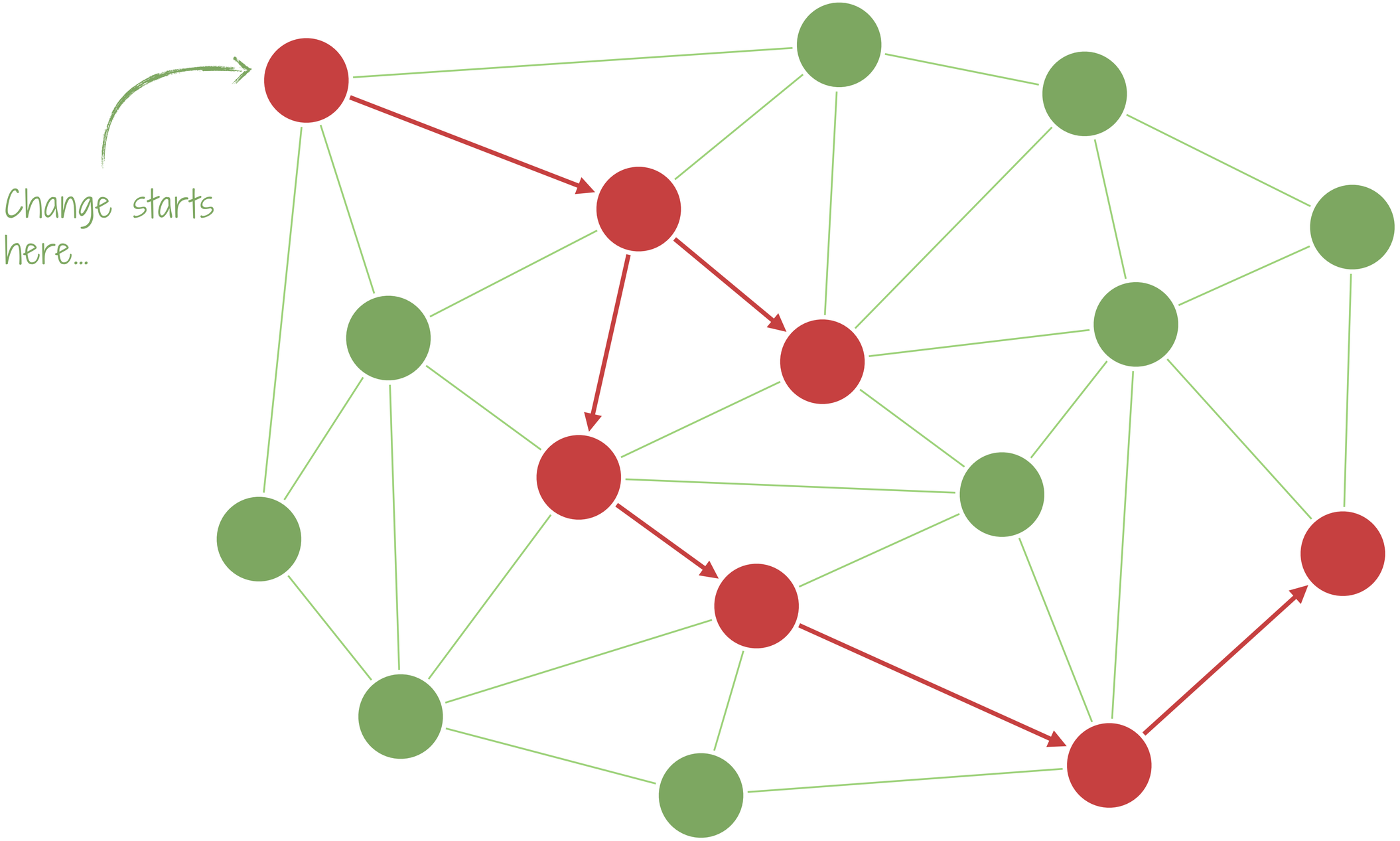
Beck - A Daily Practice of Empirical Software Design — https://www.youtube.com/watch?v=yBEcq23OgB4 (2023)
Yourdon, Constantine - Structured Design — Fundamentals of a Discipline of Computer Program and Systems Design (1979)

Cost of Change
≈
Coupling

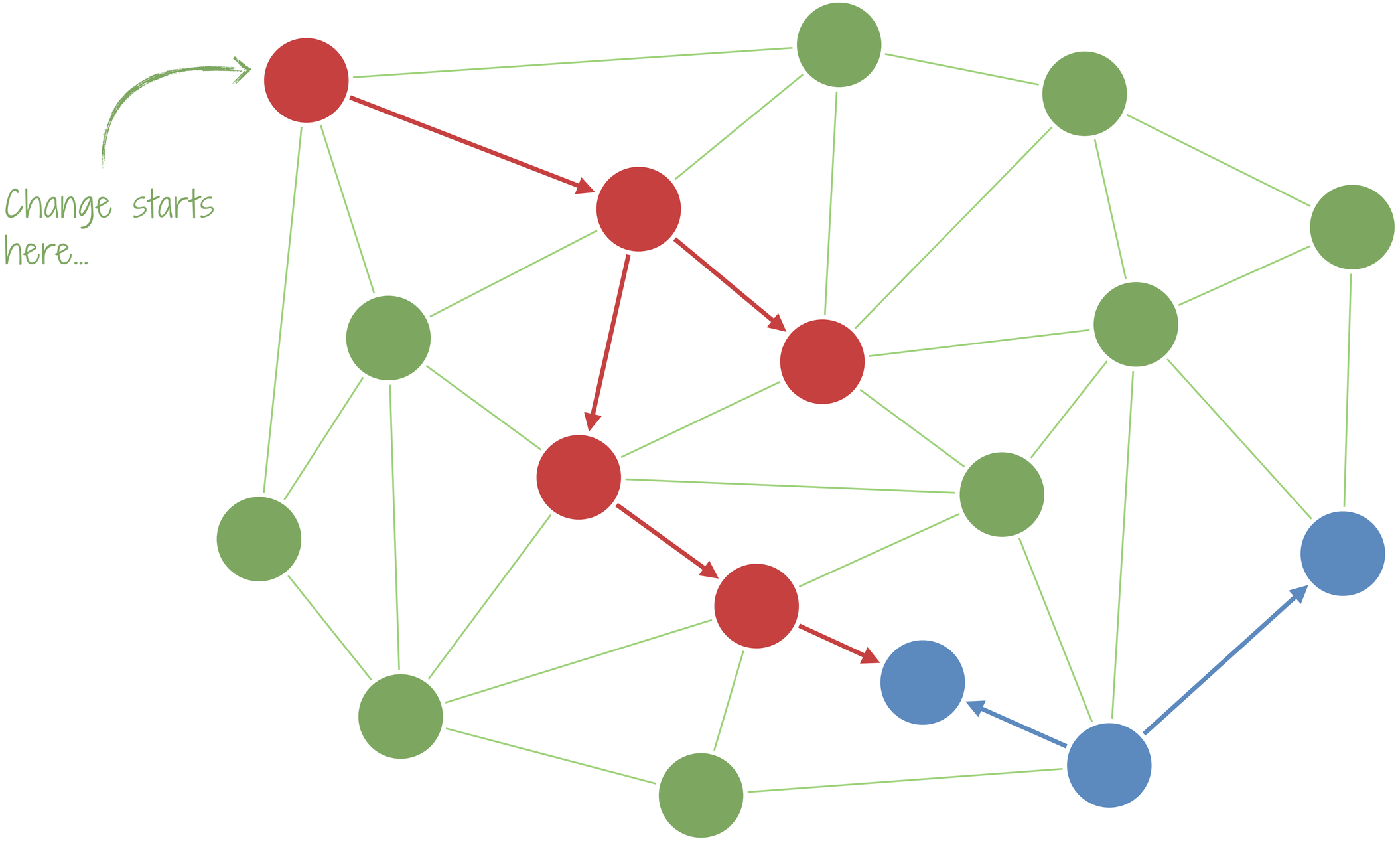



Change starts here...

Not all coupling is born equal


Change starts here...

Decoupling has its cost, too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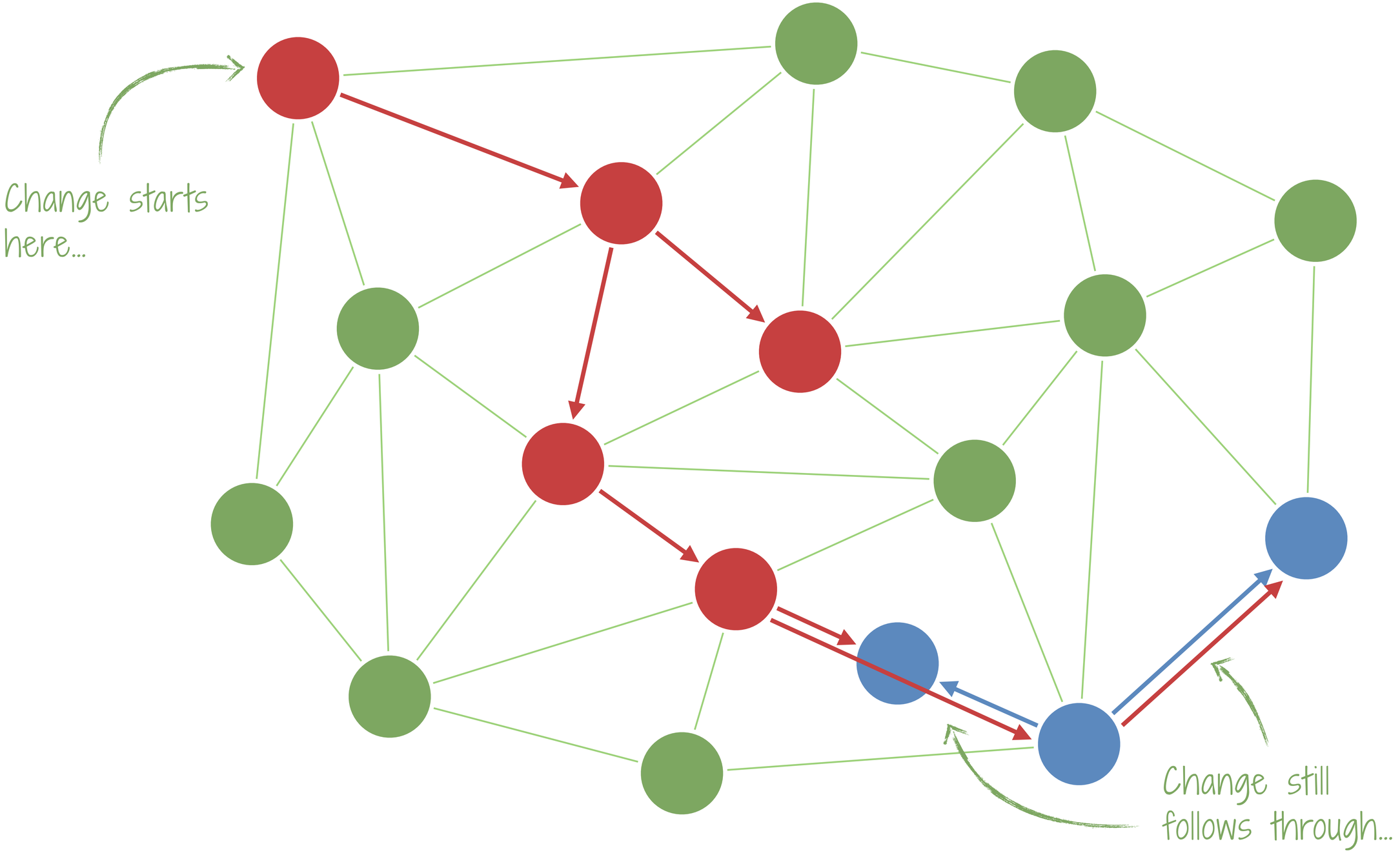
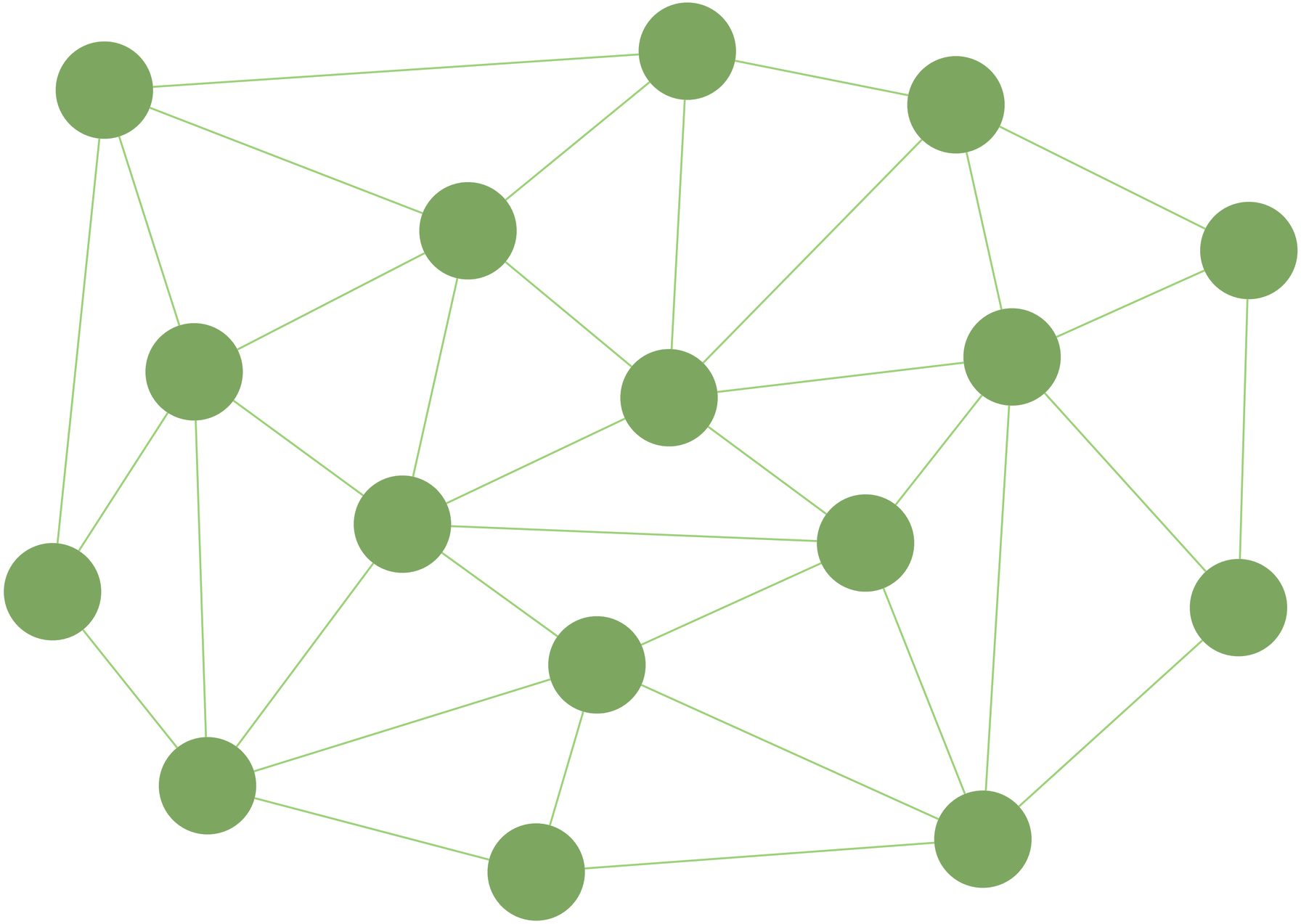
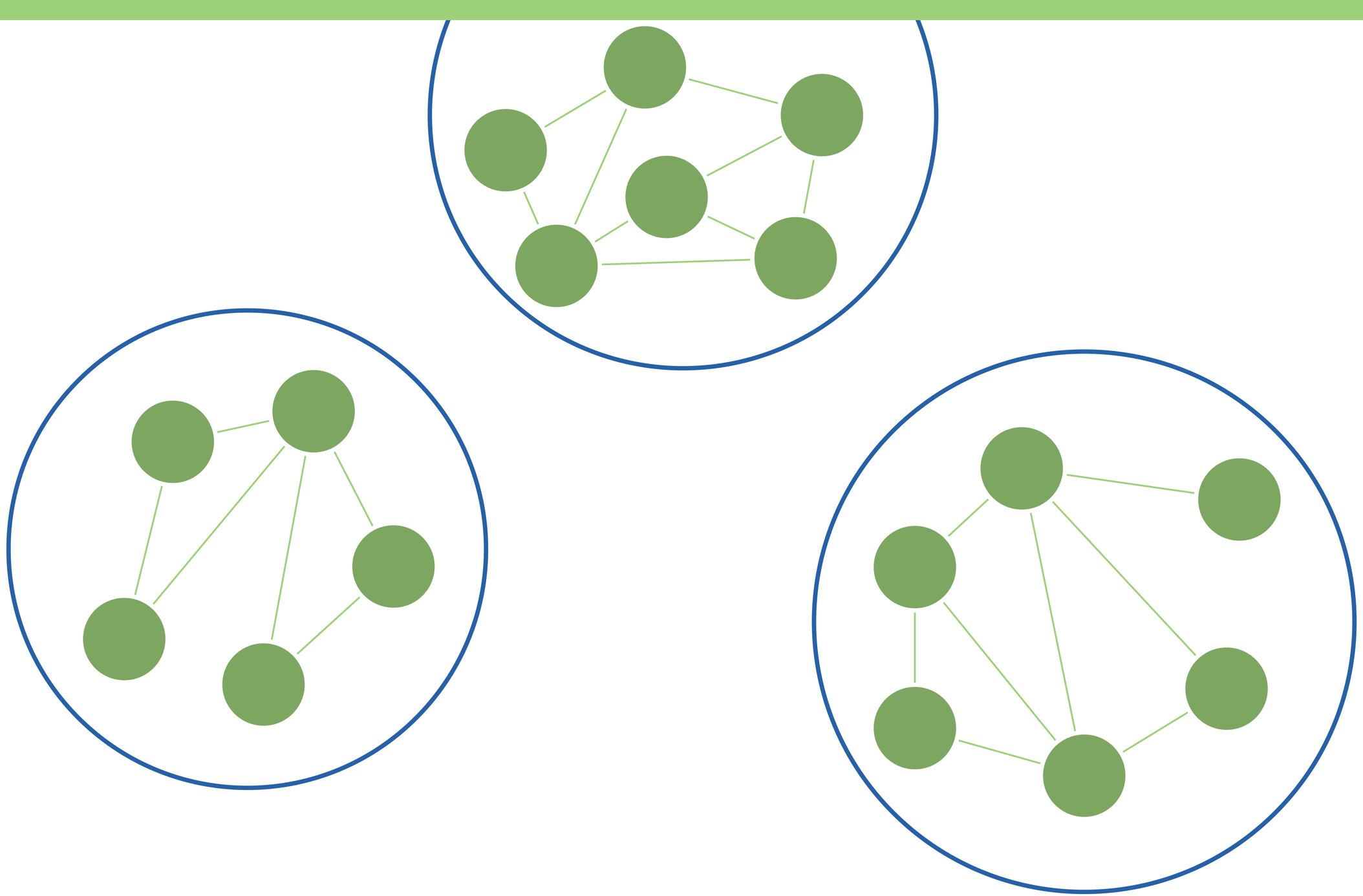

Change starts here...
Change still follows through...

Cohesion

Cohesion is coupling in the right™ places





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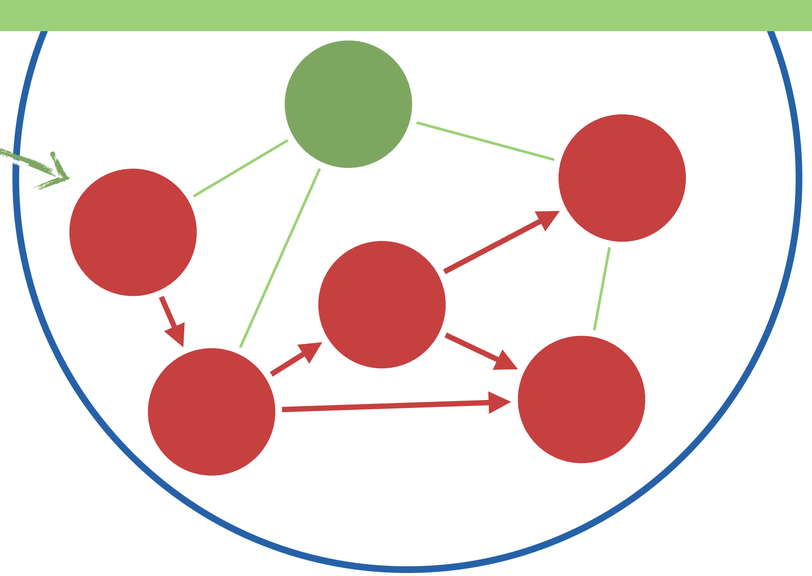

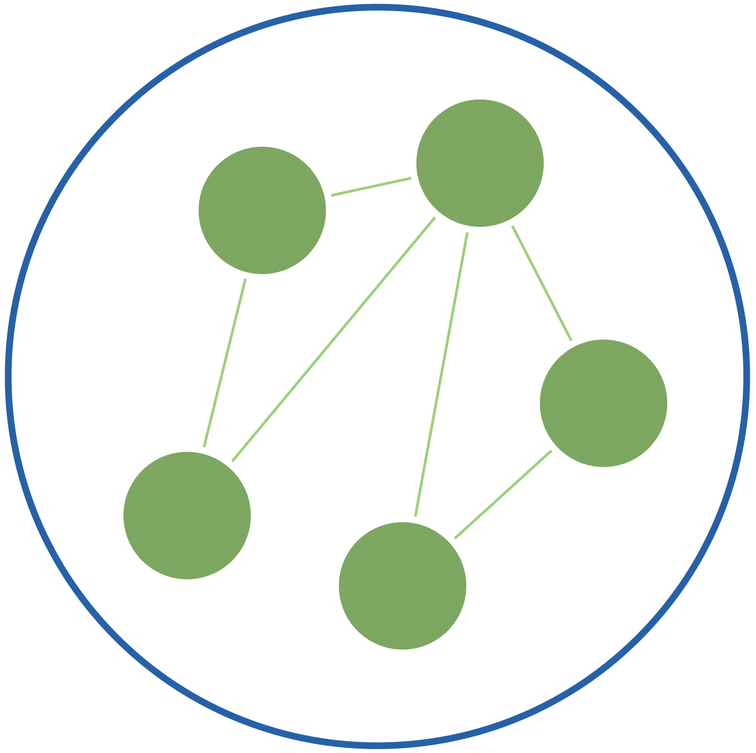

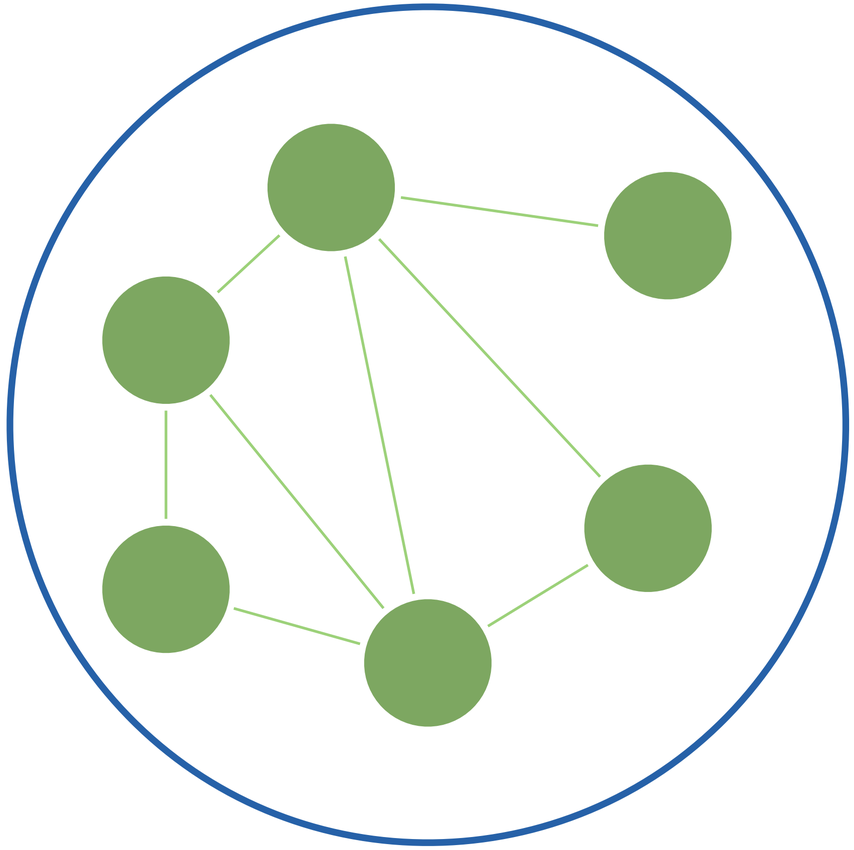



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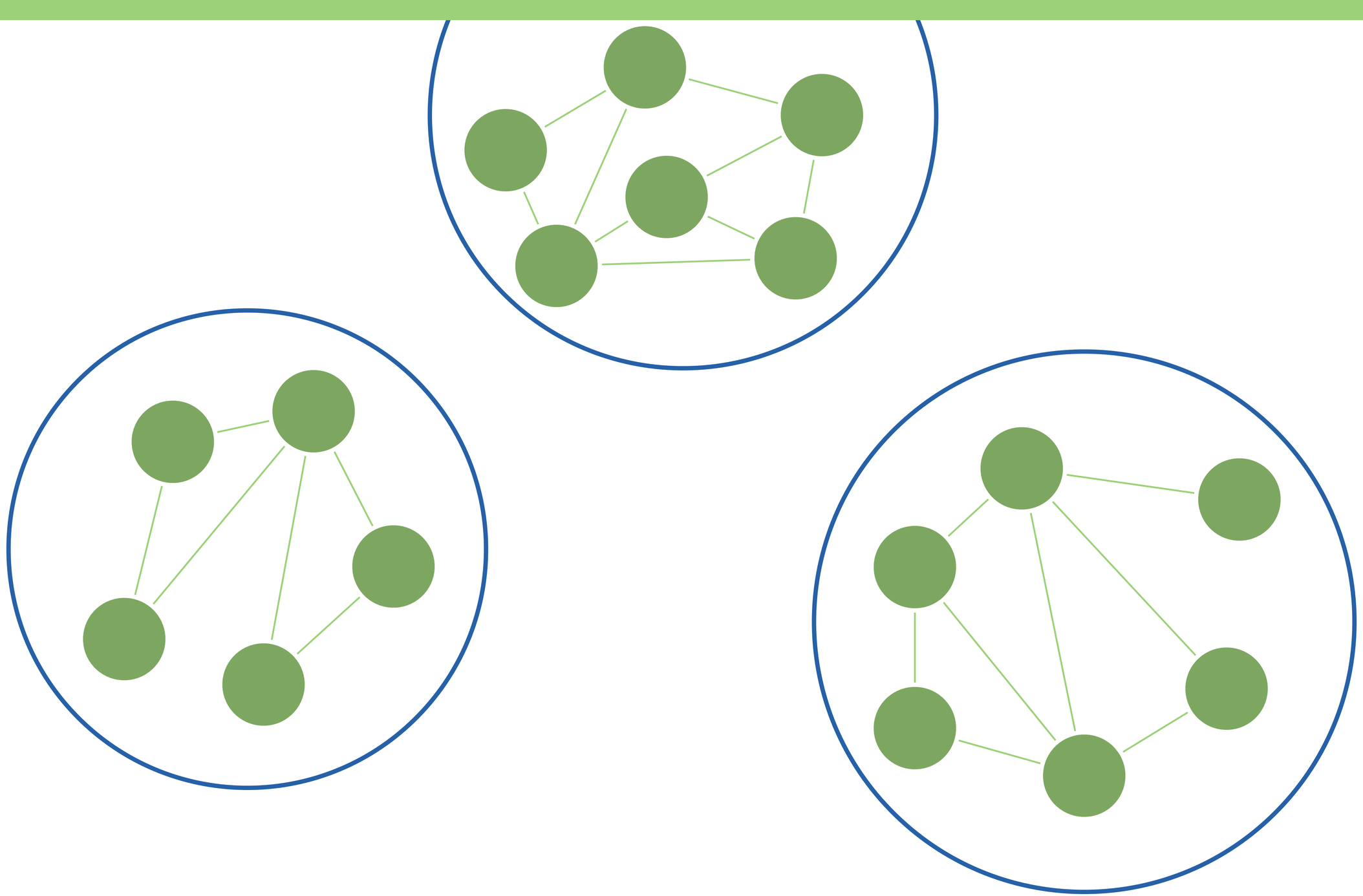
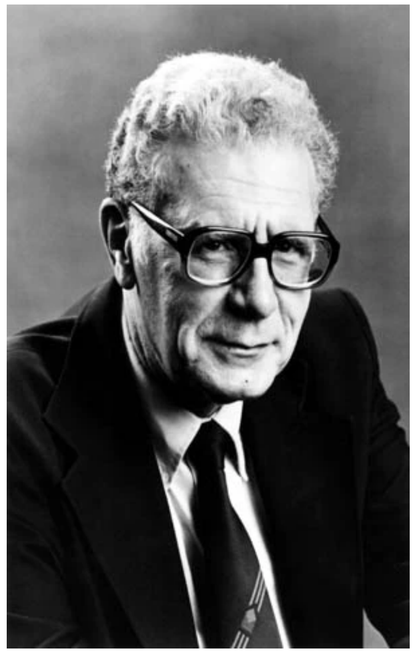
A software system's structure is essentially a formalized bet on change patterns you anticipate having to deal with in the future.

14. Jan. 2025, 11:55 · · Ivory for Mac

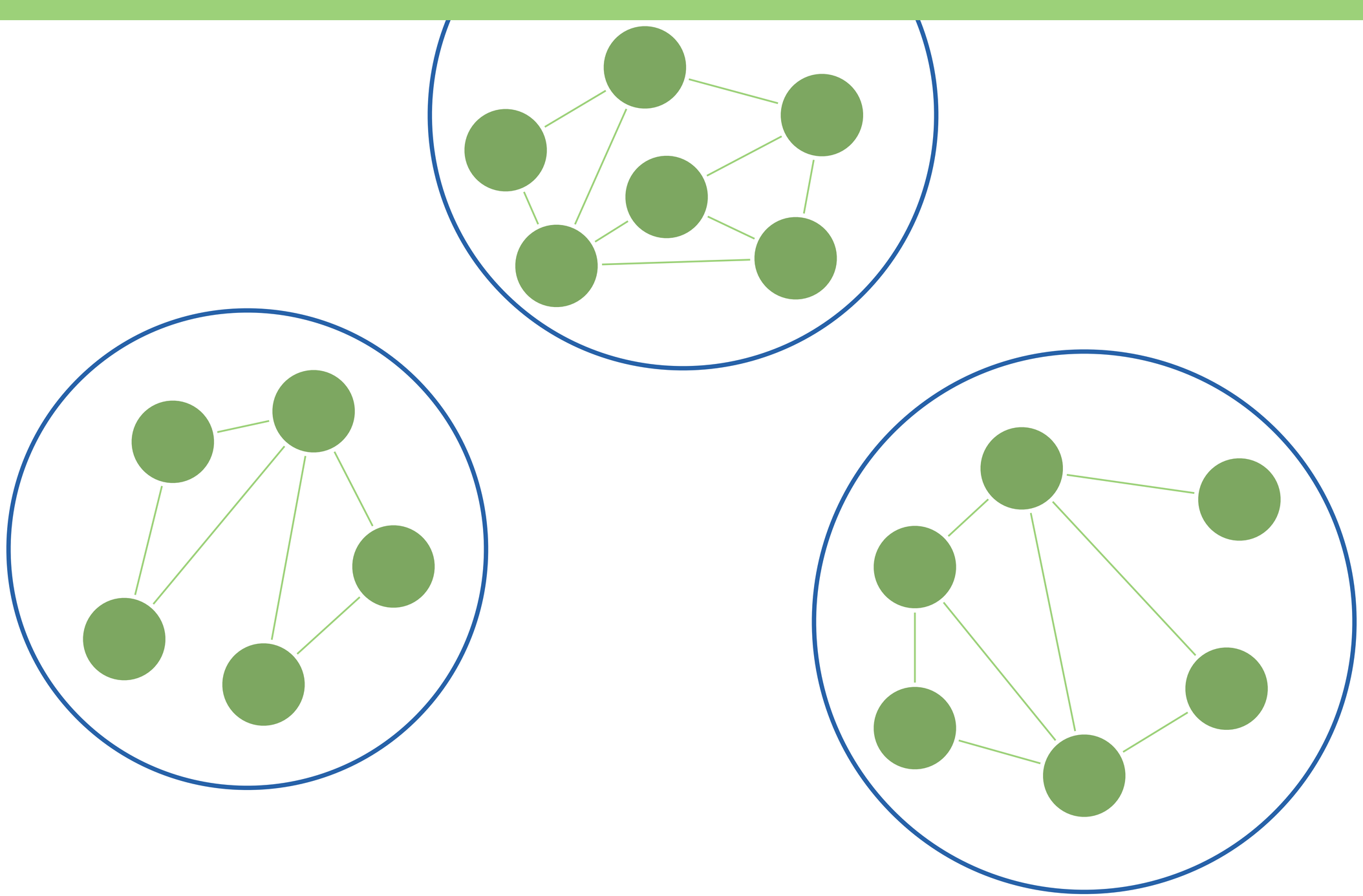
https://chaos.social/@odrotbohm/113826340530554922

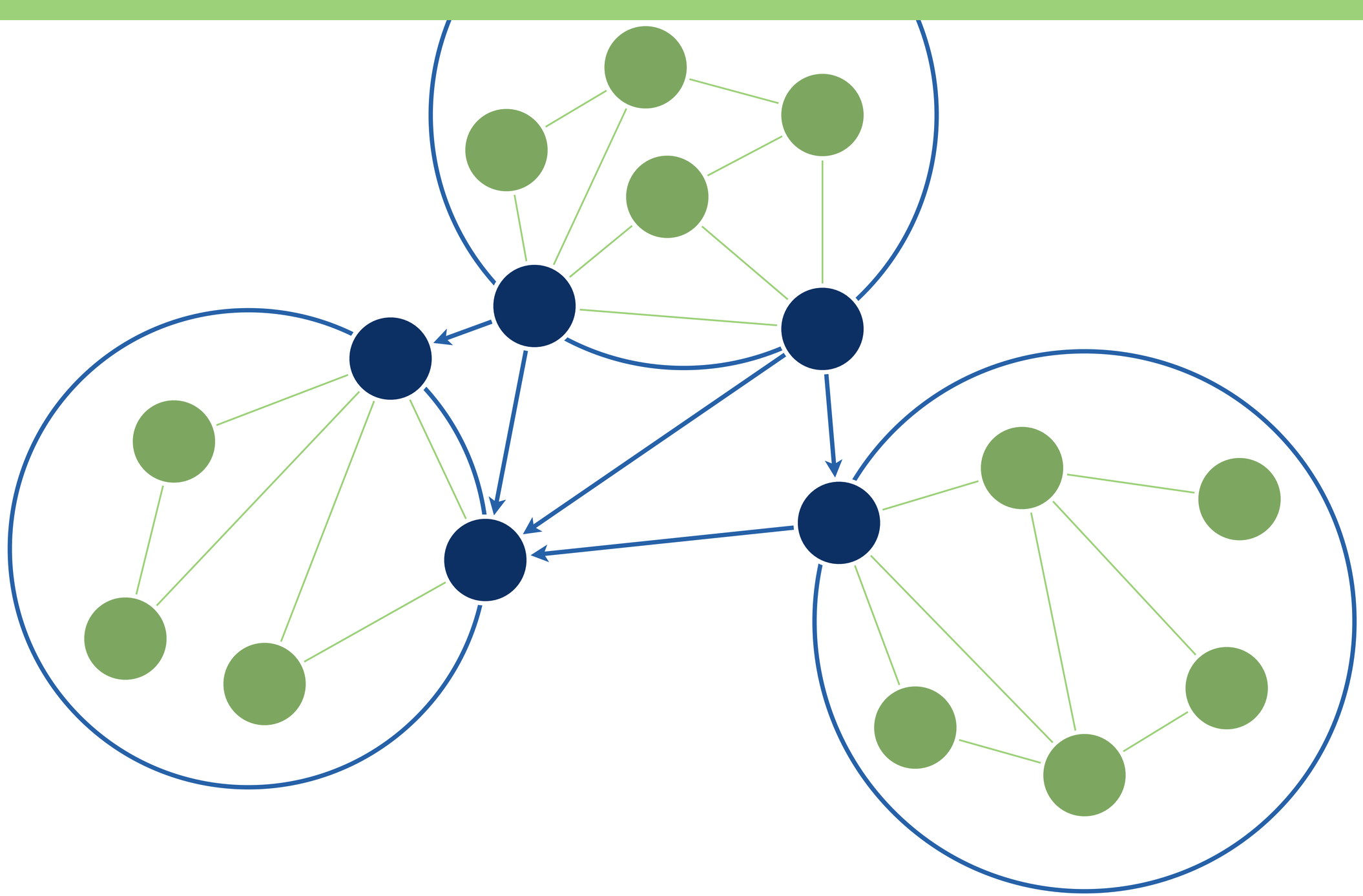




”A system is never the sum of its *parts*, it’s the product of their *interactions*.”

— Russel L. Ackoff



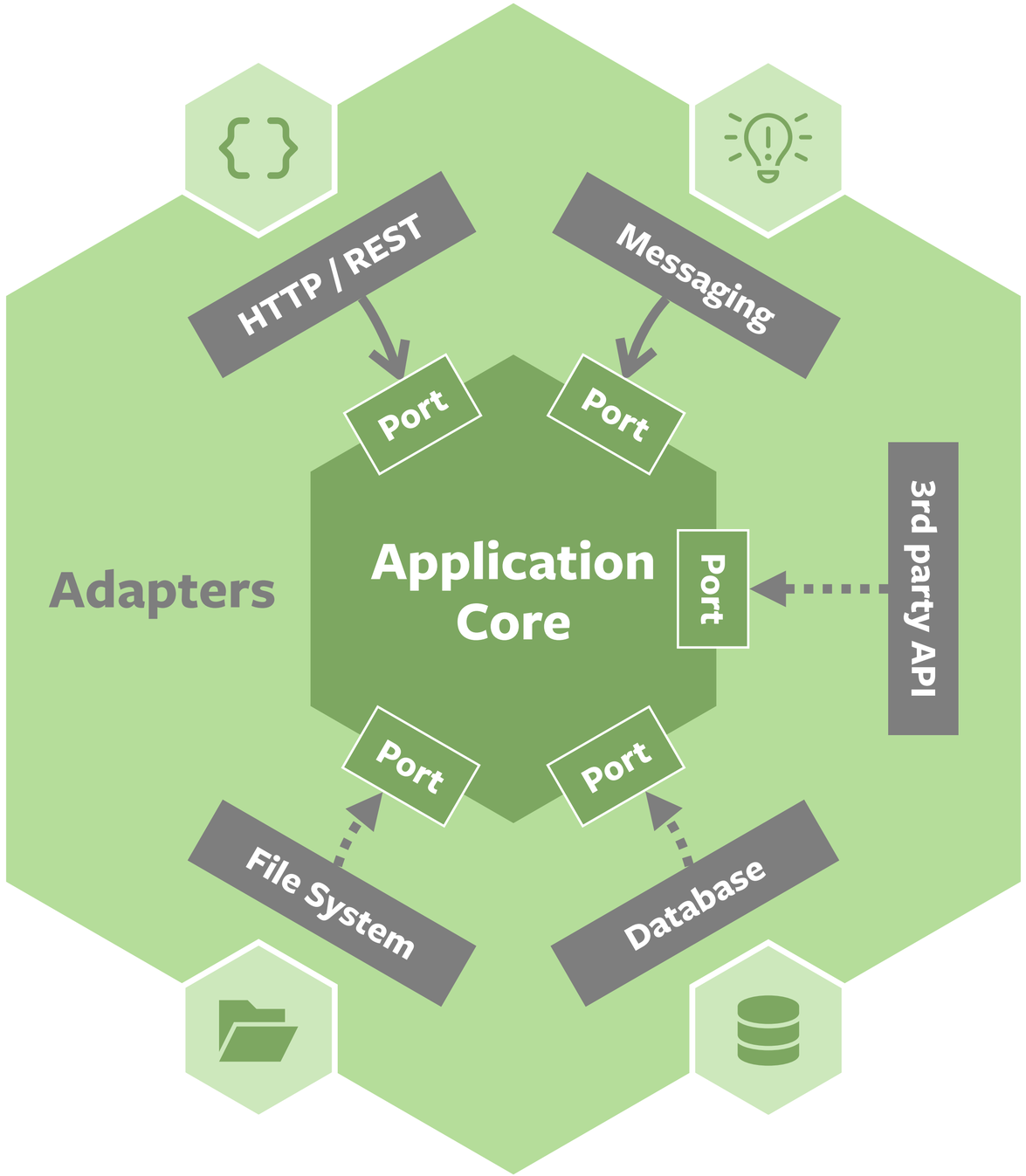


Software design is the act of modeling units of strong cohesion, loosely coupled to each other.

Separation of Concerns Architectures

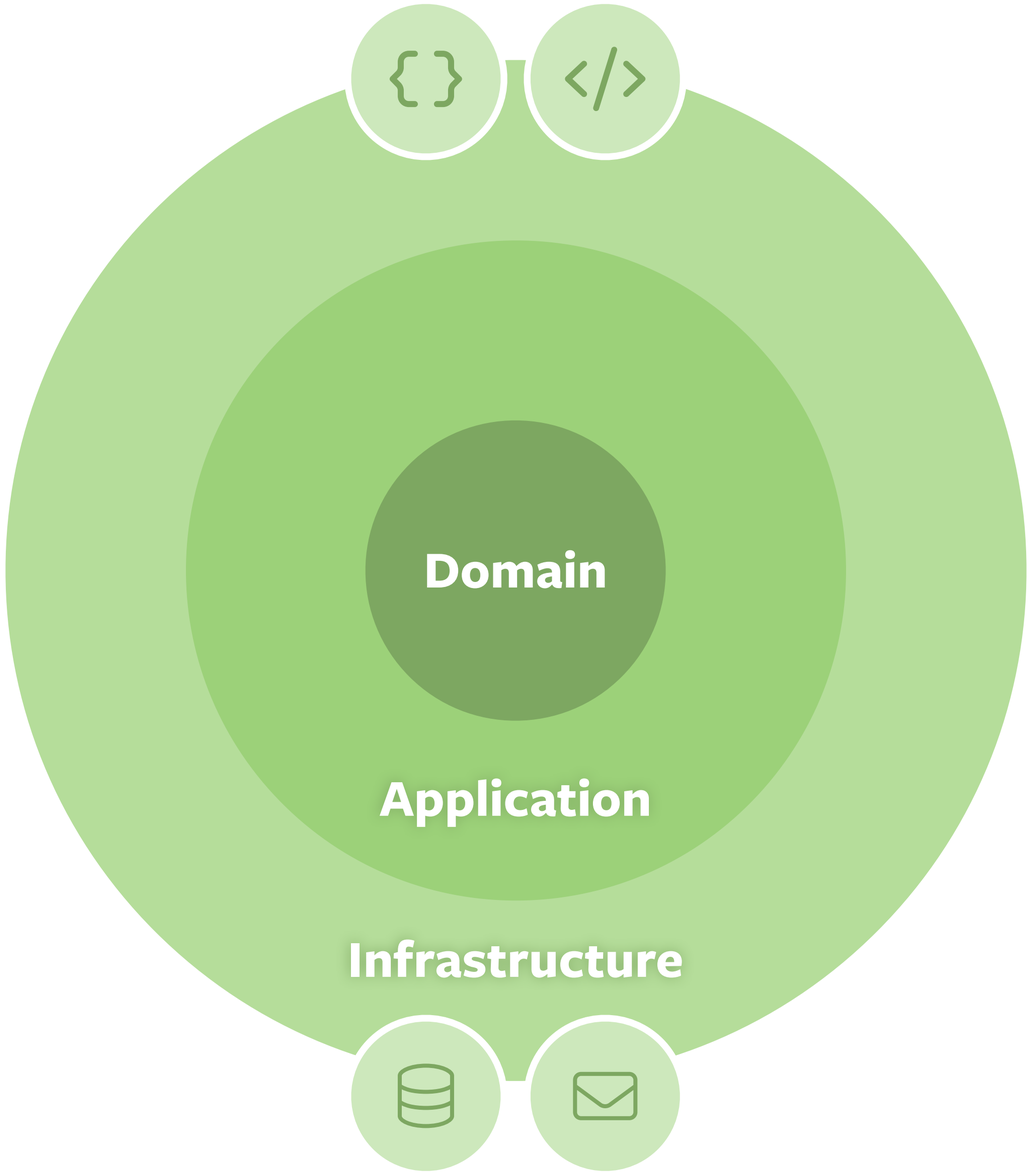
Hexagonal Architecture

2005


HTTP / REST
Messaging
Port
Port
Adapters
Application Core
Port
3rd party API
Port
Port
File System
Database

Onion Architecture

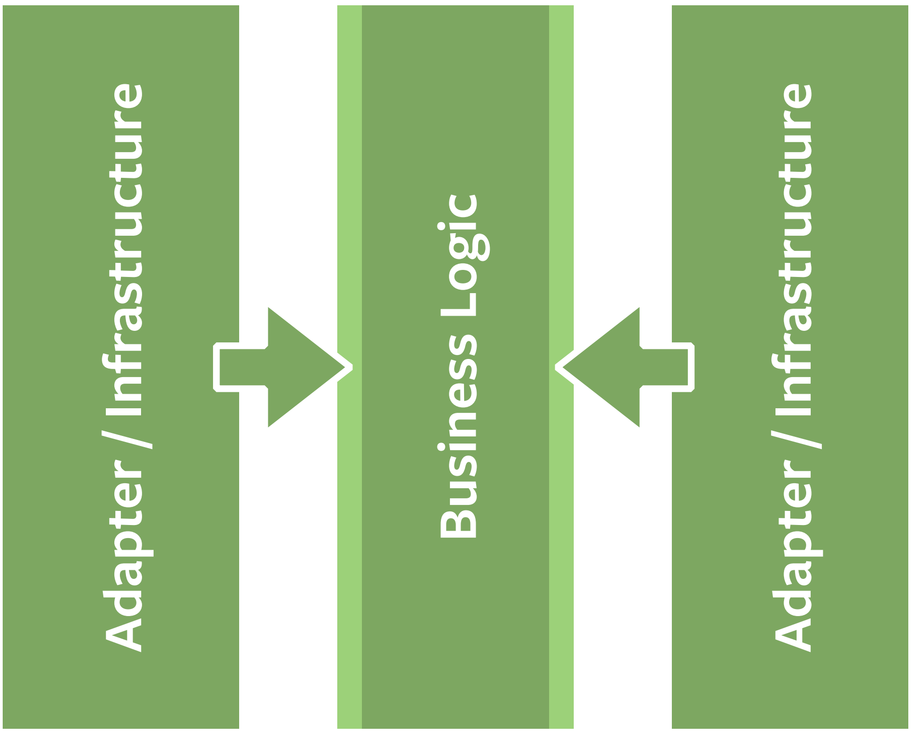
2008

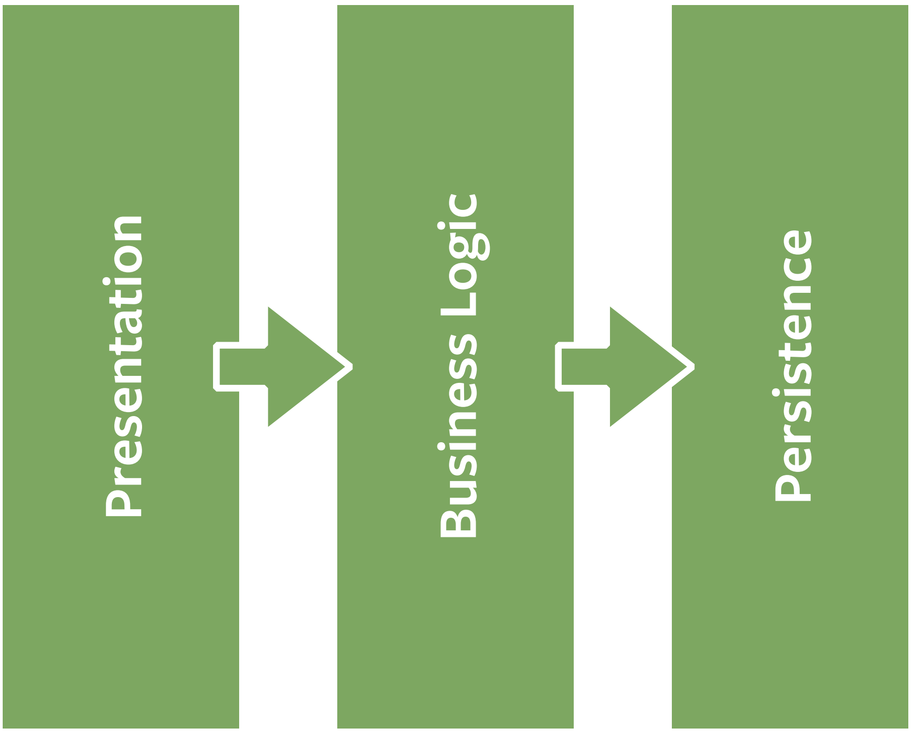

Domain
Application
Infrastructure

Layered Architecture

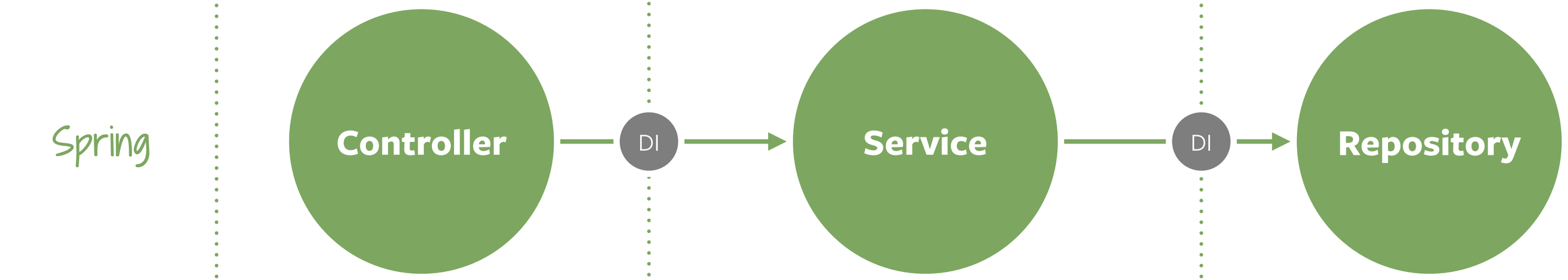
Hexagonal- / Onion-Architecture

Hexagonal- / Onion-Architecture





Layered Architecture



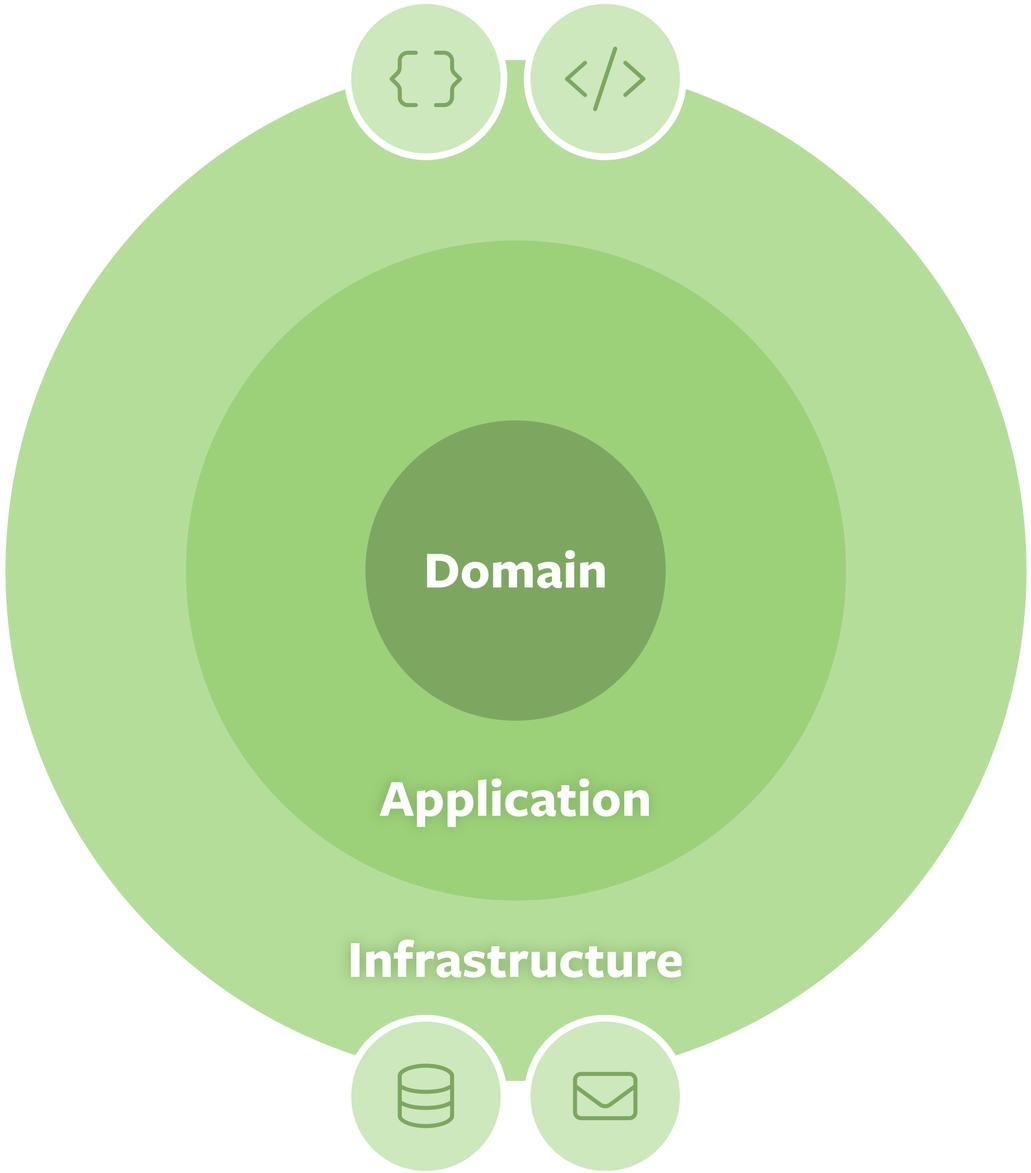
Layered	Presentation →	Business →	Persistence
Hexagonal	Driving Adapter →	Port ← Application → Port	← Driven Adapter
Onion	Infrastructure →	Application / Domain	← Infrastructure

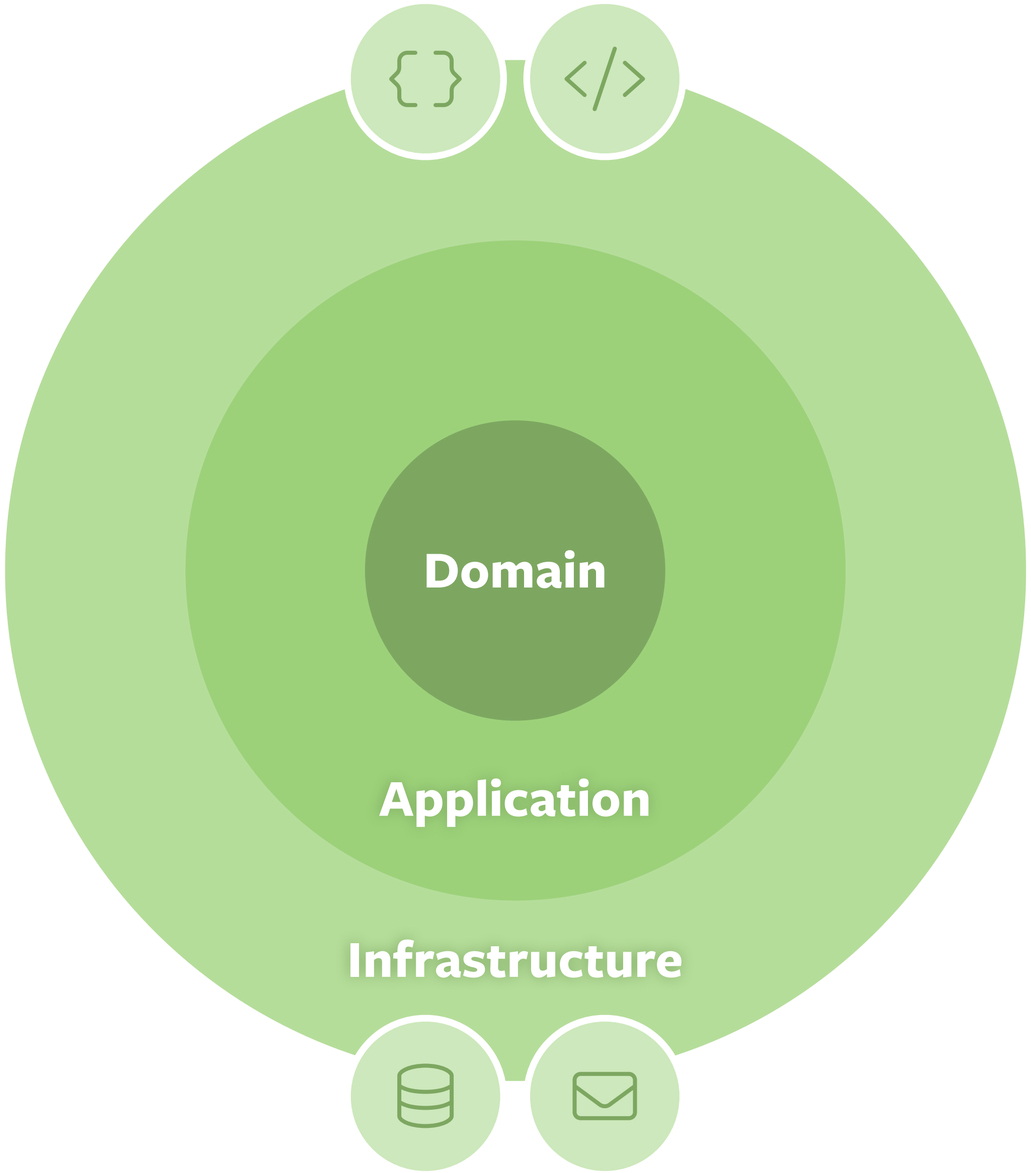
Goals & Effects

Testability

Technology-Free Domain

Domain-Centric?


Domain
Application
Infrastructure


Domain
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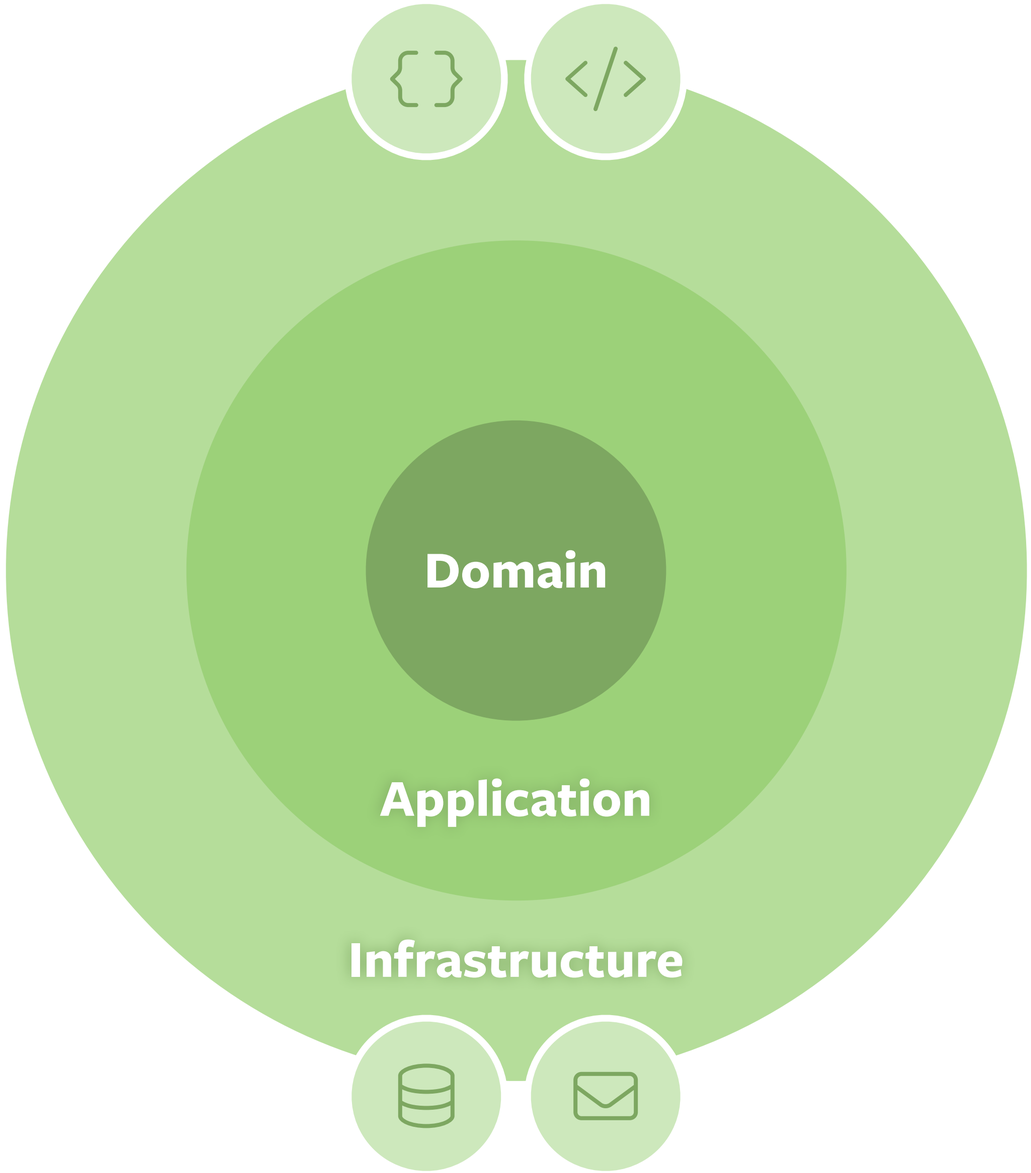
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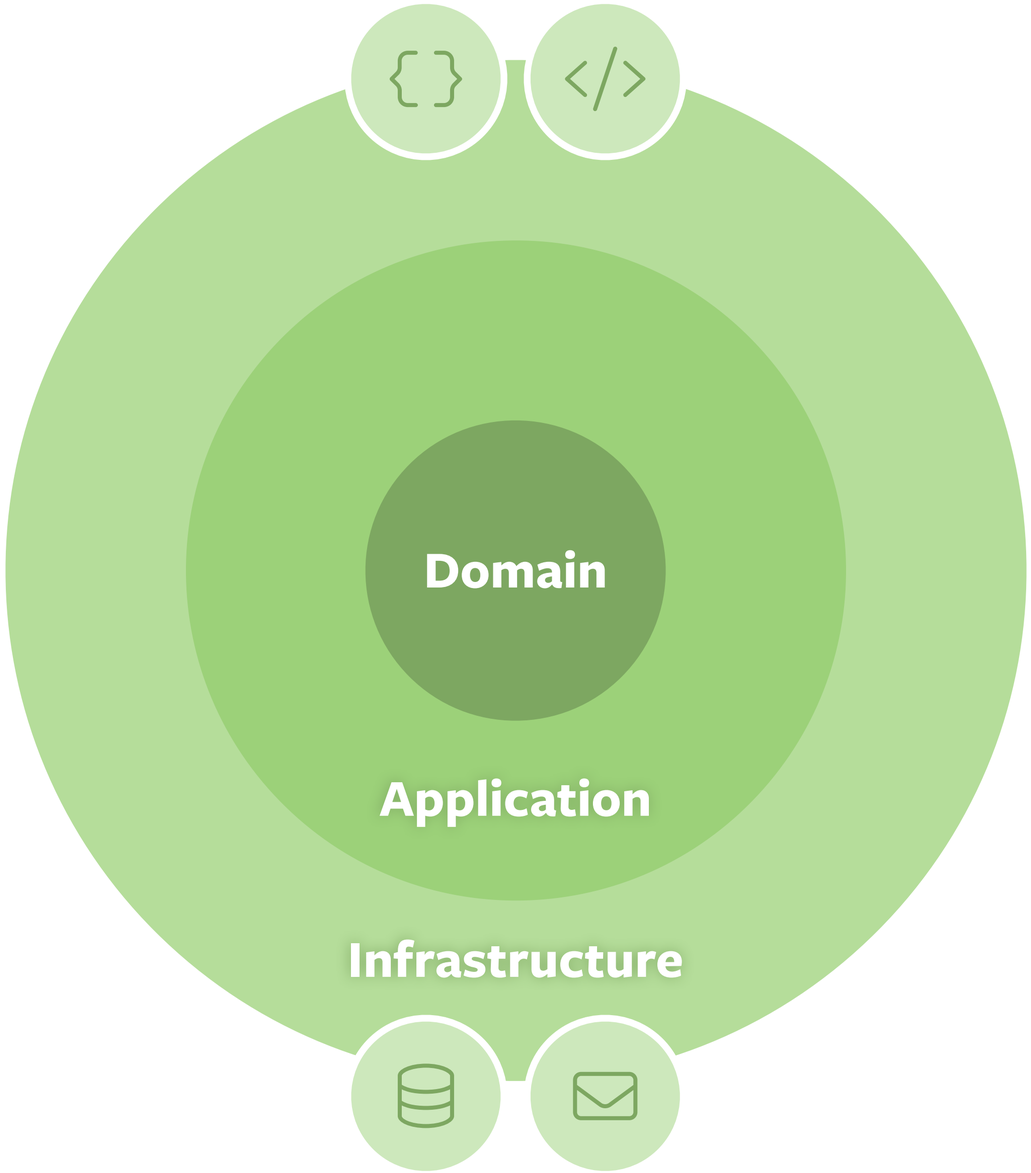
Domain
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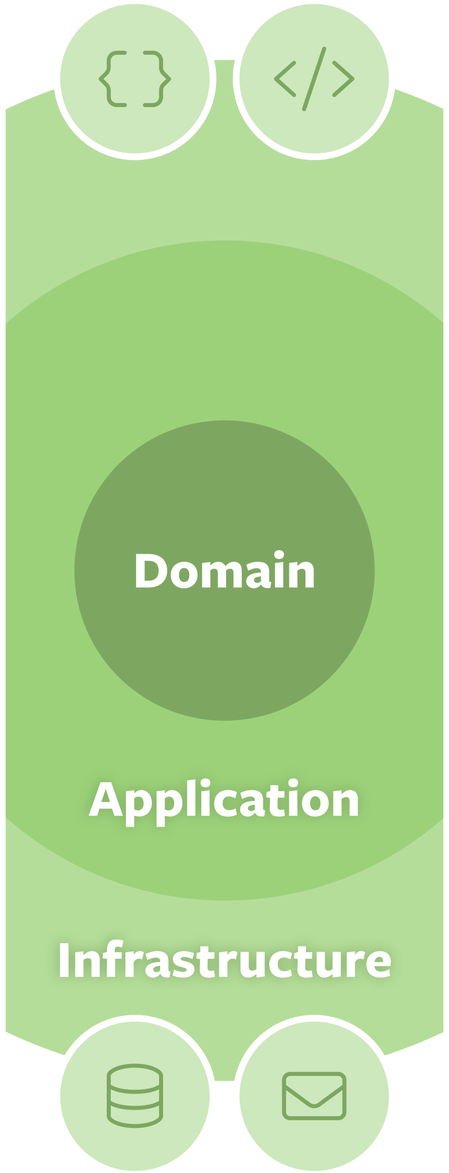
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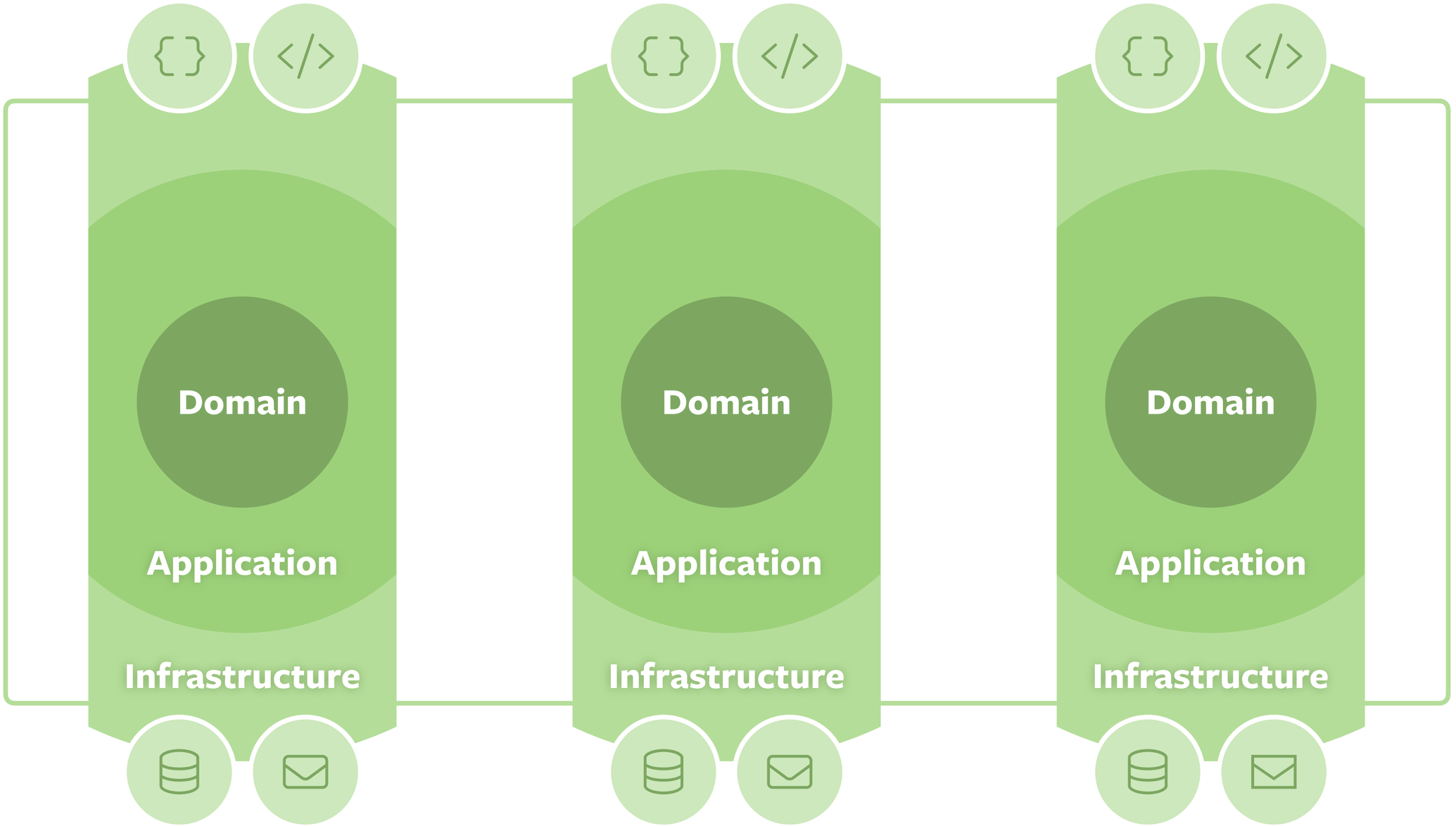
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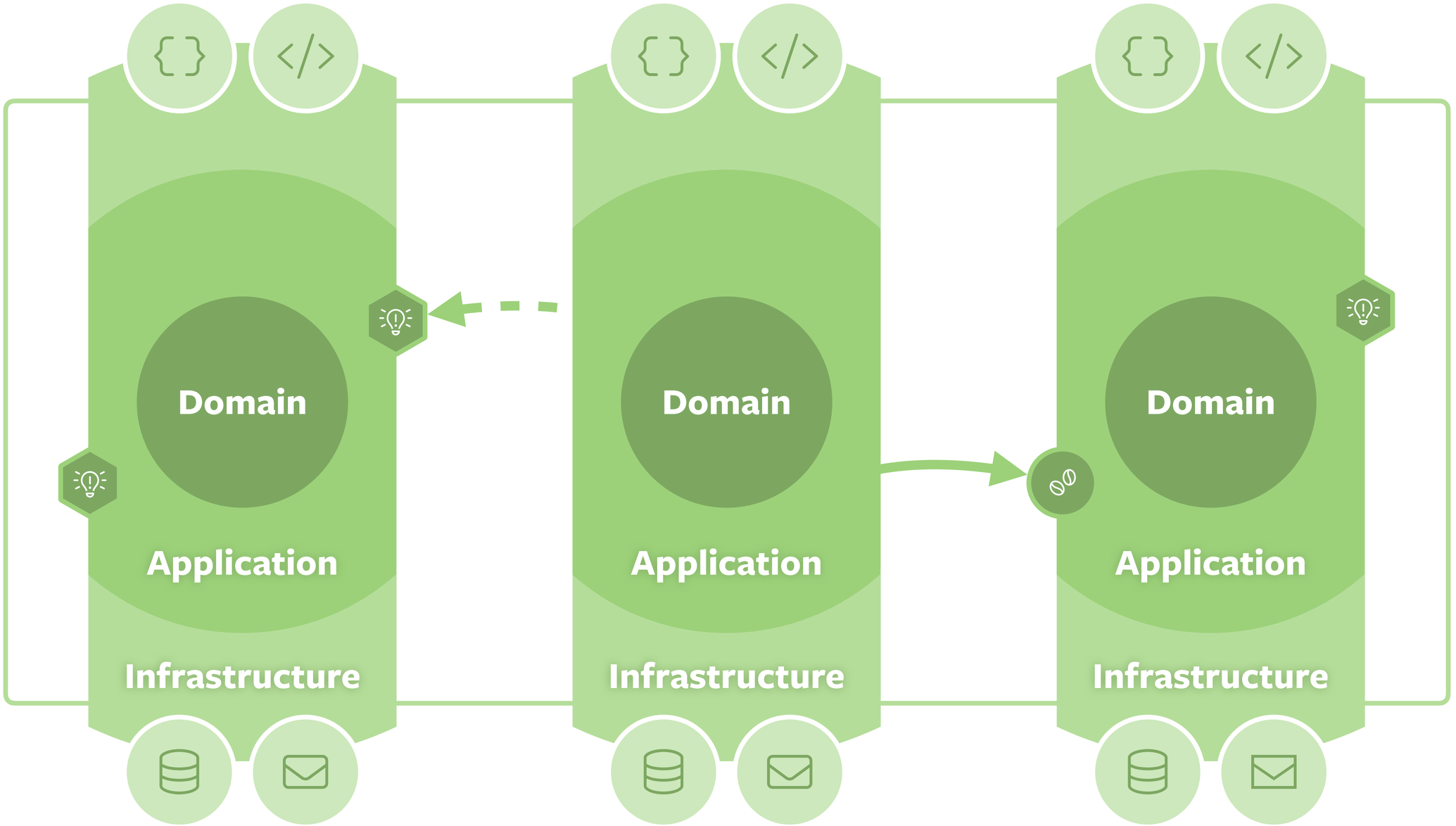
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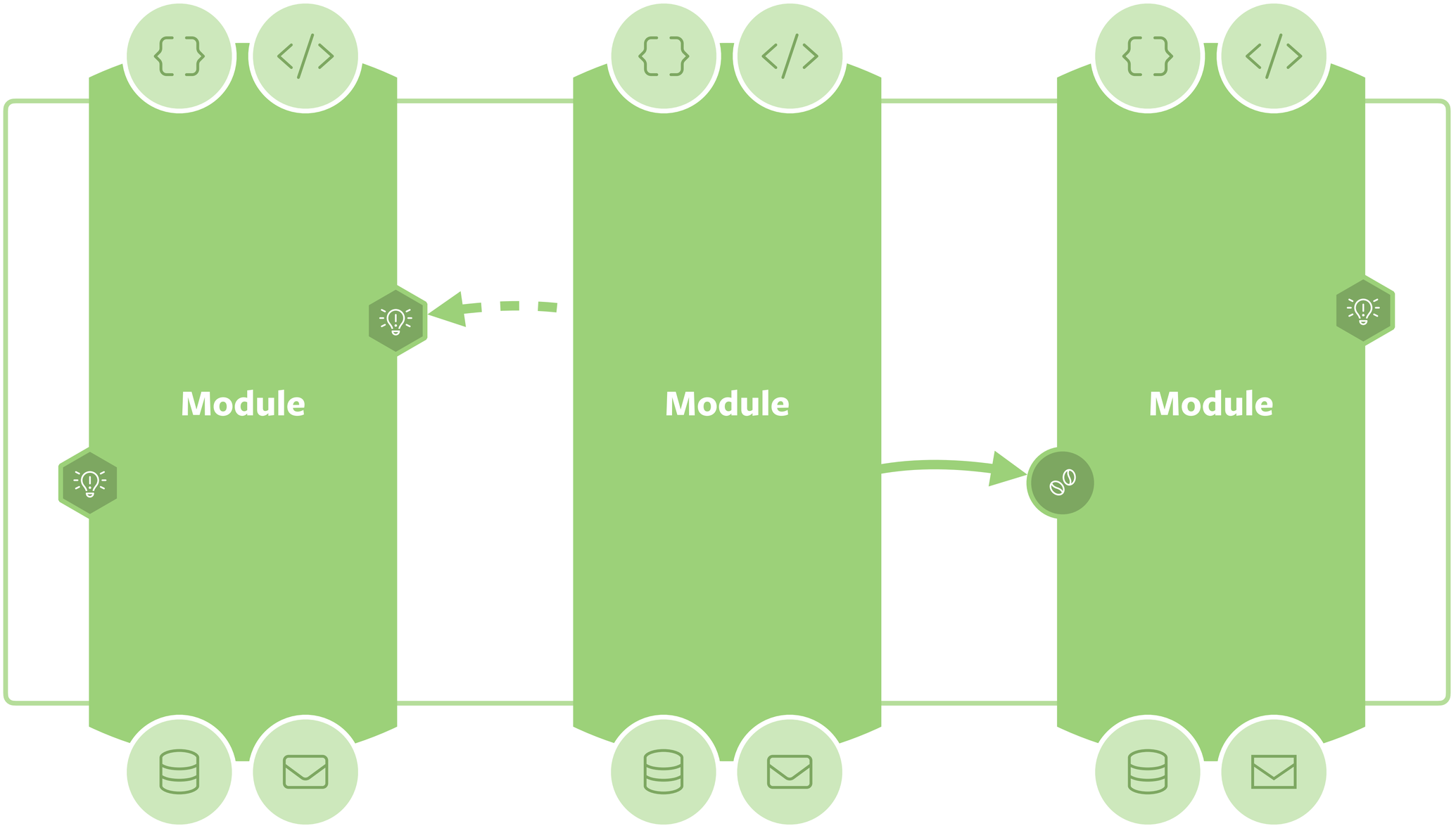


https://odrotbohm.de/2023/07/sliced-onion-architecture

Code structure

Severely inspired by Simon Brown's https://static.simonbrown.je/modular-monoliths.pdf

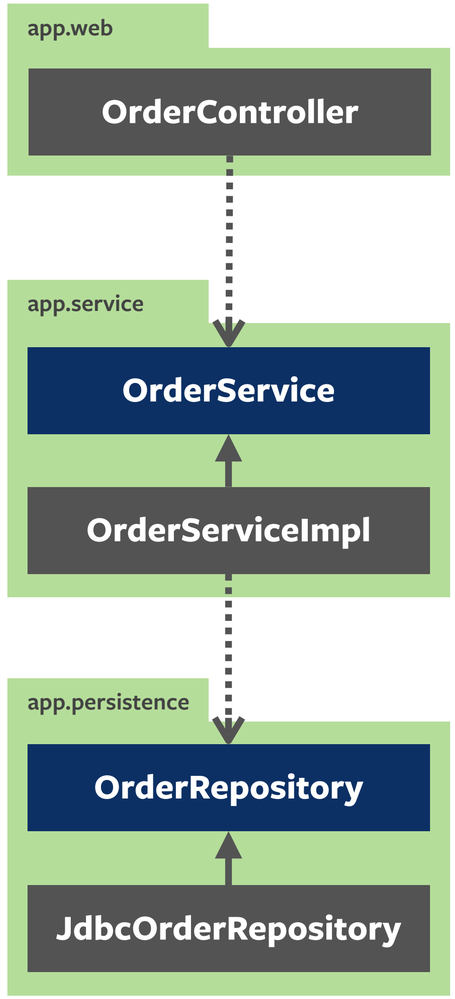


Oliver Drotbohm 🥁 & 👨‍💻
@odrotbohm

Coined Drotbohm's law yesterday: from the structure of a software system you can derive the book the architect read most recently...

Post übersetzen

8:11 vorm. · 7. Juli 2016 aus Stuttgart, Deutschland



Classic Layers

Legend

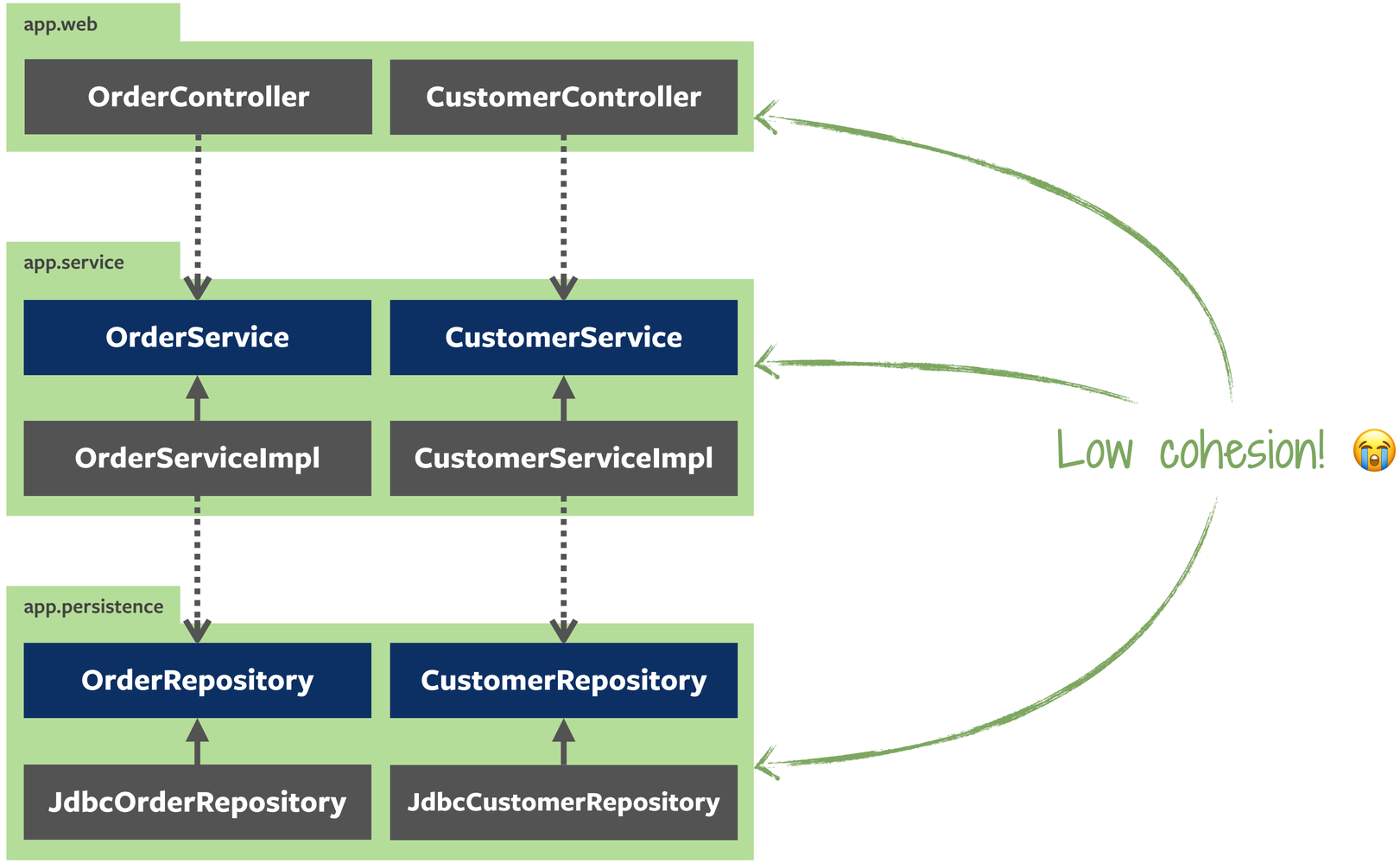
Package / Build Module

Interface

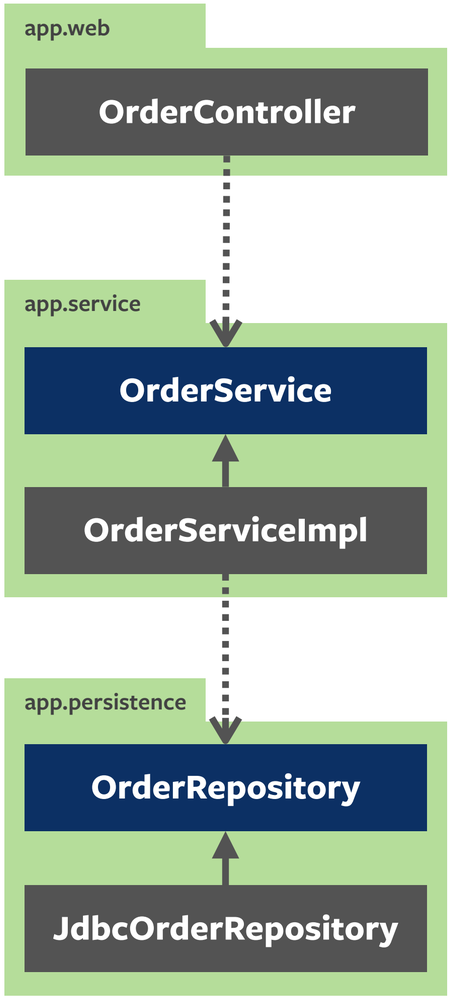
Class

Implements

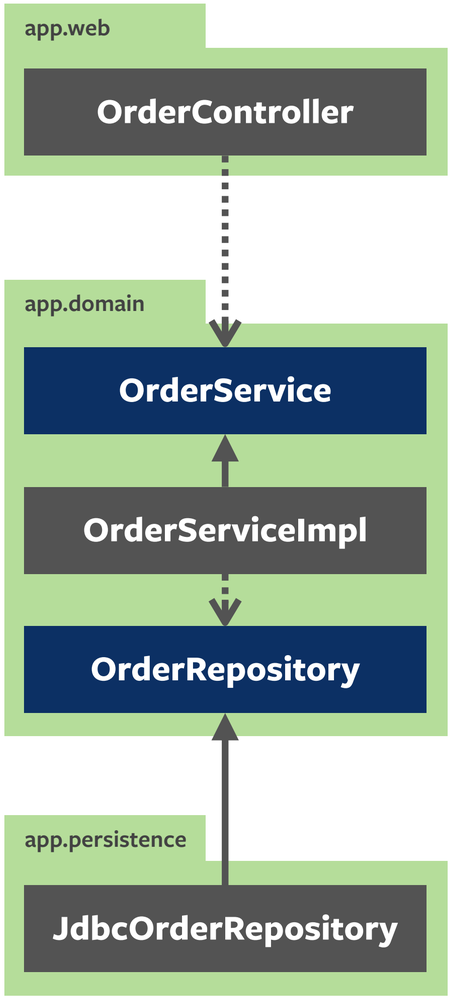
Refers to



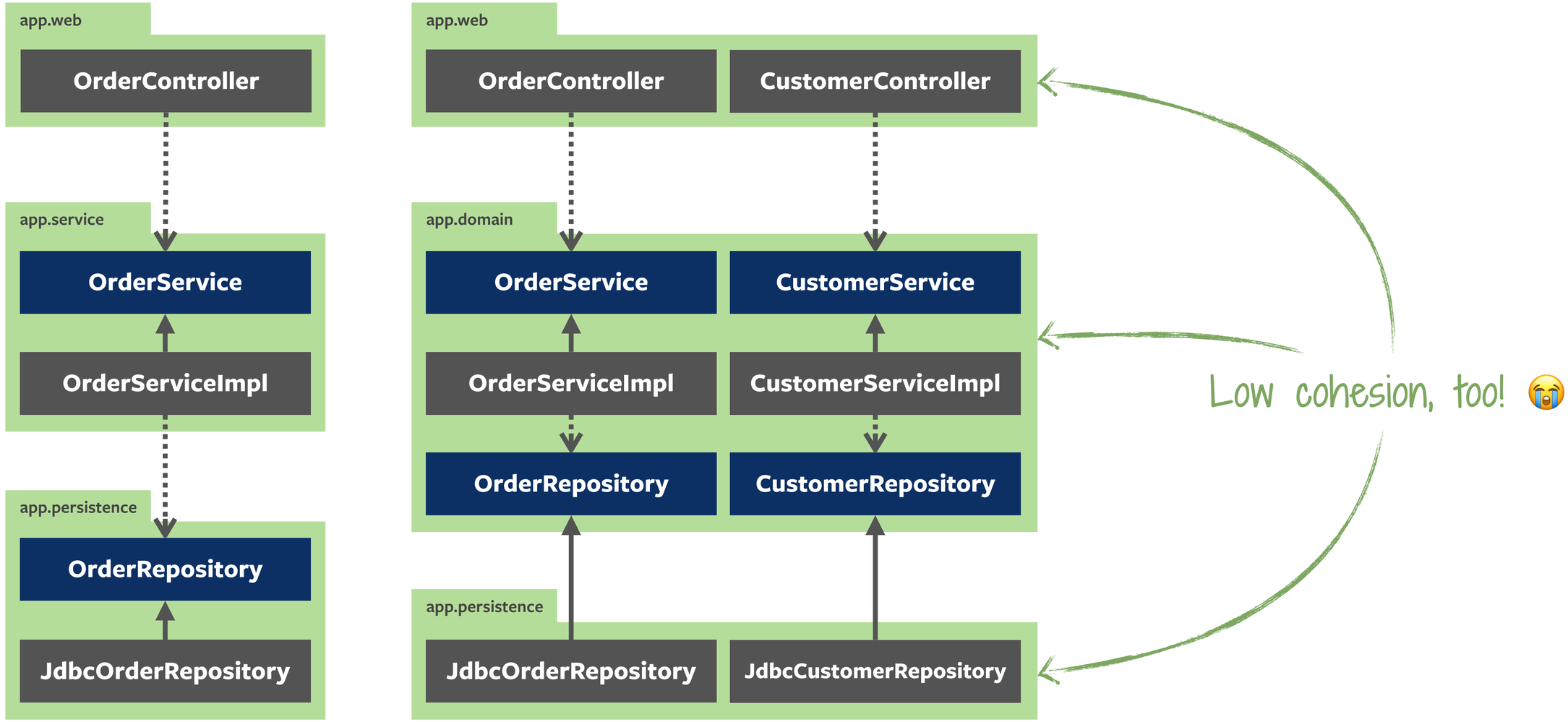
Classic Layers



Classic Layers



Hexagonal / Onion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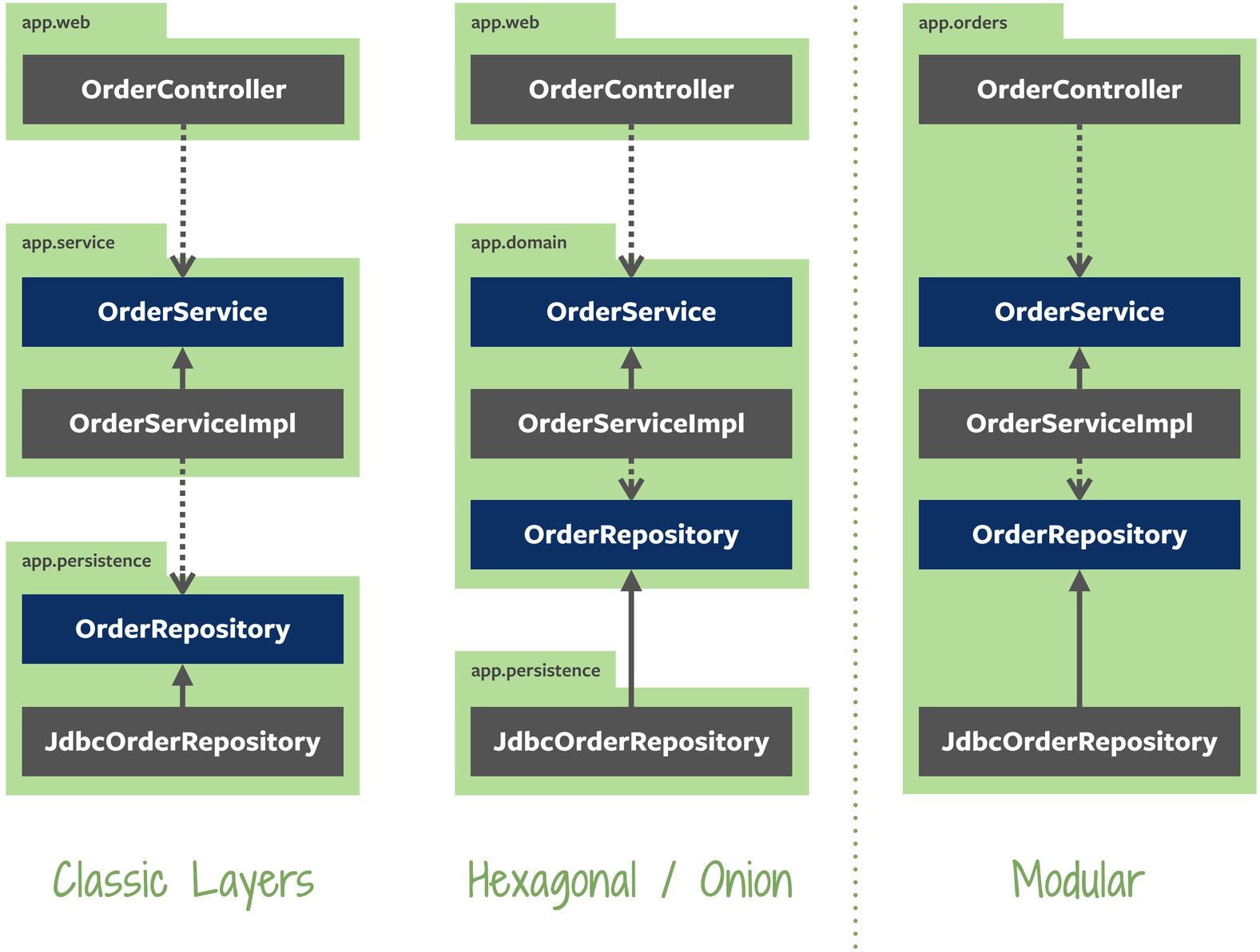
OrderController
app.service
OrderService
OrderServiceImpl
app.persistence
OrderRepository
JdbcOrderRepository
app.web
OrderController
CustomerController
app.domain
OrderService
CustomerService
OrderServiceImpl
CustomerServiceImpl
OrderRepository
CustomerRepository
app.persistence
JdbcOrderRepository
JdbcCustomerRepository
Low cohesion, too! 😭
Classic Layers
Hexagonal / Onion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OrderRepository
app.persistence
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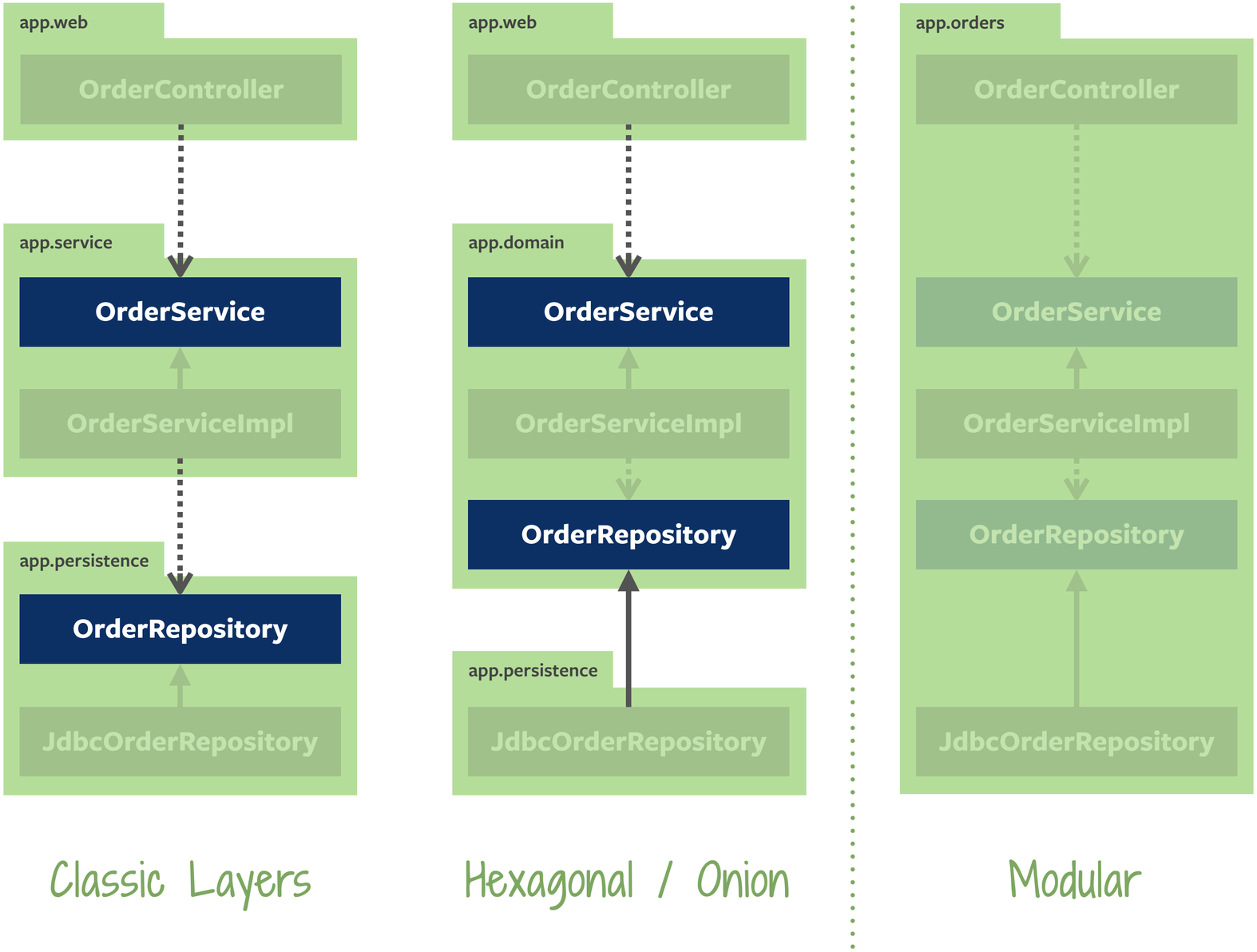
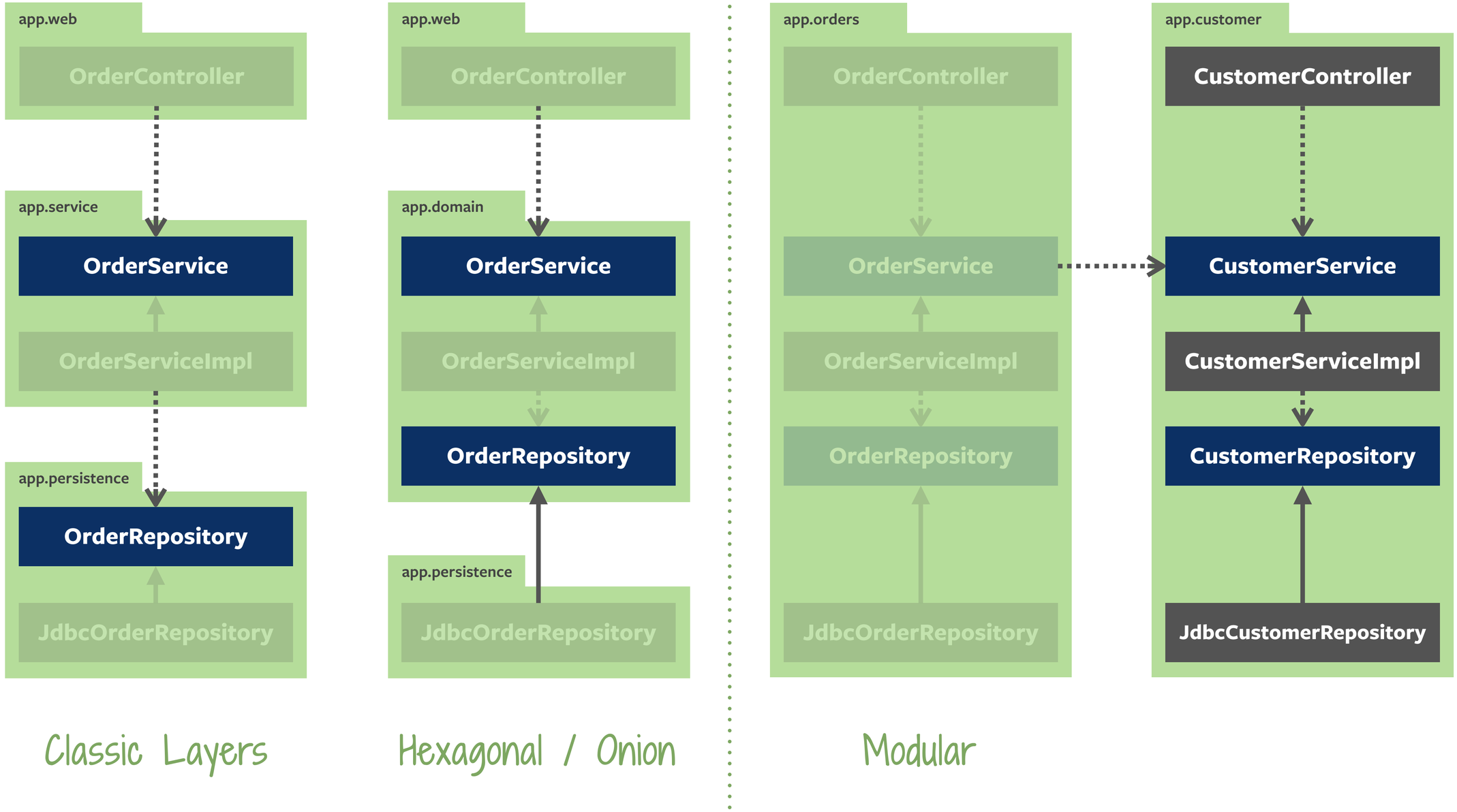
Classic Layers
Hexagonal / Onion
Modular



Classic Layers

Hexagonal / Onion

Modular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app.orders
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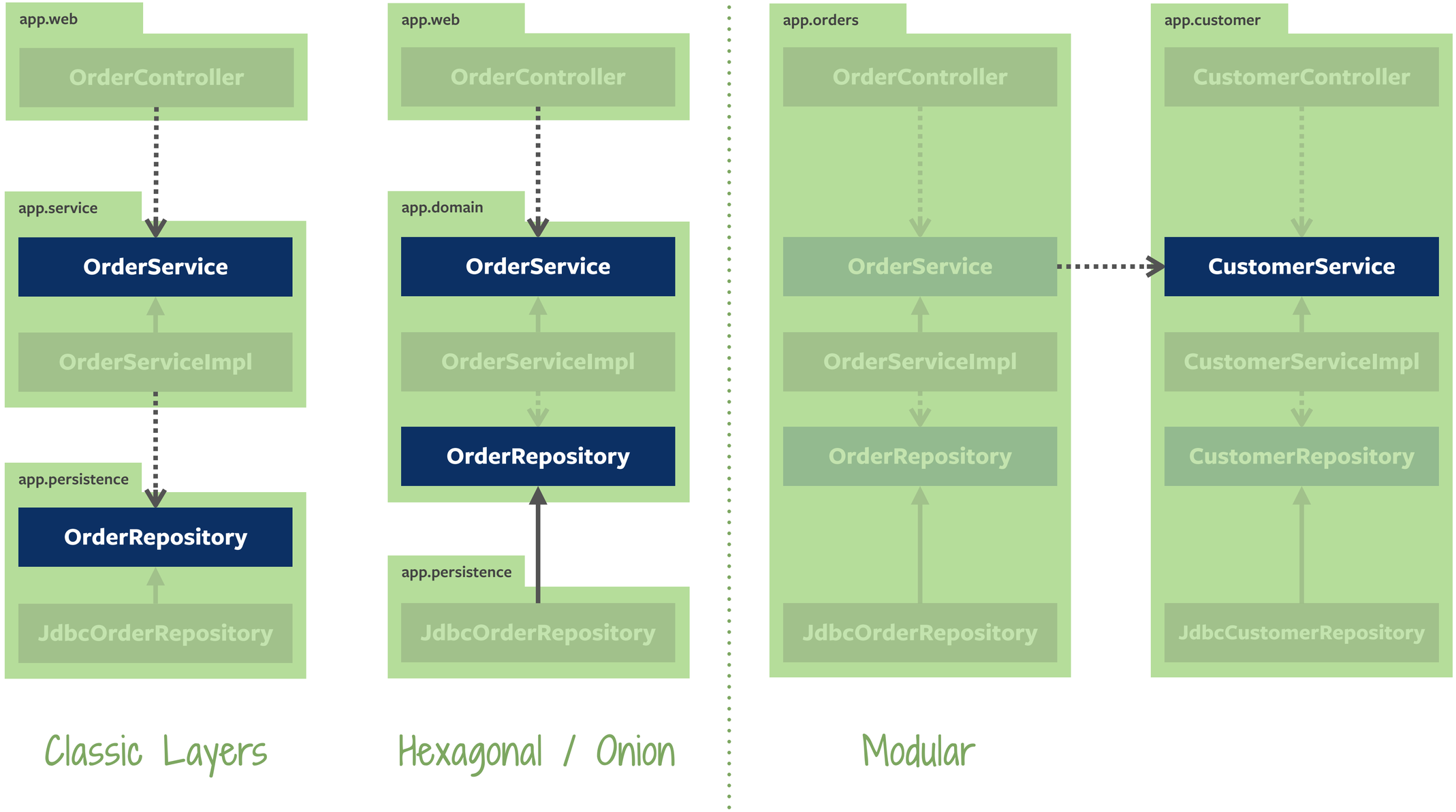
Classic Layers
Hexagonal / Onion
Modular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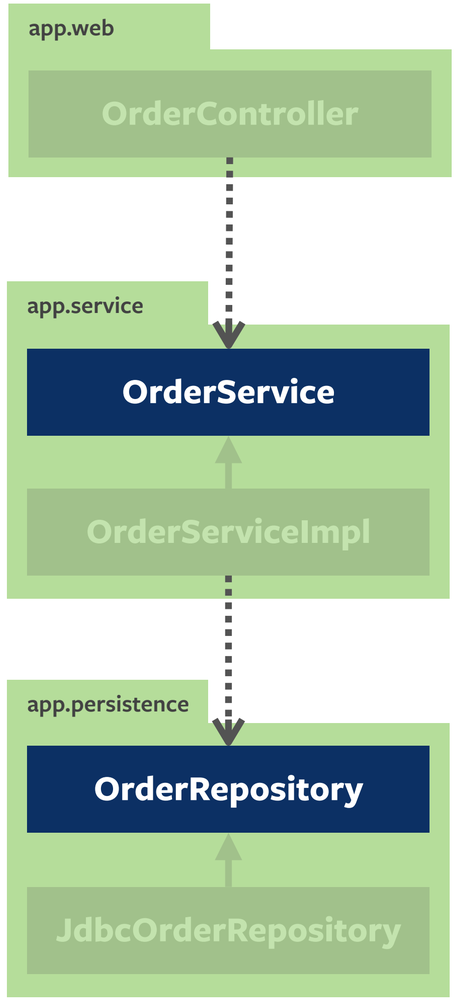
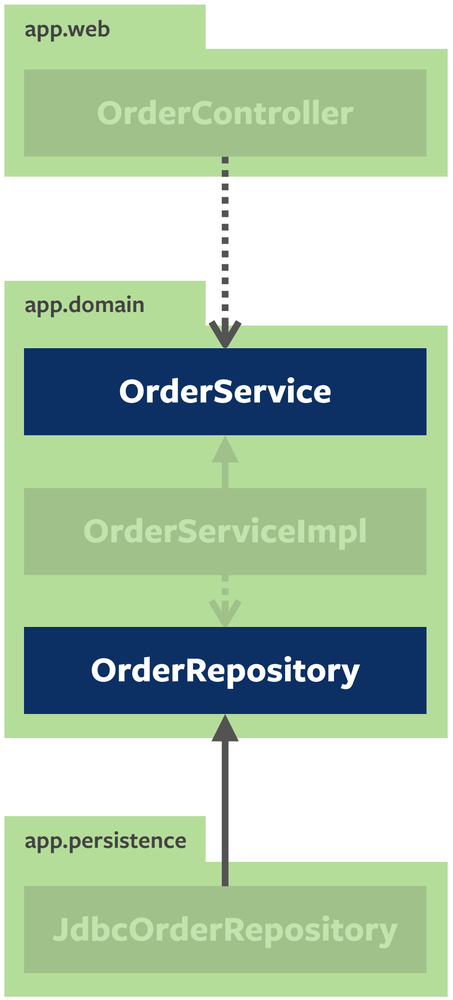
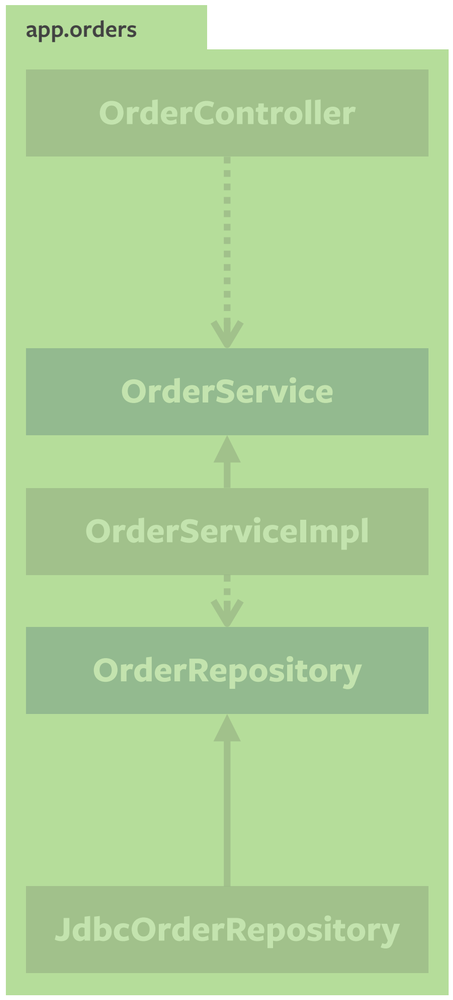
Classic Layers
Hexagonal / Onion
Modular



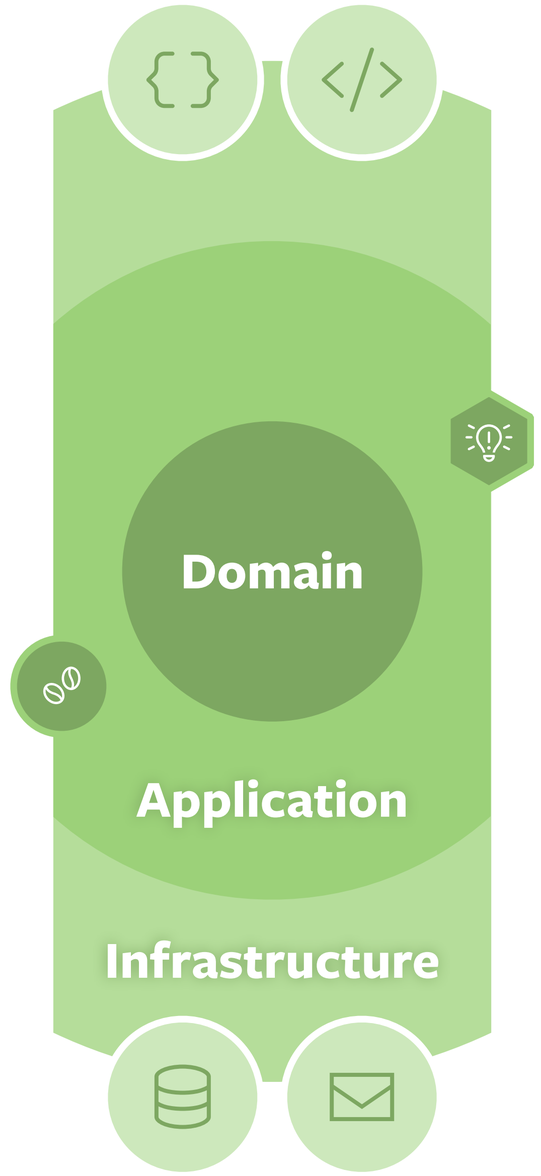
Classic Layers

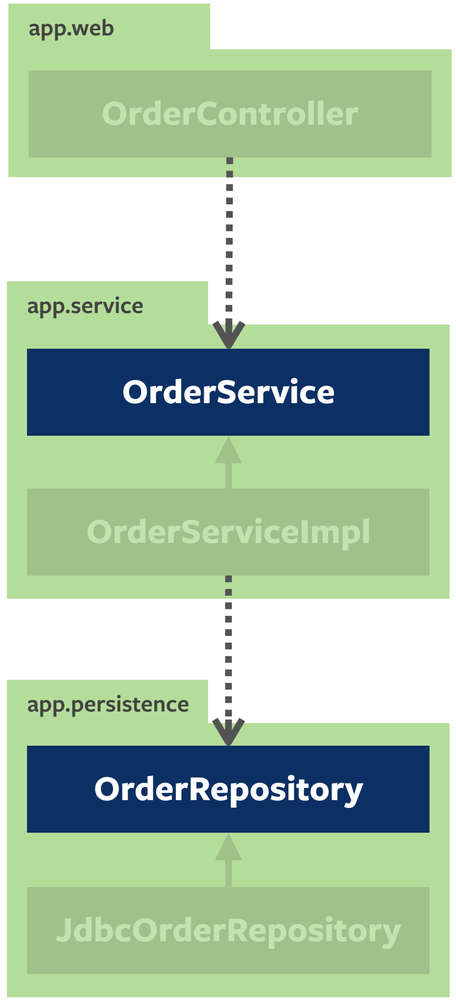


Hexagonal / Onion

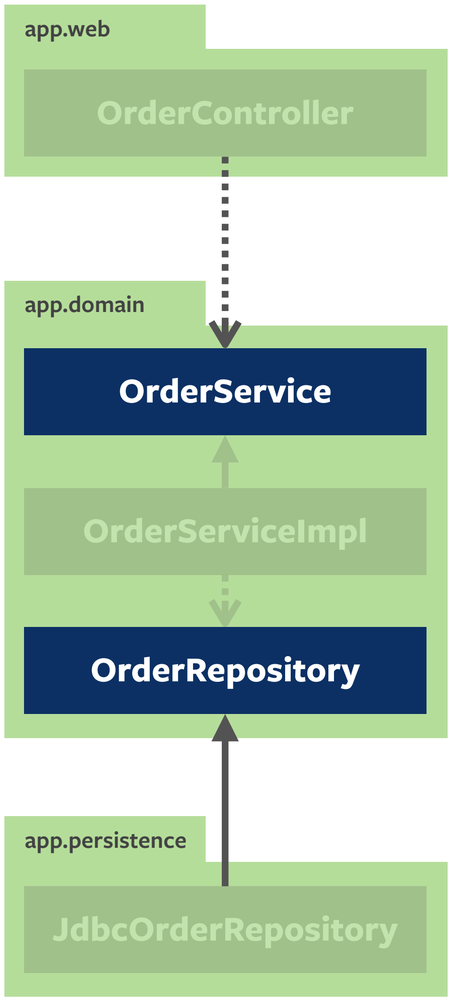


Modular

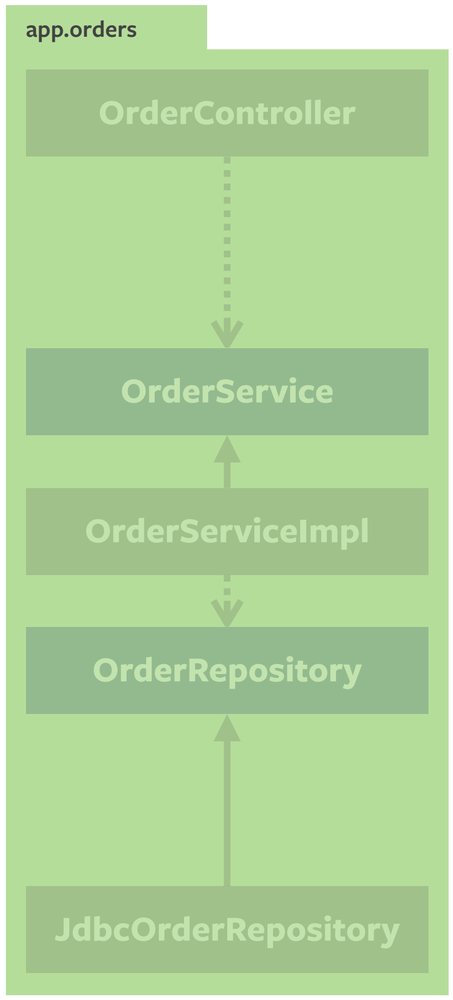




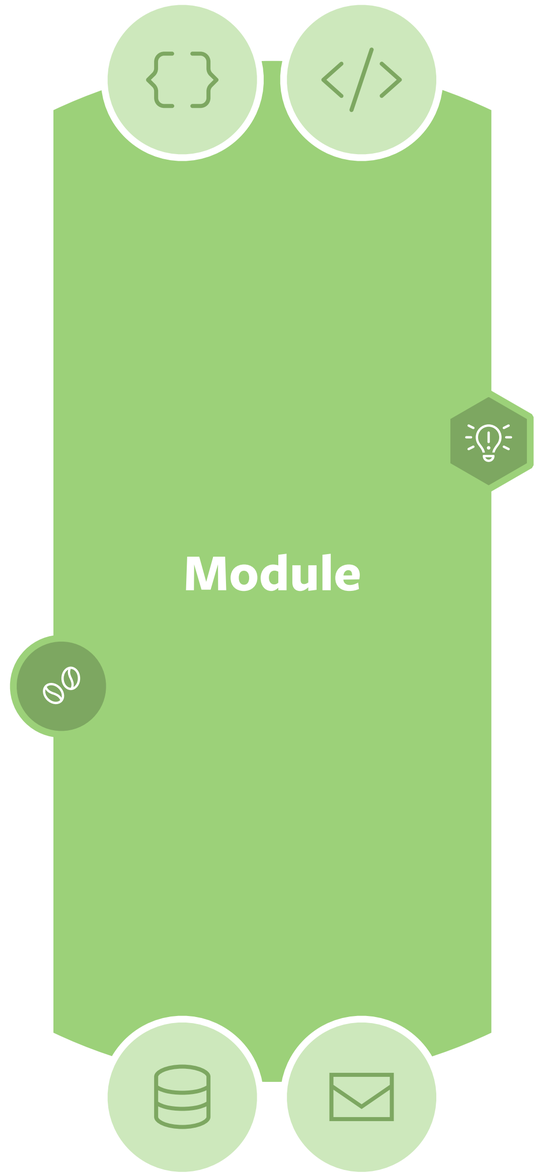
Classic Layers

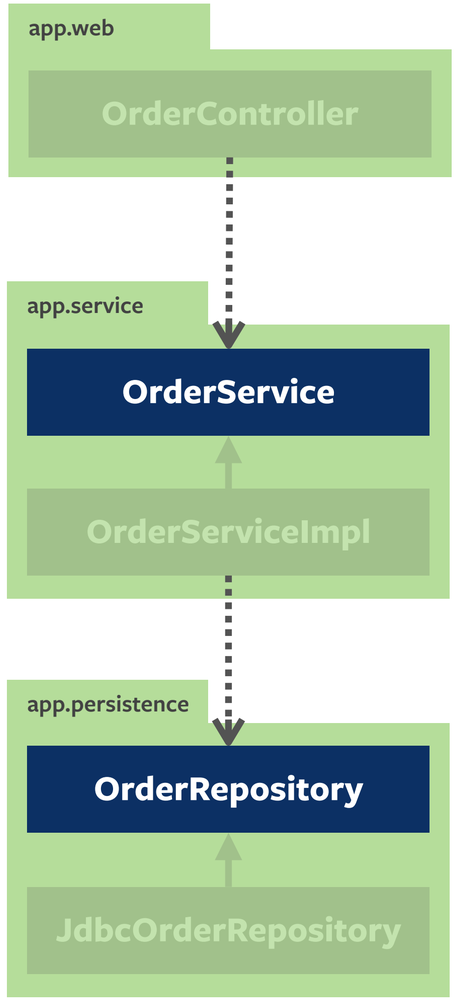


Hexagonal / Onion

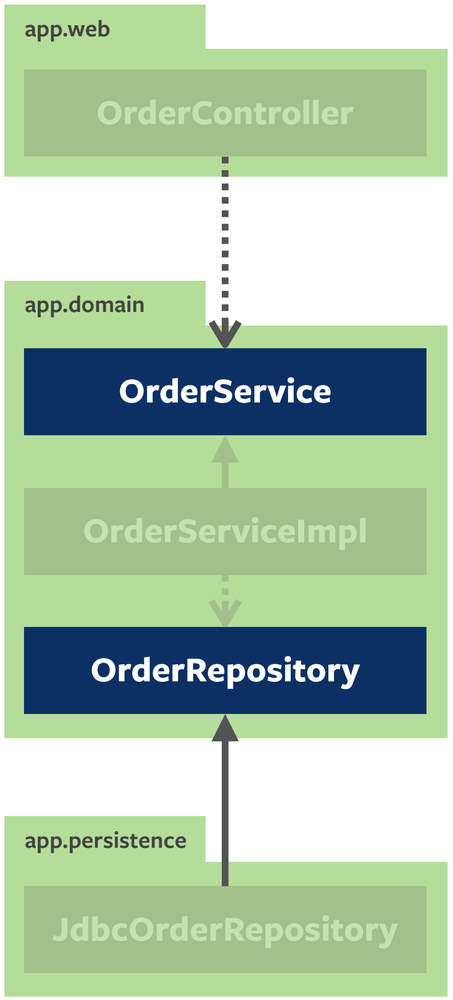


Modular

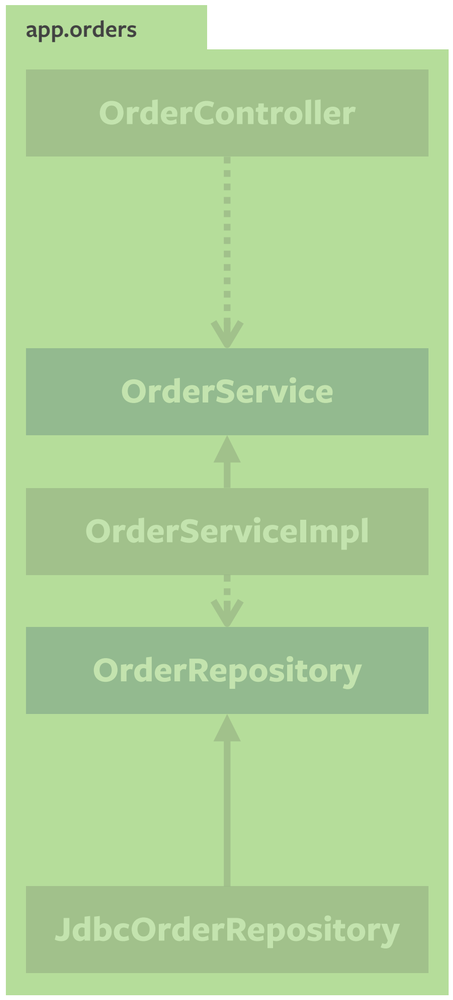




Classic Layers



Hexagonal / Onion



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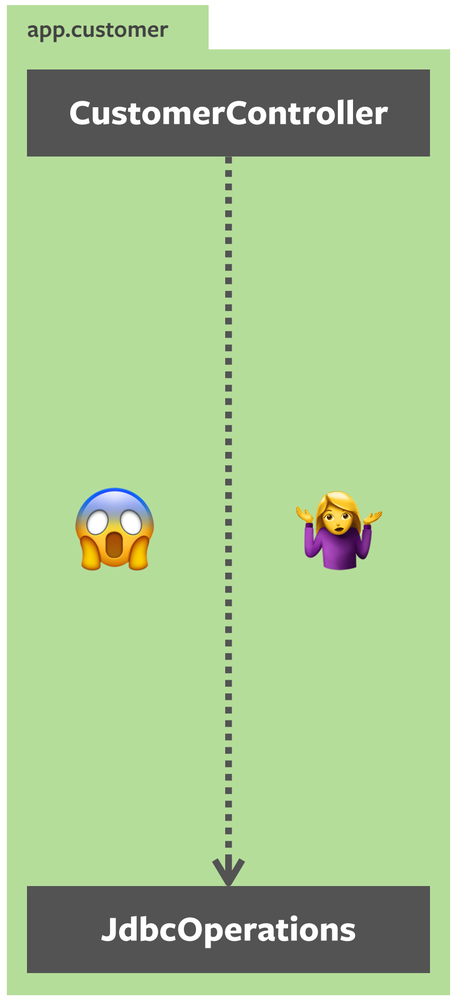
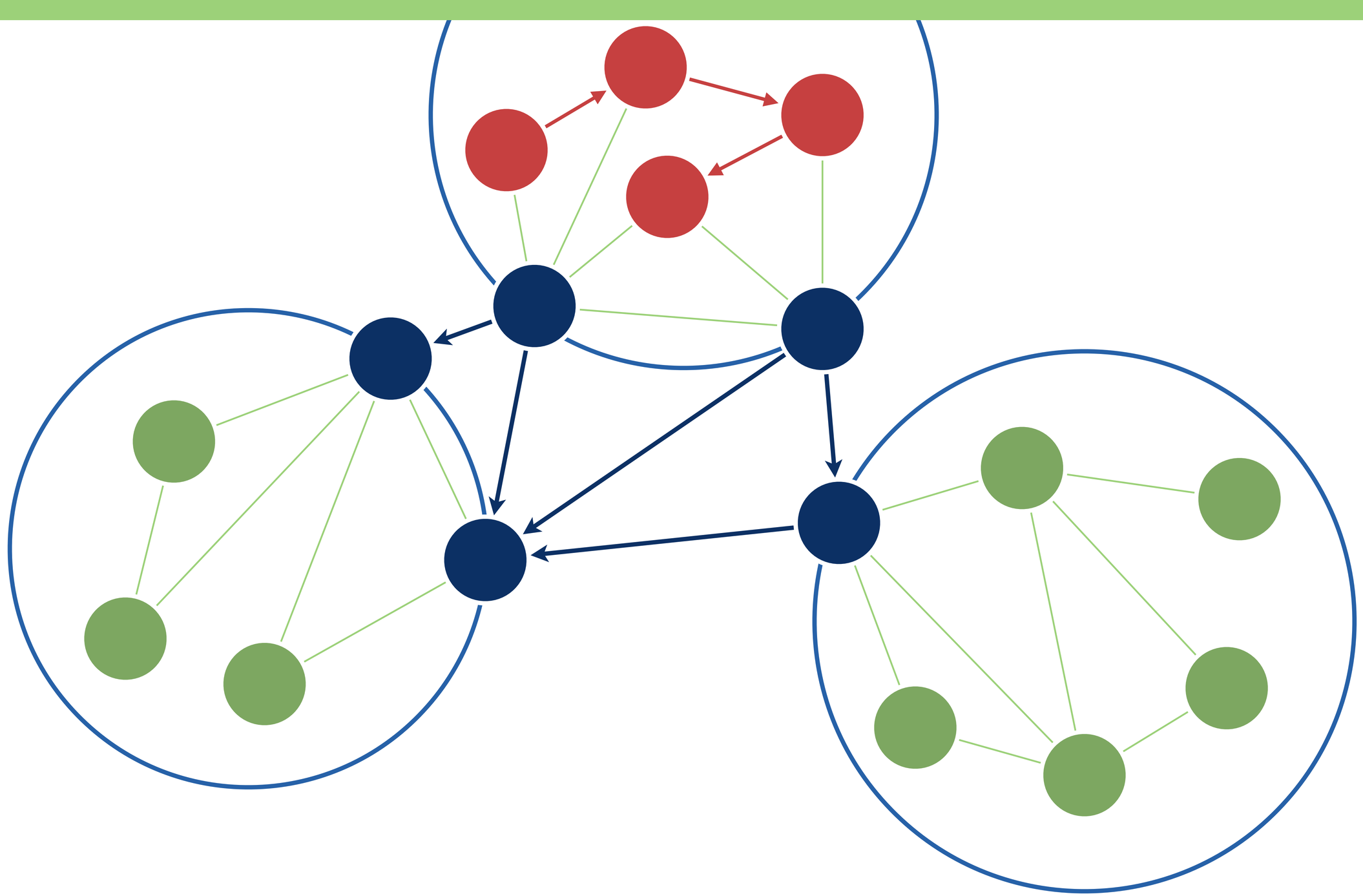


Avoid internal complexity
if domain permits





Oliver Drotbohm
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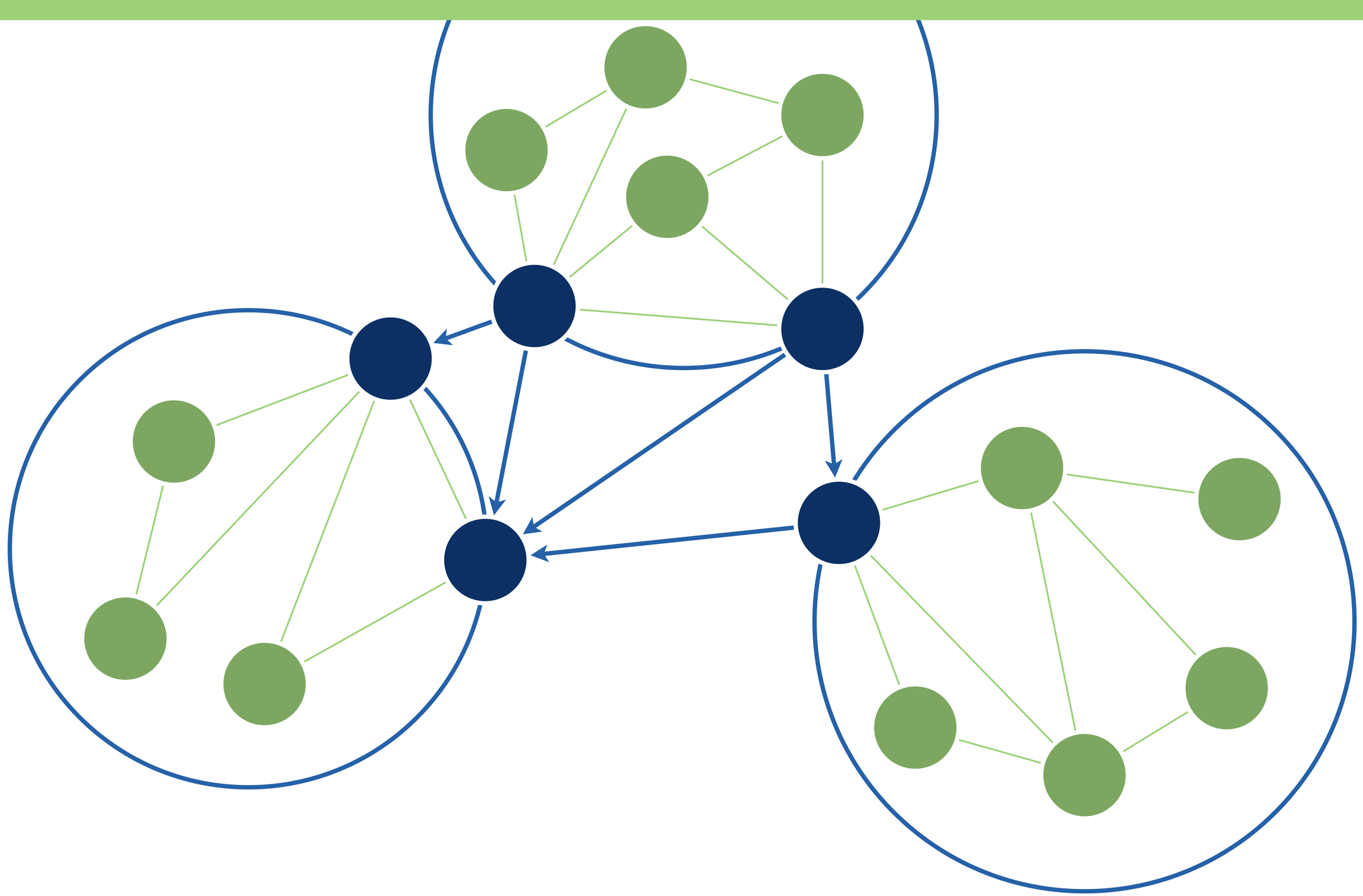
The primary objective of system decomposition is to support change. To contain the effects of a change to as few as possible elements. If your decomposition strategy does not align with that, it's distracting at best and harmful at worst.

24. Sept. 2024, 19:16 · · Ivory for iOS

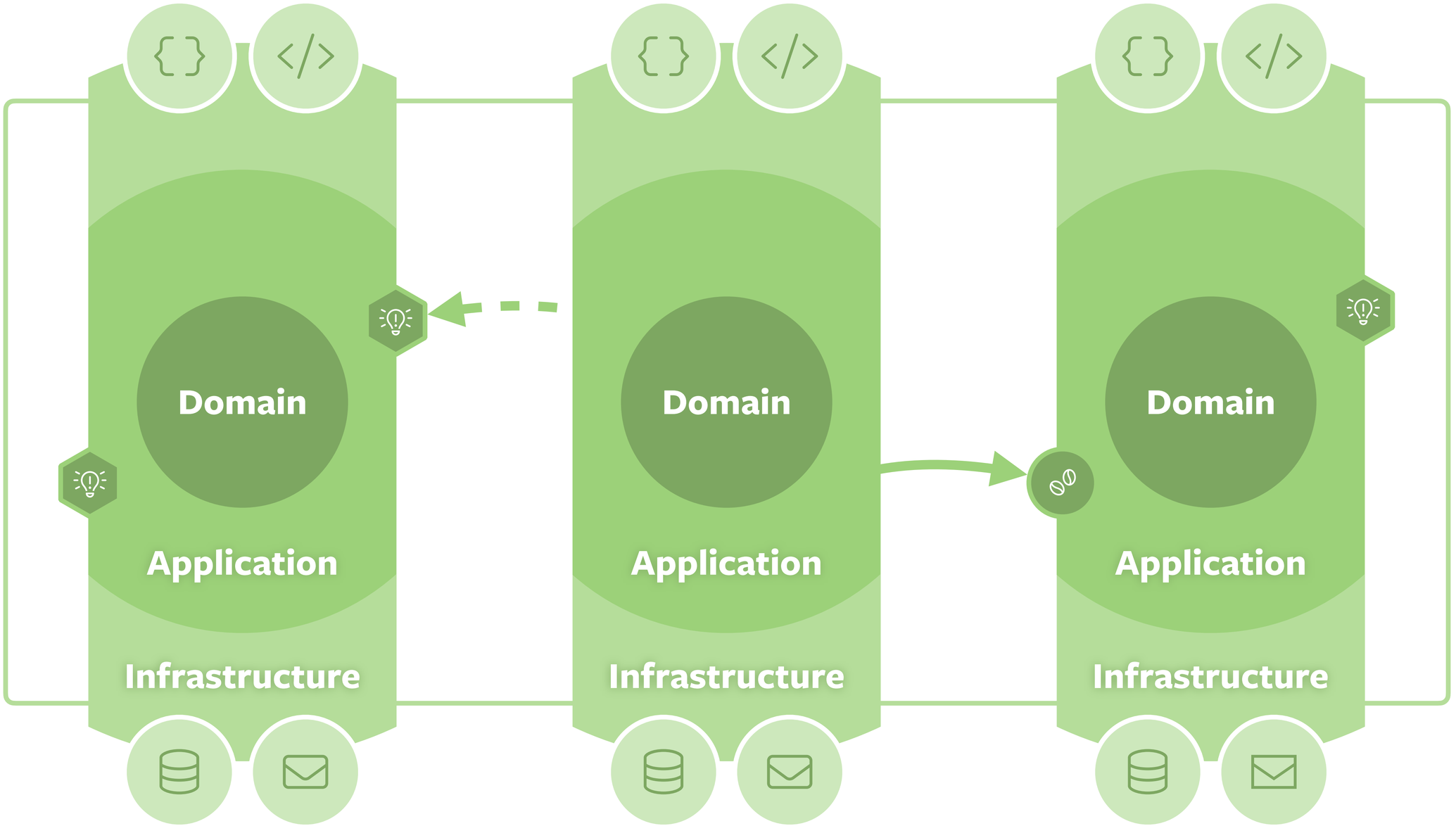
https://chaos.social/@odrotbohm/113193662068876374

Strategic considerations

Designing for cohesion leads to decoupling, but not vice versa.



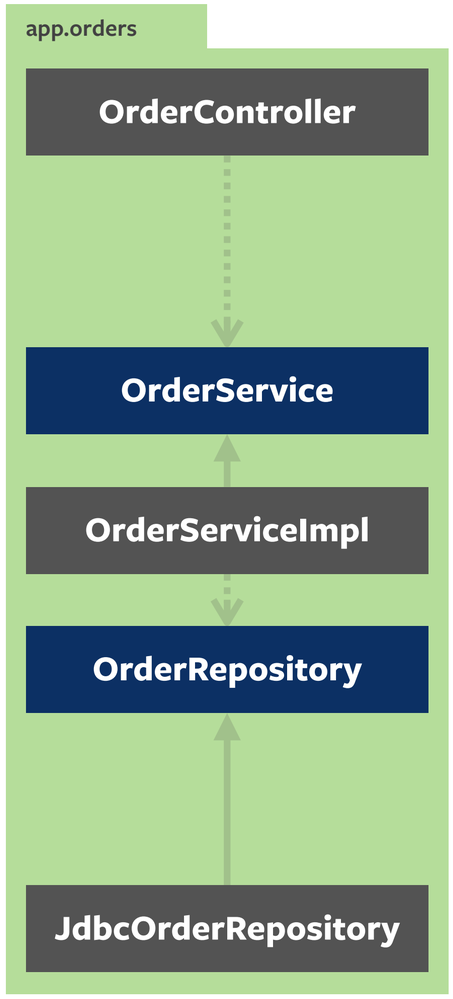
Functional Decomposition over Technical Decomposition


Domain
Application
Infrastructure
Domain
Application
Infrastructure
Domain
Application
Infrastructure

Intrinsic Complexity determines Accidental Complexity

Classic Layers

Hexagonal / Onion



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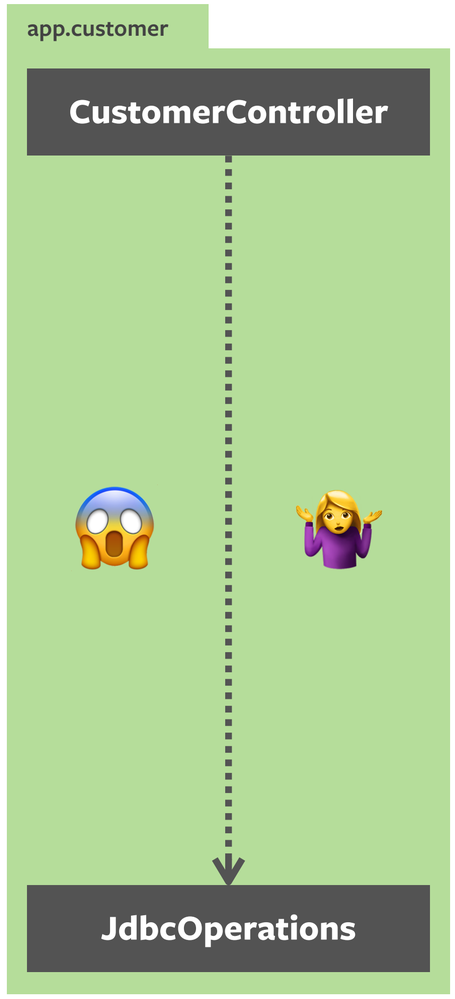
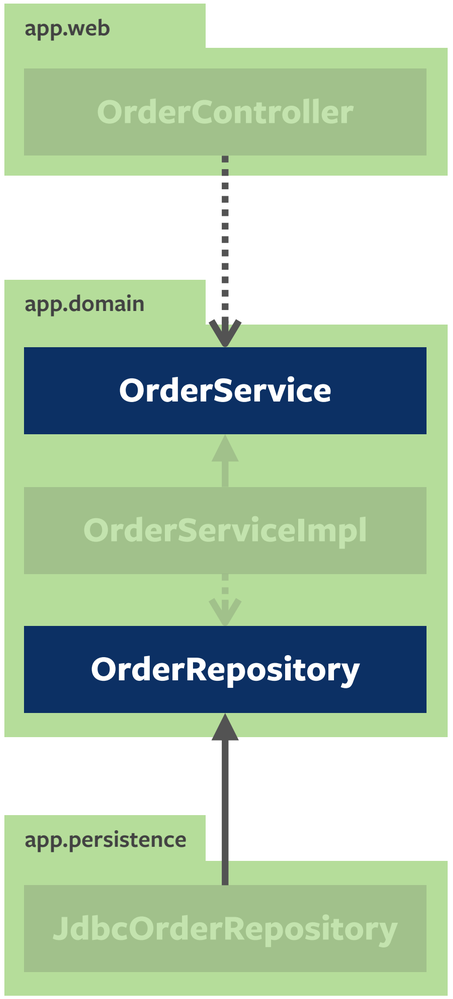


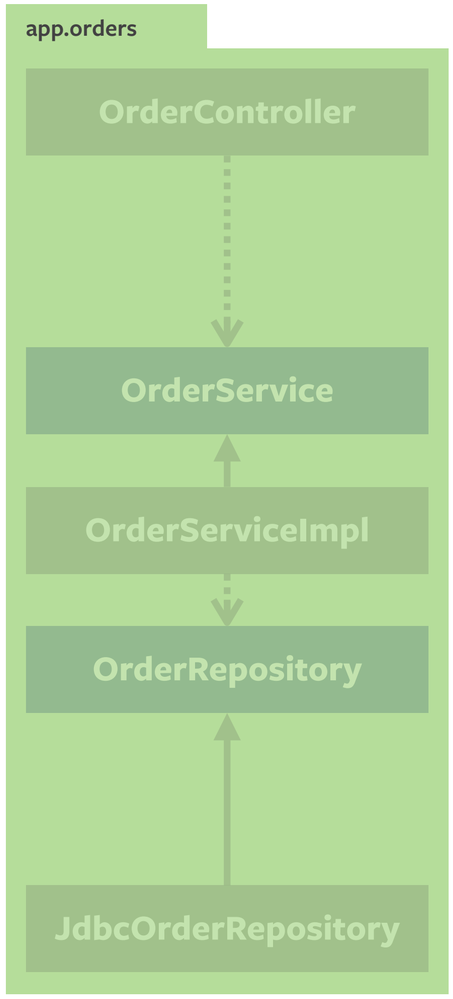
Avoid internal complexity
if domain permits

Encapsulation over Organisation





Hexagonal / Onion



Modular

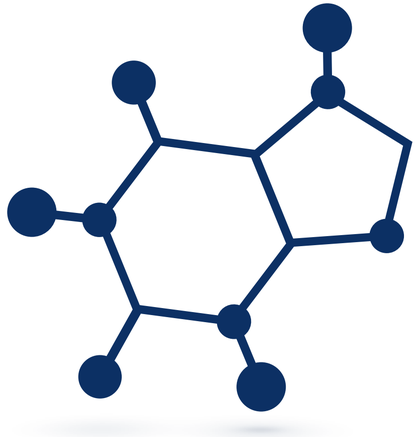


One more thing…



Spring Tools





jMolecules

Thank you!



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