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Micro-services with Event(Domain Data) Driven Architecture
Presentation goal

...to share the significance of visualising domain data and key implementation patterns towards adoption of micro service architecture inside legacy estate.
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Raghvendra S Rathore
Lead Solution Architect @ IG

• Enterprise Data & Integration Architectures
• Lean Development
• Trading Systems

..spent most of my career working with Investment banks and fund houses solving those complex orchestrations and business event choreographies...
Story of growing **challenges** with architecture evolution

Balancing quantum **entanglement** with domain aggregates

Solving cross domain & more complex concerns with **architecture patterns**

Success so far.. Value Unlocked.

Insights..
Driver for Change:
Web/Mobile platforms offering

Software Architecture: 3 Tier Architecture, App container, Stateful & Stateless beans
Driver for Change: Decommission Old Mainframe Tech

Software Architecture: N Tier Architecture, JPA, Spring
Driver for Change: Need for scale, more products

Software Architecture: SOA, EDA, CI
Driver for Change: Product Acquisition, Public Cloud Integration

Software Architecture: Cloud Services
Driver for Change:
Increasing need for data insights, RegTech

Software Architecture:
Microservices, DevOps, Cloud Services
Quantum entanglement is a physical phenomenon which occurs when pairs or groups of particles interact in ways such that the quantum state of each particle cannot be described independently of the state of the other(s), even when the particles are separated by a large distance—instead, a quantum state must be described for the system as a whole.
• **Encapsulating** quantum entanglement inside domain boundaries at different level of abstractions (Contexts within Contexts)

• Building 2-way-anti-corruption-layer which hides data and behaviour complexity and brings simplicity.

• Provides **lead time** for application estate within domain boundary to **transform** into micro services.
Domain Aggregate (from outside)...

Data Driven Architecture
Domain Aggregate (from inside)...

Data Driven Architecture
Architecture Implementation Patterns

- Domain Aggregate
- Read Aggregate
- Business Function Validator
- History Services
- Cloud Extension
Read Aggregate Pattern

Inspired from Event Sourcing & CQRS

Problem: Who is responsible for cross domain concerns?

Stateful consumer can hold a local read model but what about stateless platforms and services?

Solution: Read Aggregate

Result: Domains are unburdened from cross domain read enrichment concerns
Business Function Validator

Pattern

Inspired from Trade Surveillance

Problem: Who is responsible for cross-domain validation concerns?
If each domain is only guarding their public state who guards cross-domain enterprise state, different business functions need different cross-domain validations.

Solution: Business Function Validator

Result: Spotting problems proactively by consistently validating enterprise data for enterprise critical business rules.

Data Driven Architecture
History Service

Pattern

Inspired from Lambda Architecture

Problem:
Who is responsible for serving historical data?
If domain only guards & maintains current state then where does history maintained and served from.

Solution:
History Service

Result:
Event store serving as single source of truth for historical facts and dimensions.
Cloud Extension Pattern: adopting cloud services

**Problem:** With a growing need to leverage cloud services, how can enterprises integrate best with multiple public cloud ecosystems while keeping the architecture harmonized.

**Solution:** Cloud Extension with 2-way mirroring

**Result:** Applications can be seamlessly built in on-prem or cloud ecosystem with similar data interfaces.
Value unlocked..

Lambda/Kappa architecture patterns for validations, surveillance near real time reporting and analysis (ongoing work)

Hybrid cloud architecture patterns for dev-ops and truly lean delivery

App Elasticity. Fault tolerant, highly scalable, elastic apps deployed cross data centres

Telemetry made easy with domain events
Key things to watch for..

- Schema evolution & breaking (non-backward compatible) changes need considering
- Continuous need for automated-governance tools
- Reactive Apps deal with complexity but consider behavior modelling
- Nothing compensates for good monitoring and system telemetry
Identifying level of abstractions for enterprise communications is **essential**.

Domain aggregate pattern helps in starting **transition** from current state.

Implementation patterns **simplify** transition.
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