

A Case Study in Design

The IASA Pillars in the Real World

The IASA Pillars

Business Technology Strategy	IT Environment	Design	Quality Attributes	Human Dynamics
Business Fundamentals	Application Development	Whole Systems Design	Balancing and Optimizing Quality Attributes	Presentation Skills
Strategy Development	Infrastructure	Design Methodologies and Processes		Managing the Culture
Industry Analysis	Technical Project Management	Requirements Modeling		Customer Relations
Business Valuation	Platforms and Frameworks	Decomposition and Reuse		Leadership and Management
Investment Prioritization, Planning	Change Management	Patterns and Styles		Writing Skills
Requirements Discovery, Constraints Analysis	Asset Management	Design Analysis and Testing		Peer Interaction
Compliance	Governance	Architectural Description		Collaboration and Negotiation
Business Architecture Methods & Tools	Testing Methods, Tools, and Techniques	Views & Viewpoints		
Decision Support		Traceability Throughout the Lifecycle		
Knowledge Management				

The ITABoK

- Vast body of knowledge
- Can be overwhelming
- How do we traverse the pillars in daily life?

Case Study

- A radio frequency identification (RFID) based asset tracking and management system
- How design played out during execution
- Learnings

The Idea

- Asset tracking and management using RFID
- Suitable for deployment in various settings like warehouses, factories, offices
- A system generic enough for implementation in any of these environments

Finding out About RFID

- Public sources
- Client-provided presentations
- Discussions

The Devices

- Tags
 - Active – on-board battery, transmits periodically
 - Passive – has to be polled by an RFID reader
 - Battery-assisted passive – has battery, but activated in presence of RFID reader
 - Various form factors
 - Wristband
 - Badge
 - Sticker
 - Other
- Readers
 - Devices that sense radio frequency signals
 - Concentrator software

Phase 1

- Functional prototype – proof of interface
- Environment
 - Active tags
 - One RFID reader
 - Concentrator software for RFID reader
 - Windows application
 - C#
 - SQL Server
- Store RFID data from concentrator in database

Phase 2

- Building an asset tracking system using RFID
- Vision
 - Enable mapping a factory floor
 - Enable asset tracking on map
 - Build rules engine that can take specified actions based on various parameters
 - Custom rules – no business rules engine until rules seen

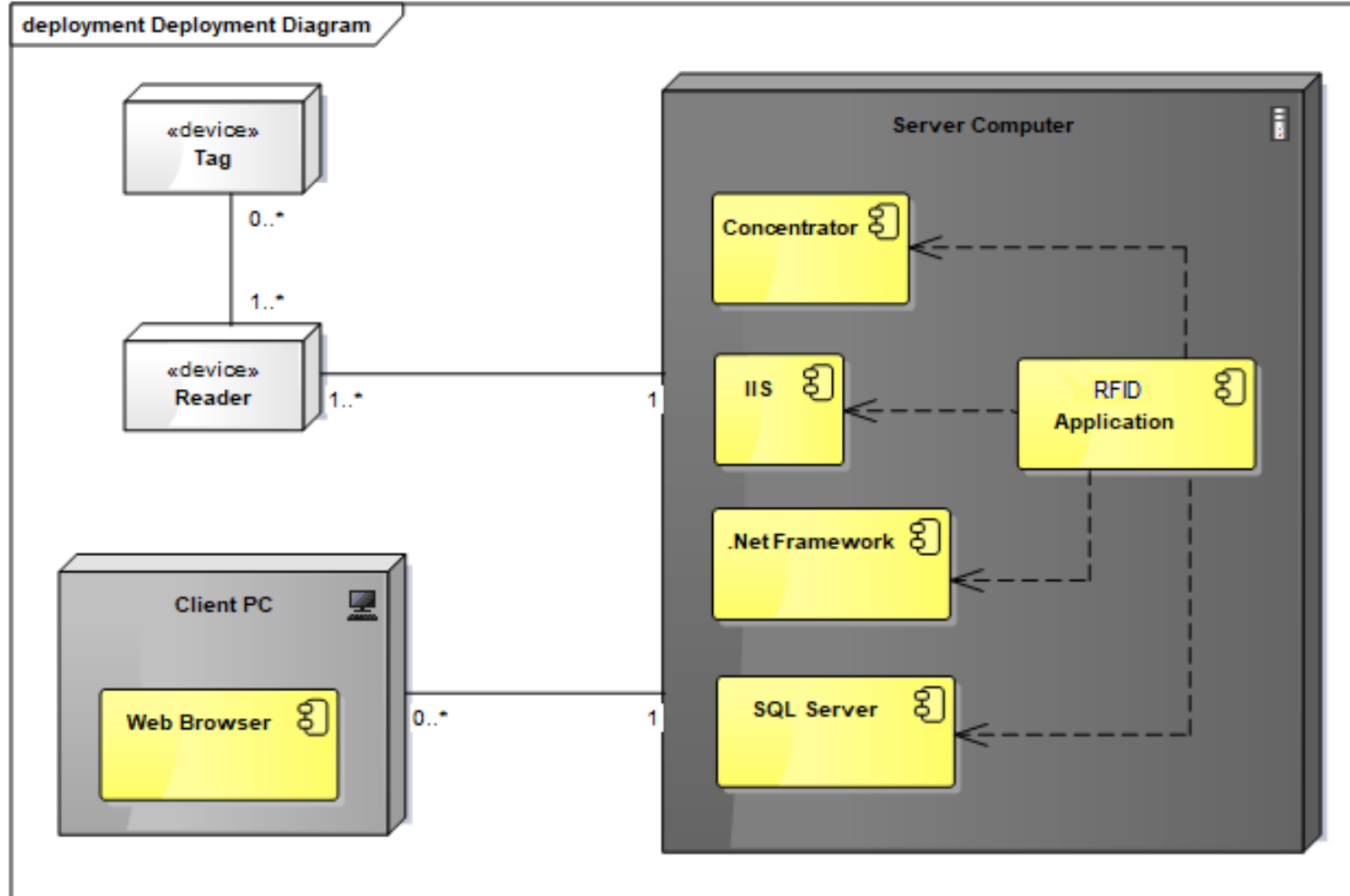
Phase 2: Starting Off

- Complete empowerment to the team
- What must we build?
- Where do we start?
- We have business requirements, but how's it possible?
- We must have UML! Train us!

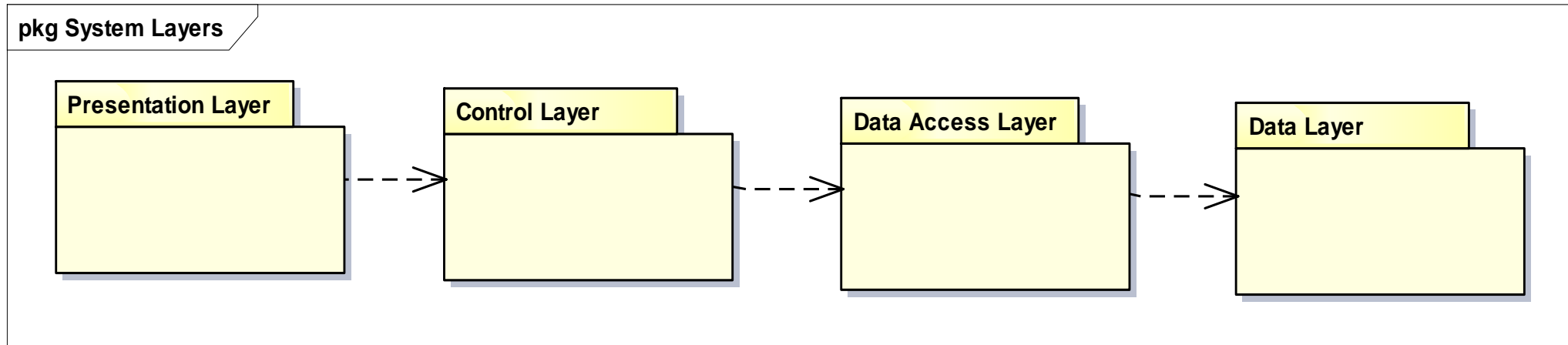
Phase 2: Functionality

- UML
 - Use Case Model
- Functional specifications
- UML
 - Analysis Model
- UI specifications

Phase 2: Deployment



Phase 2: Application Tiers



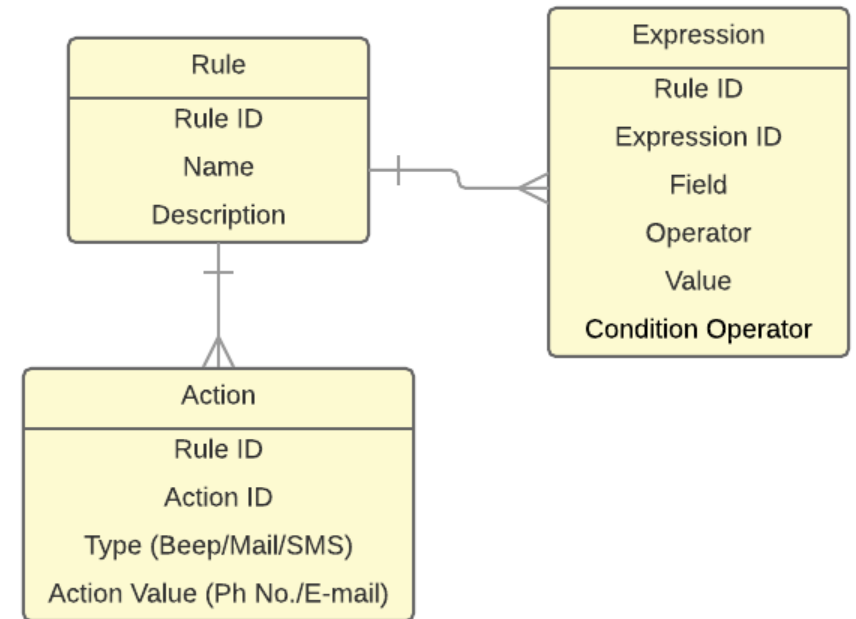
Phase 2: Rules

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Phase 2: Non-Functional Requirements

- No throughput requirements even after query
- Confirmation that focus is to see what throughput can be achieved
- UI personalization

Phase 2: Results

- Unexpectedly satisfying to the client
- Rule execution
 - < 300 rules per second
- Proof that betterment was possible
- New phase commissioned

Phase 3

- Increase rules throughput
- Target 10,000 rules per second
- Not a hard figure

Phase 3: Discussions

- 10,000 rules per second not achievable
- No move to mainframes
- No change to technology stack
- Not a marketable product, but potential client demo material

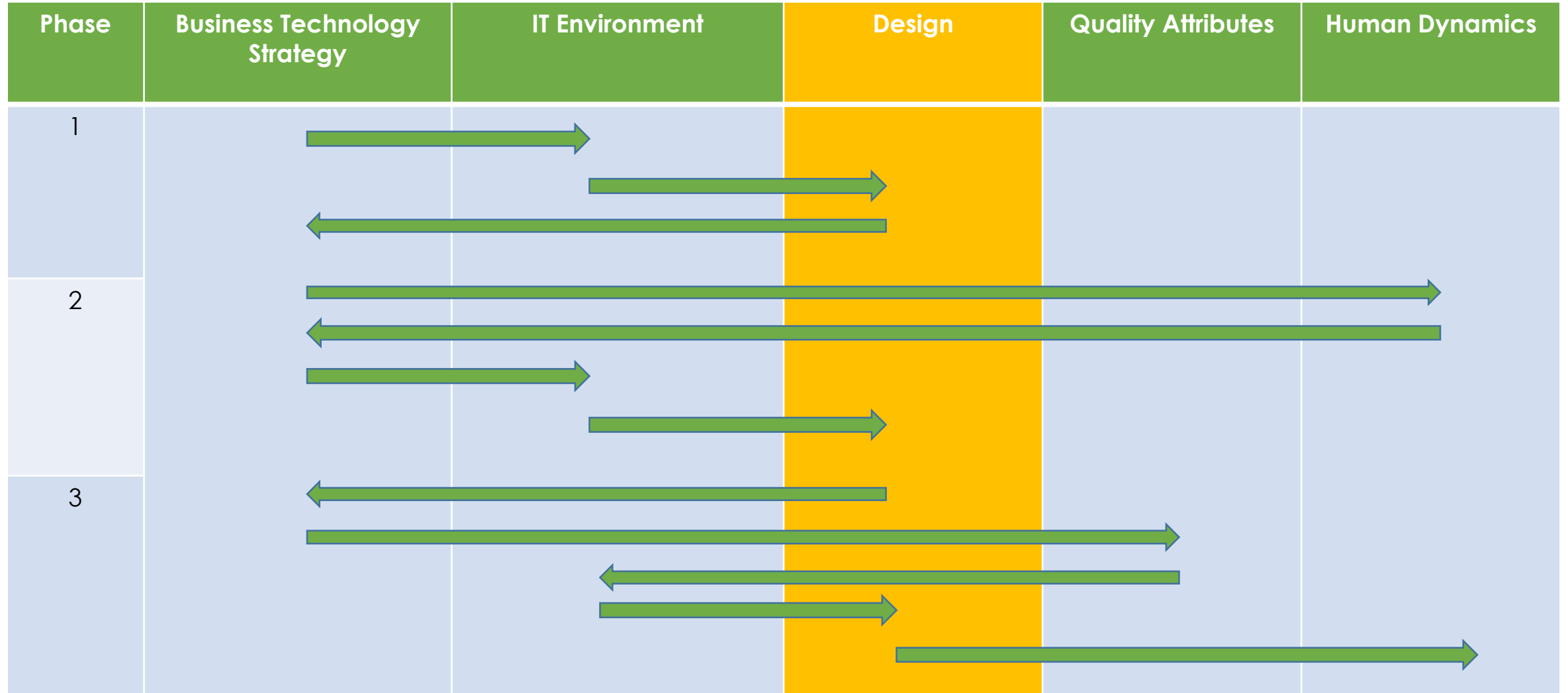
Phase 3: Decisions

- Rules engine to be implemented as Windows service
- Code to be refactored for better performance
- 2 new servers, each running an instance of the Windows service
- Demand for 10,000 TPS down to 3,000 TPS

Traversal Through the Pillars

Phases	Activities	Pillars
Phase 1	Industry analysis	Business technology strategy
	Technology stack finalization	IT environment
		Design
Phase 2	Customer interaction, training	Human dynamics
	Industry analysis	Business technology strategy
		IT environment
Phase 3		Design
	Not a marketable product	Business technology strategy
	10,000 TPS down to 3,000 TPS	Quality attributes
	Extra infrastructure, no mainframes	IT environment
	Windows service	Design
	Negotiations	Human dynamics

Moving Through the Pillars



Learnings

- How the pillars are navigated in each project varies, as seen across phases in the case study.
- Organizational processes affect traversal.
- Looking for a pattern in which to navigate pillars can cause confusion.
- Addressing every pillar is the key.

RFID Asset Tracking System

- After phase 3, project moved out to a mainframe shop
- More than 5 man years of effort
- Seemed like failure
- Client feedback
 - Journey helped solidify perception of reality
 - Resounding success due to the learnings that made them take the step towards mainframe processing

In Closing

- Design is a human process.
- Knowledge of the pillars and their constituents helps ensure everything is addressed.
- The core measure of success is the success of the business technology strategy.
- The design pillar is the key enabler of business technology strategy success.