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Value based Architecture of Digital Product-Service Systems

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TCS Research

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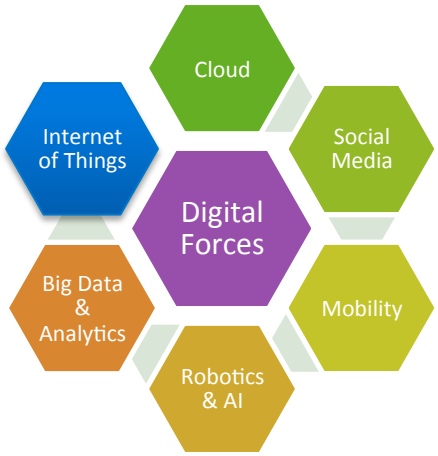
Current Situation

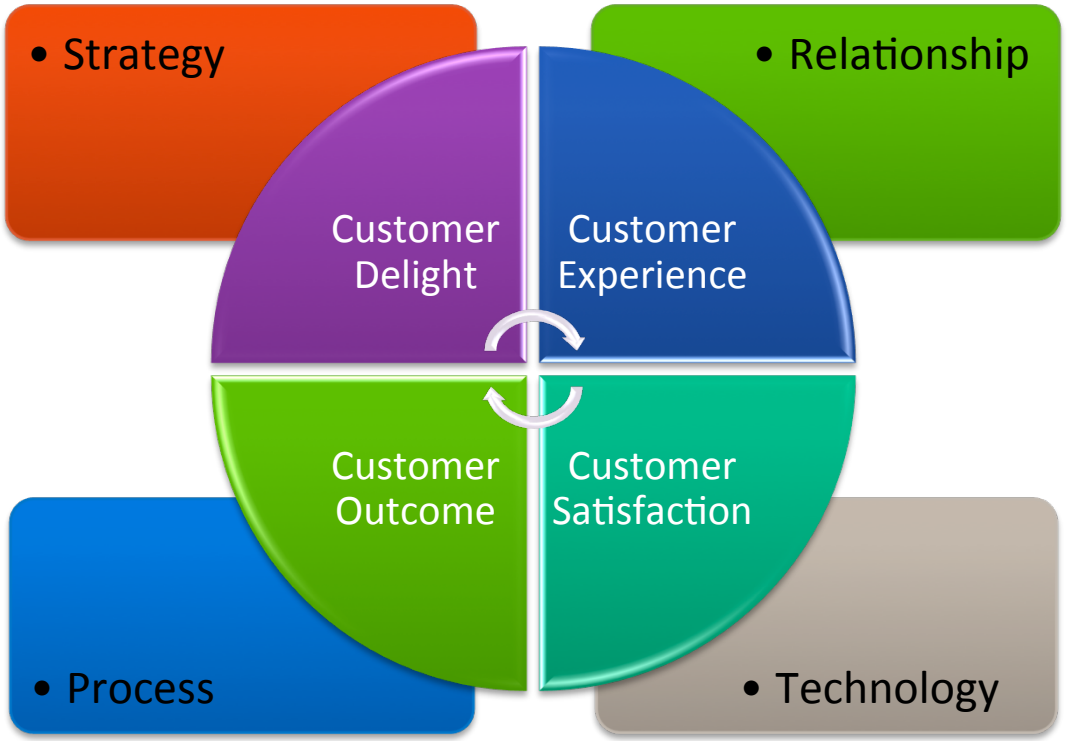
Enterprises	Systems	Services	Software
IT & BP Services	Business	Products	System of Systems

Open Innovation

Open Services Innovation

Business Model Innovation





Design

Engineering

Architecture

Systems

Productization of Services

Servicitization of Products

Digital Product-Service Systems

Motivation

- **"Digital Product-Service Systems"**
  - Integration of people, processes, infrastructure, products, services and digital technologies
    - Independent and operable
    - Networked together for a period of time
    - Formation is not a permanent phenomenon

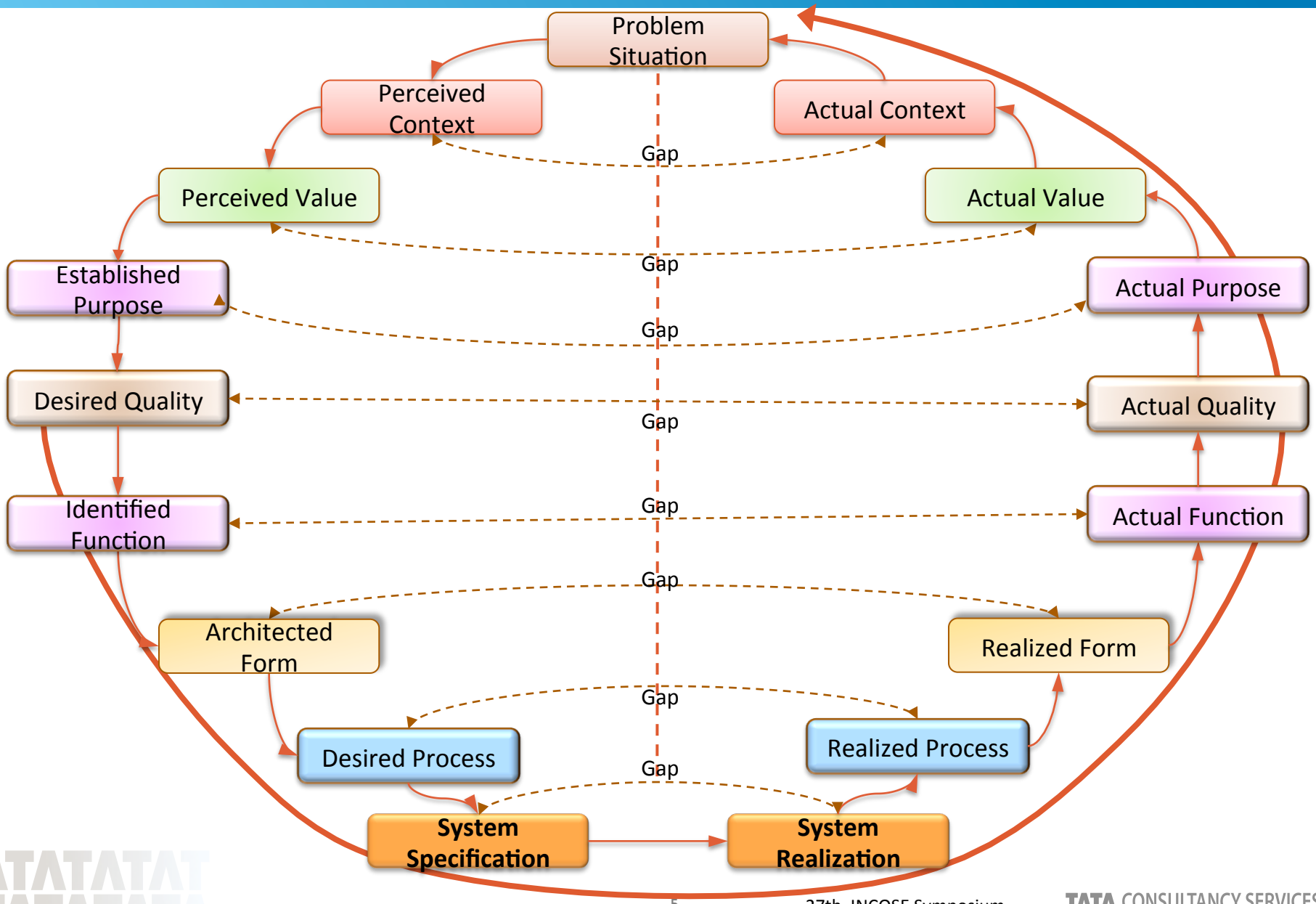
@ an Industrial Scale, ~400,000 Agents, > 20,000 Engagements

Terms and Definitions

- **"Value"** is worth of an offering to a customer, and potentially other stakeholders and is a function of:
  - usefulness in satisfying a need
  - relative importance of the need being satisfied
  - availability relative to when it is needed
  - cost of ownership

- **"Quality"** is a set of essential and distinguishing attributes that have a pragmatic interpretation of the offering's inferiority or superiority

Value Creation Cycle



Value based Architecting Approach

1) Bridge the Product-Service Divide

2) Understand possible evolution

3) Adopt Kano Model

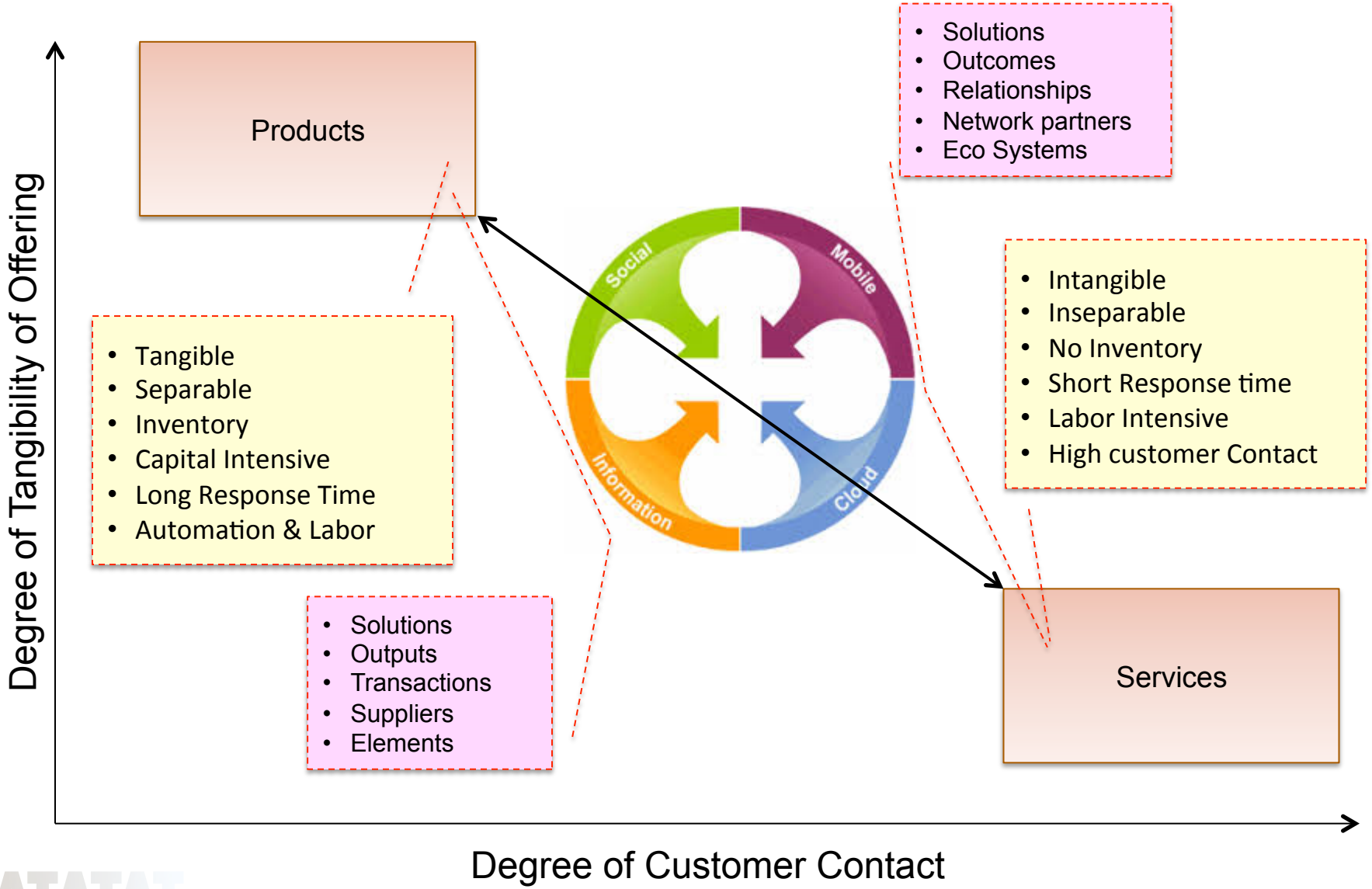
4) Establish Benefits x Value Correlation

5) Establish Value x Quality Correlation

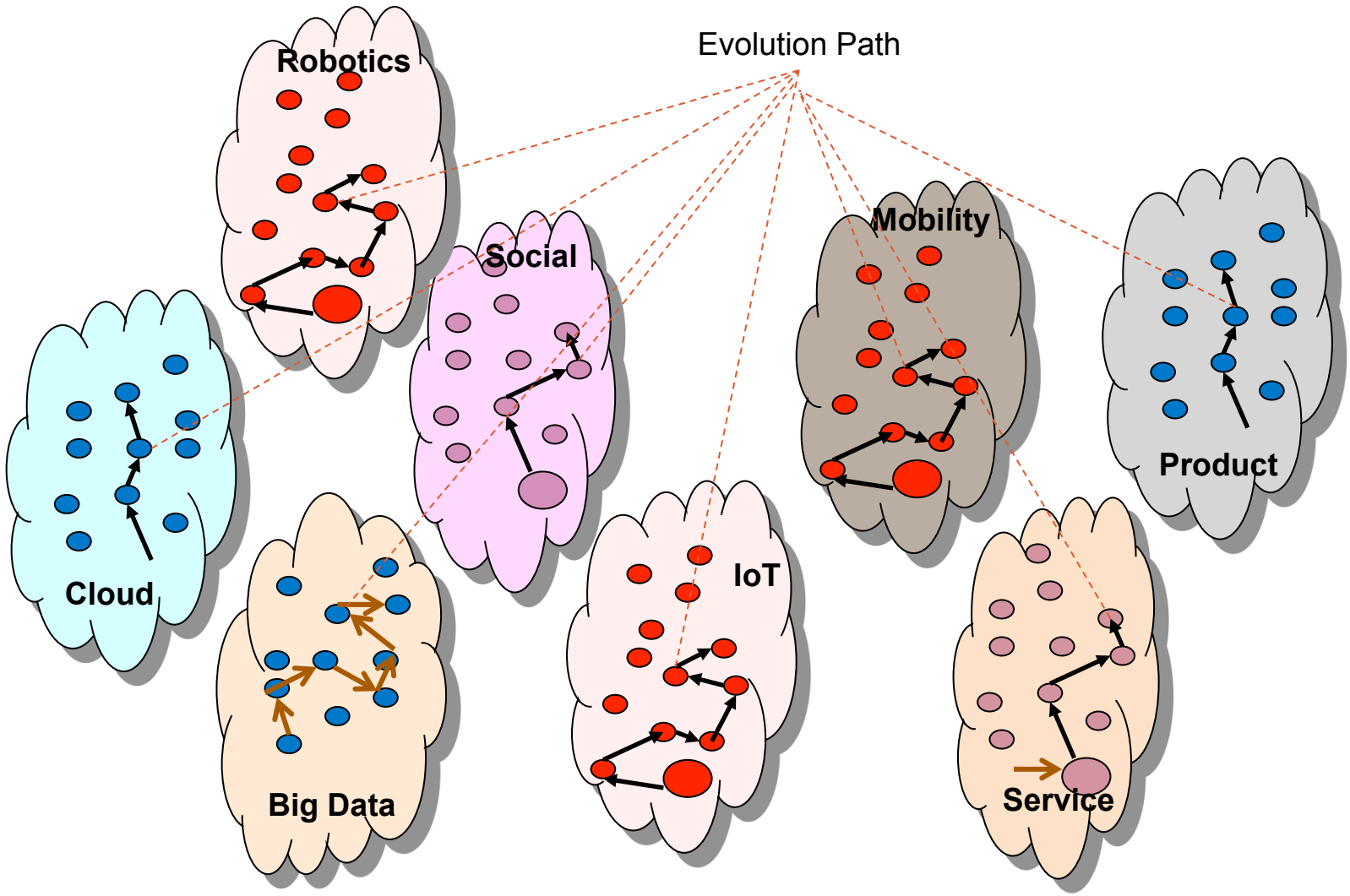
6) Adopt Iterative Value Spiral Life-cycle process

7) Separation of Concerns & Co-create Value

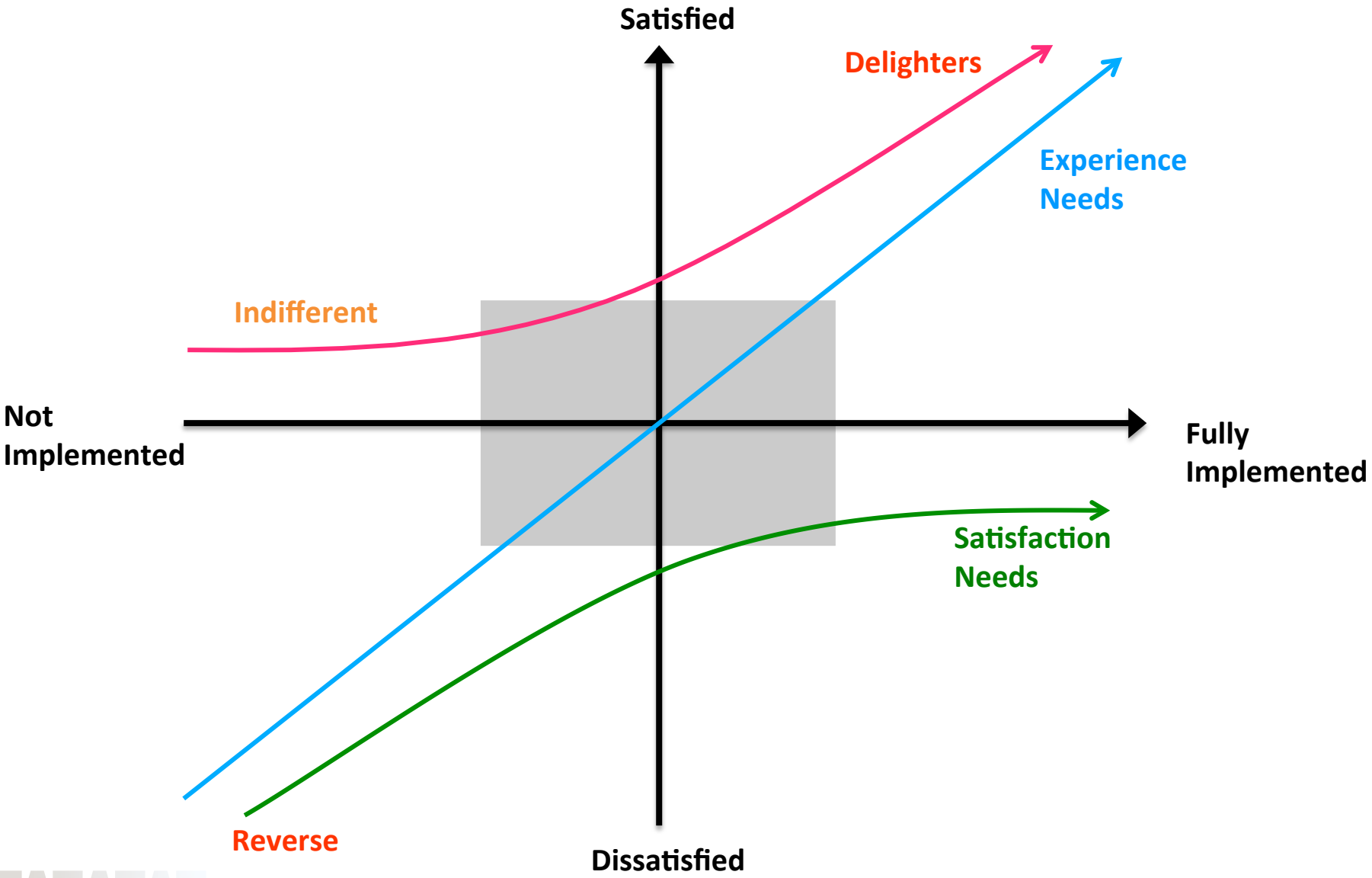
1) Bridge the Product-Service Divide



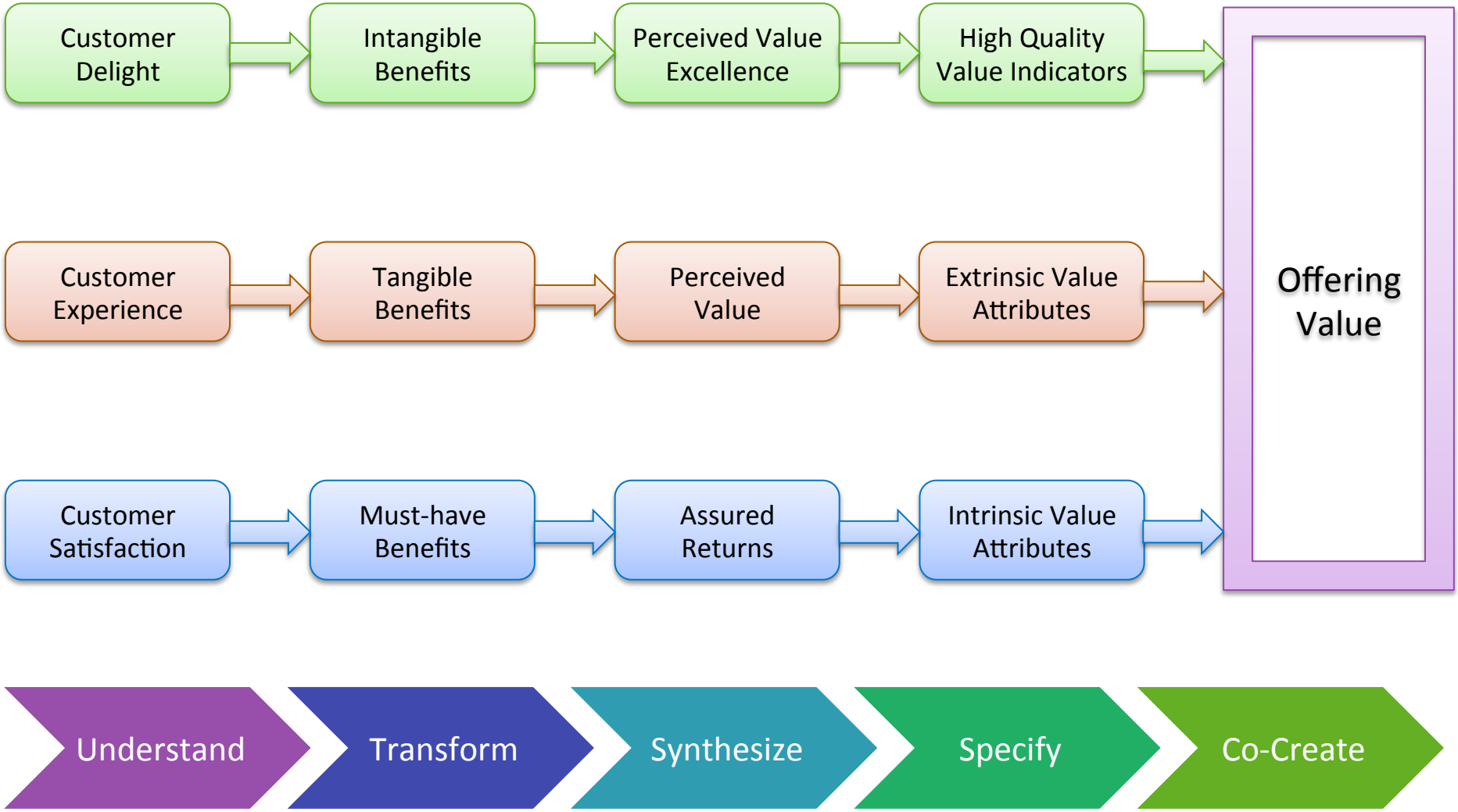
2) Understand Evolution Path



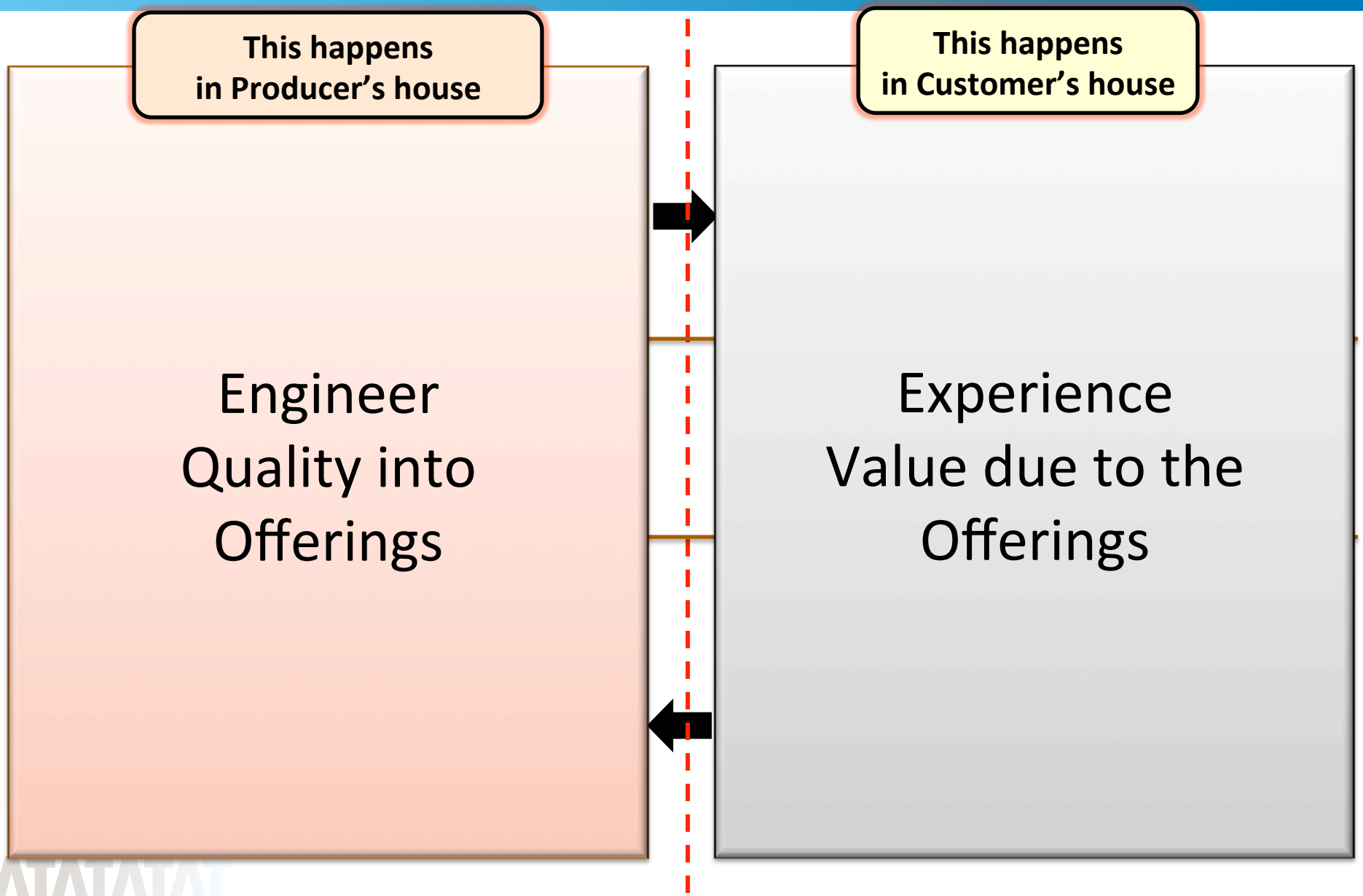
3) Adopt Kano Model



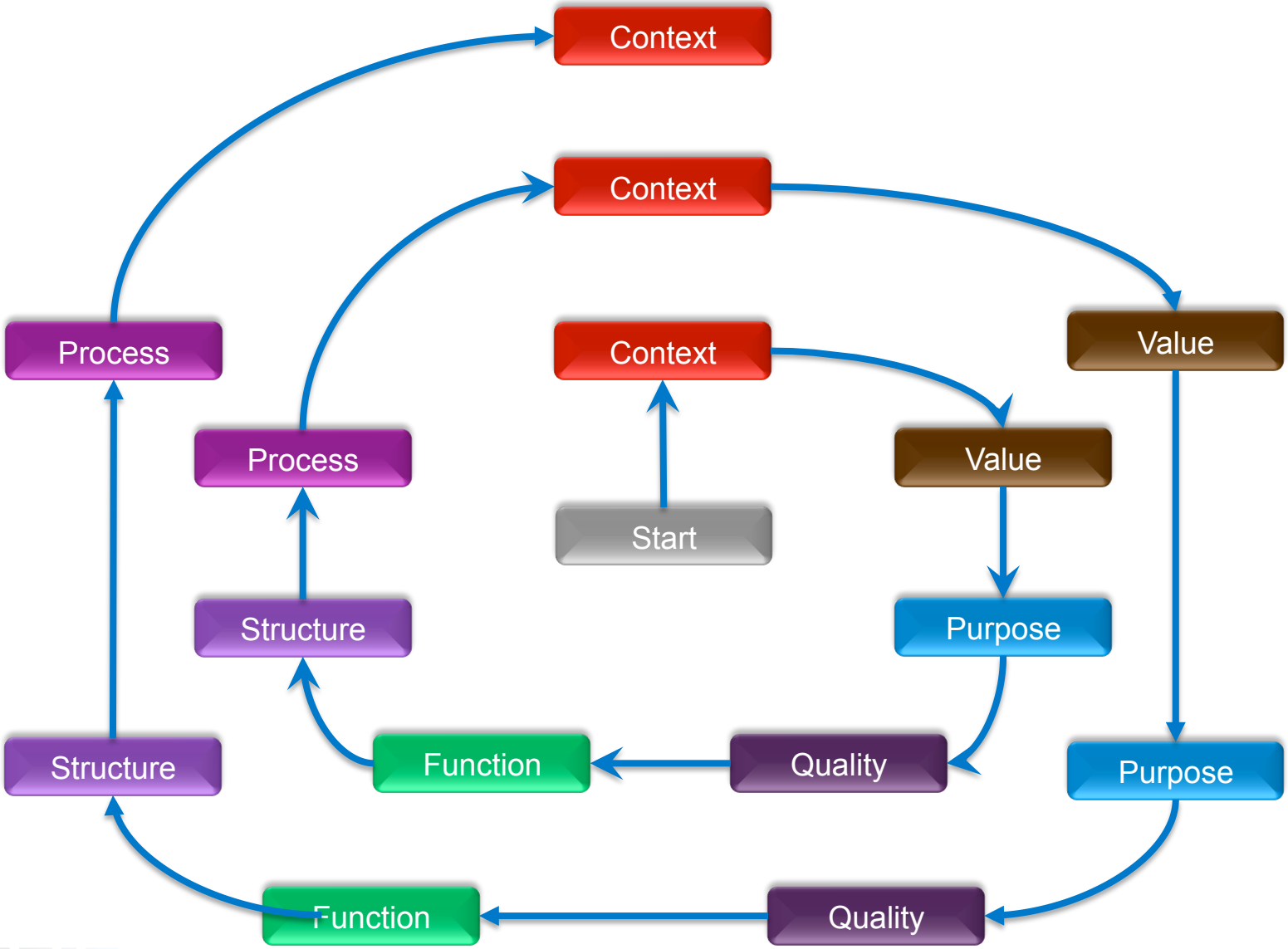
4) Establish Benefit x Value Correlation



5) Establish Value x Quality Correlation

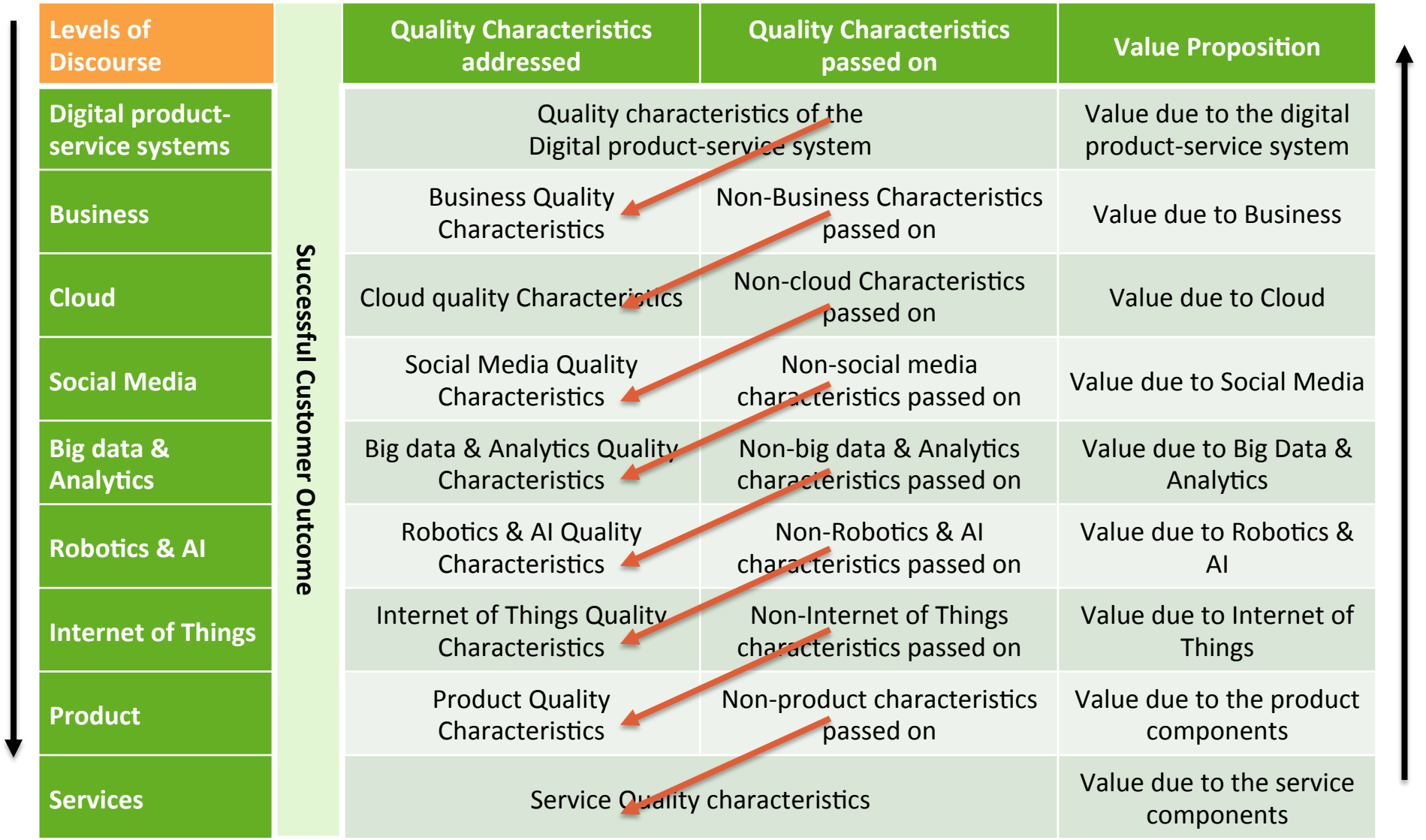


6) Adopt iterative Value Spiral Life-cycle Process



6) Adopt iterative Value Spiral Life-cycle Process

7) Separation of Concerns & Value Co-creation



7) Separation of Concerns & Value Co-creation

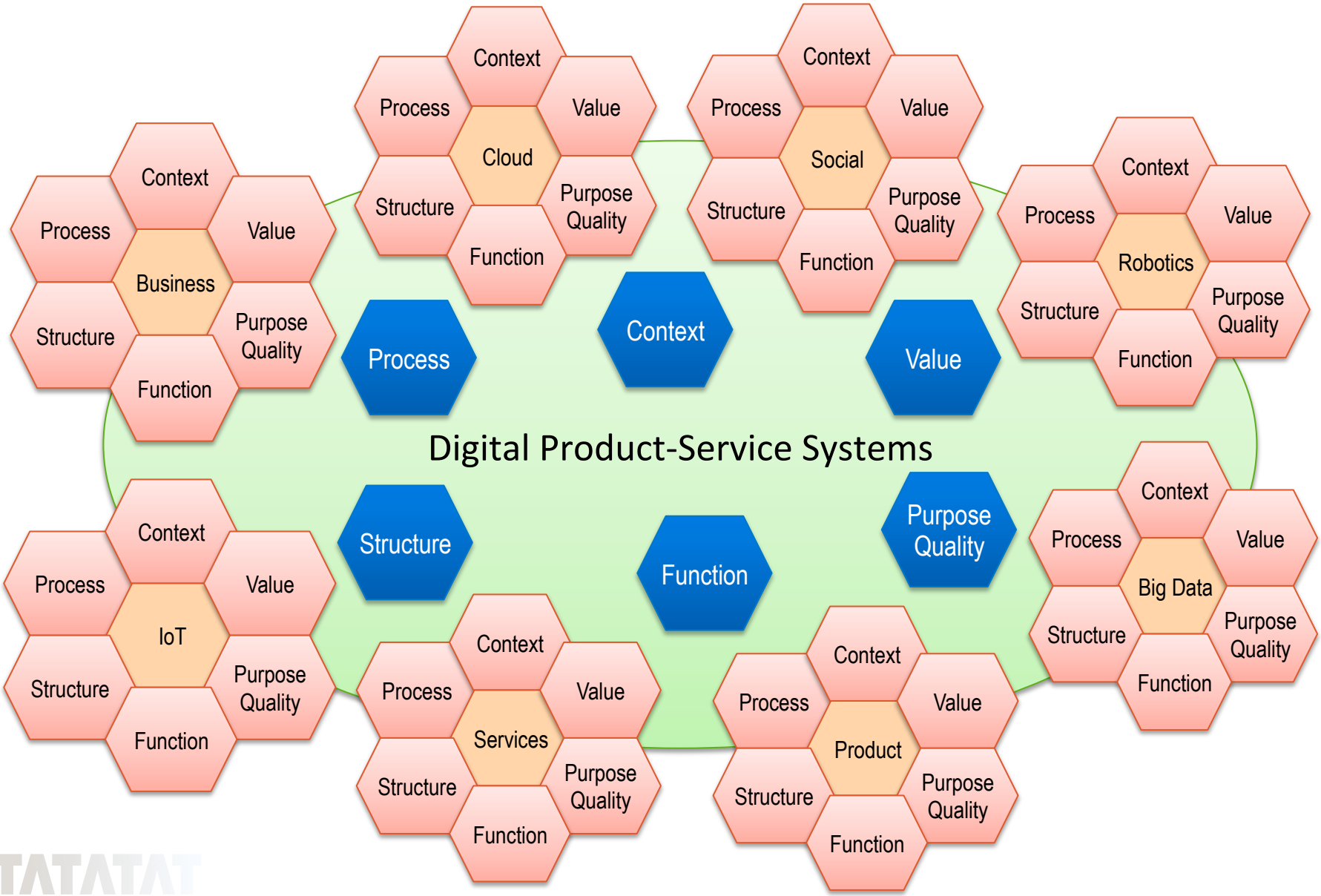


Illustration: Architecture of Event Digital Product-Service System

Context Understanding

- Human Resource Management
  - Identify Challenges, Problems and Issues
  - Human resources utilization planning
  - Identify management approaches
  - Identify policies and procedures
  - Establish selection & recruitment processes
  - Establish training material
  - Identify resources to be trained
  - Establish termination and management processes
  - Train the recruited staff
  - Identify legal considerations

- Conceptualizing the Event
  - Identify Stakeholders
  - Gather Stakeholder needs
  - Identify Trends and Issues
  - Establish Event Theme
  - Identify Sponsors
  - Develop Partnerships
  - Identify Resources
  - Identify Feasibility
  - Identify Unique Elements
  - Develop the Event Concept

Context Understanding

- Marketing
  - Identify what will work and what won't
  - Understand customer decision process
  - Create strategy & principles for branding, pricing, negotiation
  - Plan the Event product-service experience
  - Create strategies for adapting consumer needs
  - Establish relationships
  - Network with Customers & Stakeholders
  - Integrate marketing strategies

- Event Sponsorship
  - Establish Value Proposition
  - Establish Sponsorship Benefits
  - Establish business models to leverage Sponsorship
  - Establish Sponsorship policies
  - Outline stages for implementing event sponsorship
  - Develop strategies and tactics to manage sponsorship relations

Context Understanding

- Project Management
  - Identify management approaches
  - Identify phases of event management
  - Identify knowledge areas involved
  - Identify management board
  - Perform event management
  - Monitor and Measure progress
  - Evaluate, review and establish recommendations
- Control and Budgeting
  - Identify control systems
  - Analyse factors and criteria
  - Identify key elements of control
  - Identify relationships between key elements
  - Understand advantages and shortcomings
  - Understand limits and tolerances

Context Understanding

- Risk Management
  - Identify potential risks
  - Identify role of risk management
  - Establish ways and means to mitigate risks
  - Construct a risk management plan
  - Identify risk management tools
  - Establish risk ownership
  - Understand rules and regulations
  - Establish risk insurance
- Logistics
  - Identify logistics needs
  - Construct a logistics management plan
  - Use event logistics techniques and tools
- Staging
  - Discover & Analyse staging needs
  - Establish event specification and its constituent elements
  - Understand safety elements
  - Identify importance of event elements
  - Use Staging tools
- Evaluation & Reporting
  - Establish metrics and measures
  - Capture metrics and measures
  - Gather necessary information
  - Describe and record impact and benefits
  - Use evaluation/analysis methods
  - Prepare evaluation report

Context Understanding

- Planning
  - Establish management board
  - Establish event objective
  - Understand health and safety
  - Understand time & type of event
  - Identify target audience
  - Plan the advertisements
  - Identify event attractions
  - Identify event requirements
  - Identify accommodation requirements
  - Identify other required services
  - Identify communication requirements
  - Staff the organizers

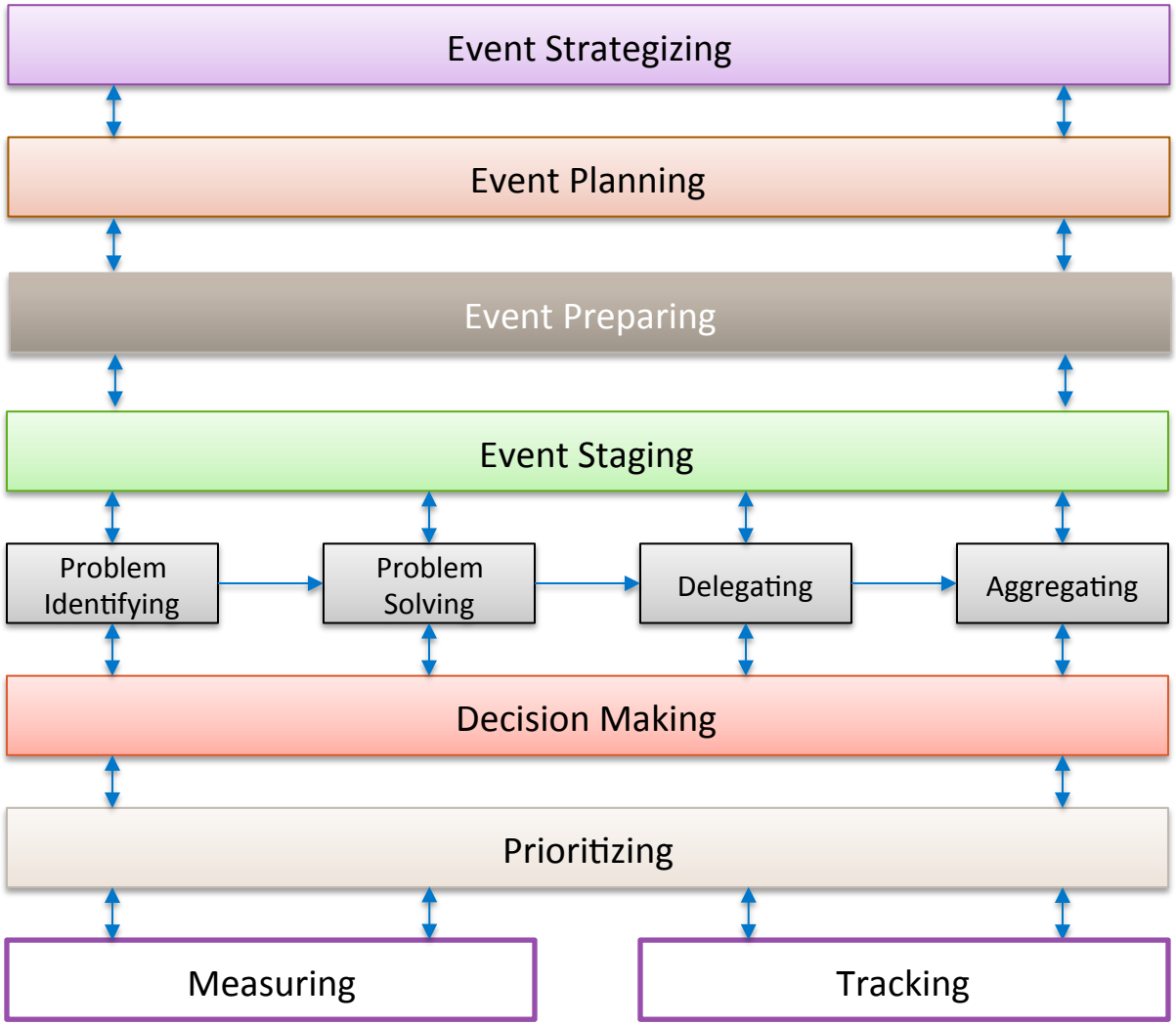
- Planning
  - Identify infrastructure requirements
  - Identify security requirements
  - Identify information requirements
  - Identify insurance requirements
  - Establish emergency and normal procedures
  - Prepare manuals, procedures, principles and guidelines
  - Prepare the budget
  - Identify video/audio requirements
  - Identify site maintenance requirements
  - Prepare the debrief

Context Understanding

- Delivery
  - Establish systematic approach
  - Depersonalize the event
  - Facilitate clear communication
  - Conform to agreed upon delivery methodology
  - Ensure accountability
  - Increase visibility
  - Track overall event progress
  - Collect delivery metrics
  - Obtain key performance indicators

- Delivery
  - Collect Data
  - Perform action items
  - Handover responsibilities
  - Make decisions
  - Look at alternatives
  - Trade-off and compromise, if necessary
  - Manage Resources
  - Generate progress reports
  - Maintain contact lists
  - Support communication protocols

Context Understanding



- Typical Phases
  - Initiation
  - Scoping
  - Planning
  - Integration Management
  - Time Management
  - Cost Management
  - Quality Management
  - Resource Management
  - Communications Management
  - Risk Management
  - Services Management
  - Suppliers Management

Underlying Assumptions

- To achieve successful Event outcome:
  - Multiple entities need to be networked together for a period of time, based on a plan
  - Multiple stakeholders need to be brought together for a common agenda
  - Multiple services need to be orchestrated for a period of time, to achieve a larger objective
  - Multiple service providers need to be co-ordinated for a period of time
  - People, process, technology should be orchestrated correctly to achieve a successful outcome!
  - Time spent planning >>> Event time

Key Stakeholders & Concerns

- Host
- Host Community
- Participants
- Service Providers
- Sponsors
- Customers

Potential Benefits

- Financial (Budget, Expenditure, Investments, Costs, Economic goals, Brand Value, …)
- Social and Cultural (Feeling, Pride, Prestige, Social Inclusion, Shared experience, Participation, …)
- Environmental (Waste, water & logistics, going green, best practices, carbon-footprint, sustainability, …)
- Business (Opportunities, Commercialization, Innovation, Competency & Skills, Collaboration, …)
- Economic (ROI, Revenue, Profits, Higher yield, …)
- Infrastructure (modernization, capabilities, legacy, facilities, …)
- Health (Happiness, Wellness, Satisfaction, Equity, Community, …)

Value Proposition

Host

- Smartest way to conduct events

Host Community

- Encourage, recognize and showcase innovations and skills

Participants

- Inspiring opportunities to make a difference

Service Providers

- The best place to be imaginative

Customers

- One shop for solving every problem

System Purpose

- Enhance event experience by providing a process platform that facilitates event life-cycle management

Quality Characteristics

Complexity

- Size, Scale, Scope, Cost, Network, Agenda

Commonality & Variability

- Processes, Stakeholders, Beneficiaries, Expectations, Success Criteria, Incidents

Multi-Disciplinary

- Hospitality, Logistics, Socialization/Networking, Project Management
- Services, Learning & Growth, Mass Communication, Multi-media
- Marketing, Branding, Resource Management, Entertainment

Differentiators

- Innovate, Imagine and Inspire
- Experience, Moments of Magic & Satisfaction

Periodicity

- Regular, Adhoc, Special, Once-in-a-lifetime, Milestones

Quality Characteristics

Different Types

- Conferences, Meetings, Customer visits, Project discussions
- Innovation forums, Traditions, Festivity

Different Agendas

- Knowledge, Business, Entertainment, Review
- Exhibition, Fair, Sales, Marketing, Show-casing

Different Kinds

- Mega-event, Local, Special, Hallmark
- Routine, Cultural, High-profile, Sports, …

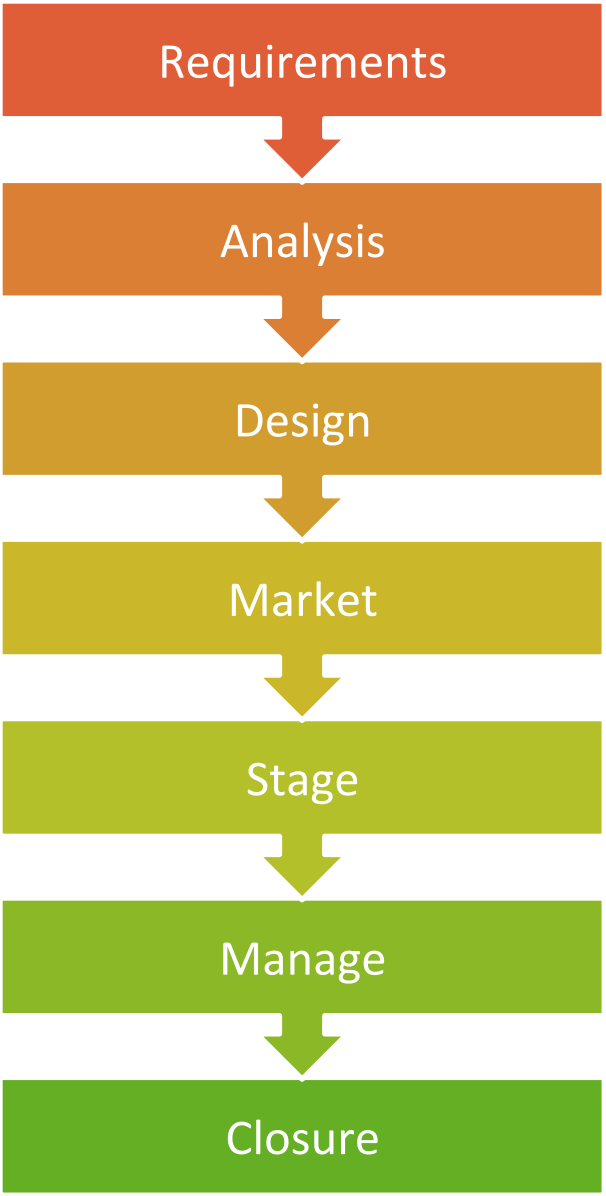
Different Purposes

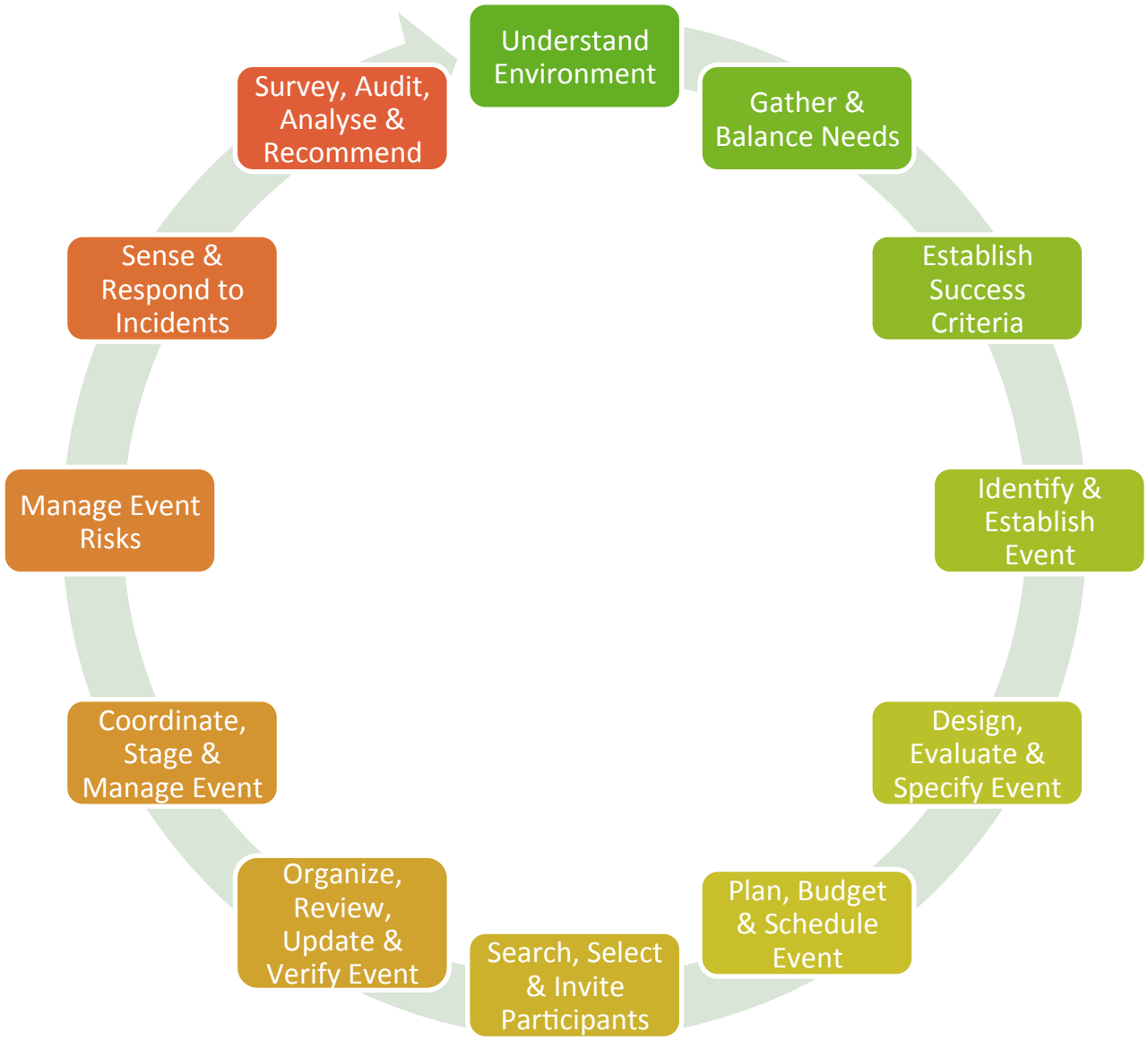
- Entertainment, participatory, problem solving, consultation
- Educational, problem solving, exchange ideas, exchange views/opinions

Different Strategies

- Customer-Focus, Market-Focus, Offering-Focus, Vision-Focus, Outcome-Focus,...

Solution Snippet – Event Life-Cycle





Solution Snippet – Event Life-Cycle Processes

Event Management Processes

- Planning Process
- Decision Management Process
- Assessment Process
- Risk Management Process
- Control Process
- Configuration Management Process
- Quality Assurance Process
- Information Management Process
- Budgeting Process
- Measurement Process
- Strategizing Process
- Inspection Process

Enablement Processes

- Infrastructure Management Process
- Portfolio Management Process
- Resource Management Process
- Quality Management Process
- Technology Management Process
- Knowledge Management Process
- Product-Service Management Process
- Documentation Management Process

Agreement Processes

- Acquisition Process
- Negotiation Process

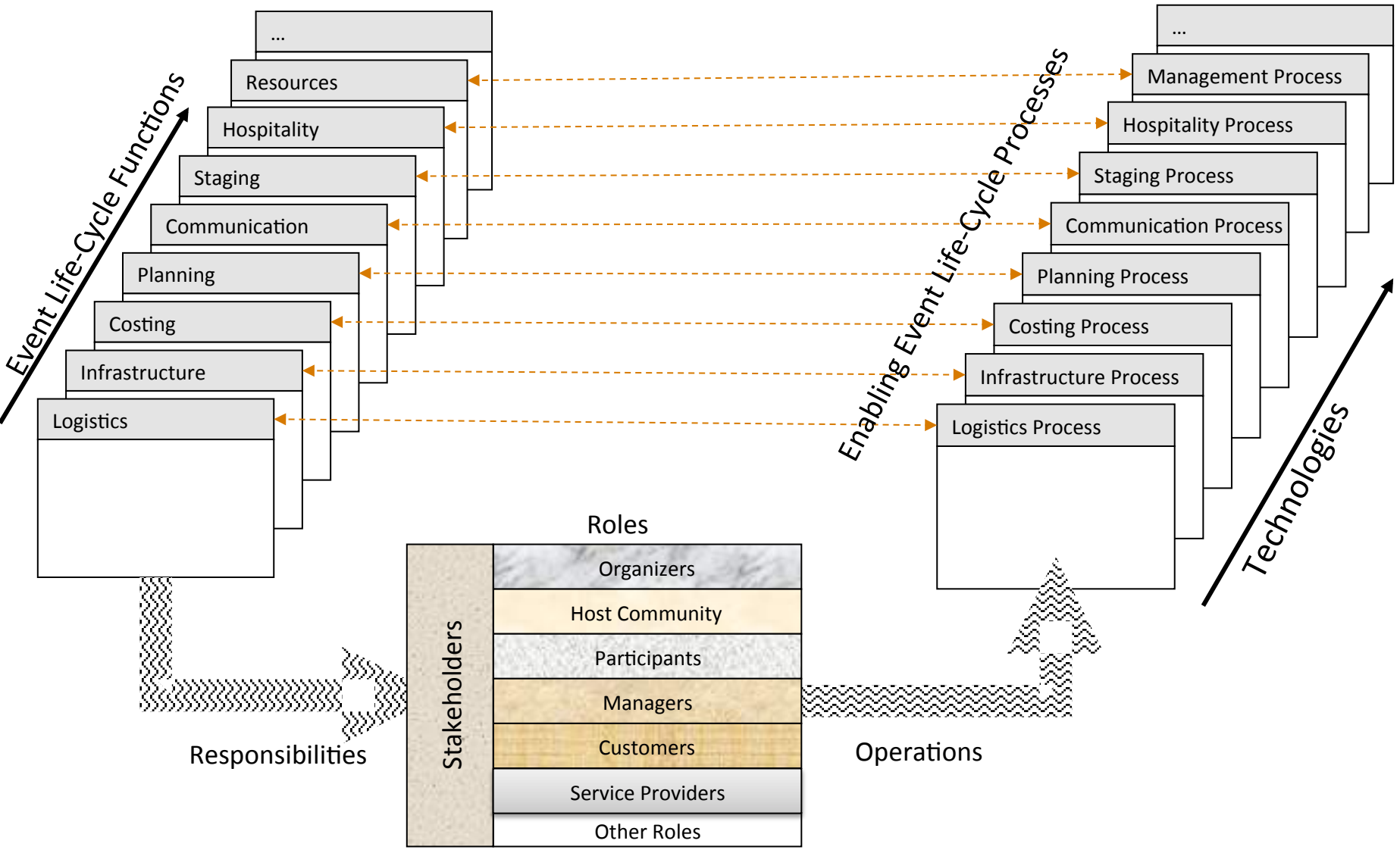
Event Technical Processes

- Business Analysis Process
- Event Requirements Definition Process
- Event Design Process
- Event Detailing Process
- Event Analysis Process
- Event Implementation Process
- Verification Process
- Validation Process
- Staging Process
- Delegation Process
- Maintenance Process
- Closure Process

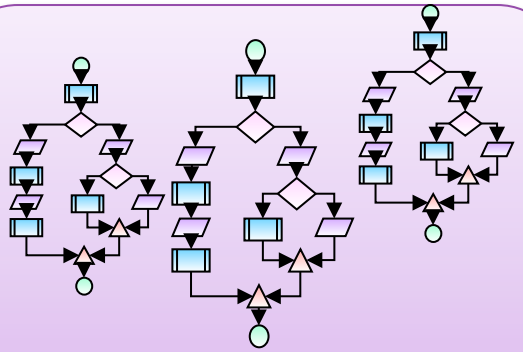
Service Provider Processes

- Service Definition Process
- Service Quality Definition Process
- Service Delivery Process
- Service Consumption Process
- Performance monitoring Process
- Service Escalation Process

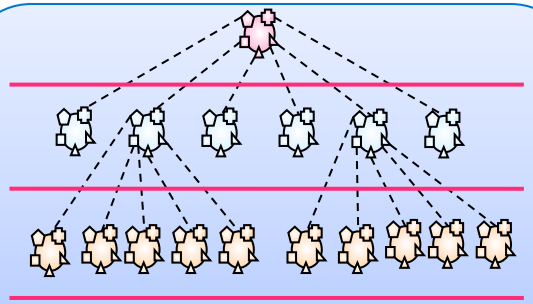
Desired Function – Enabling Events



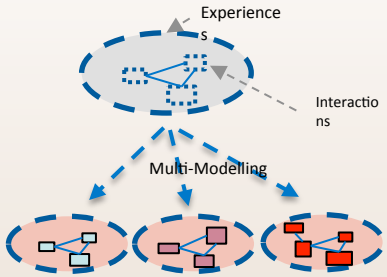
Architected Form – Event Modelling



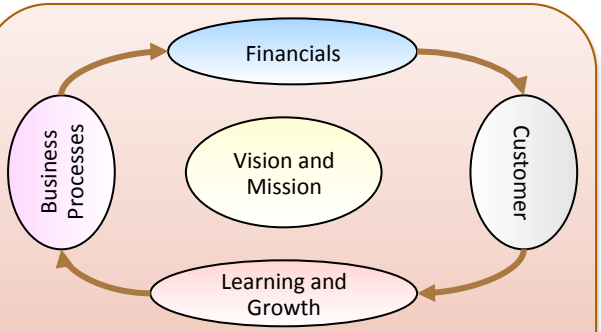
Process Models



Work Breakdown Structure



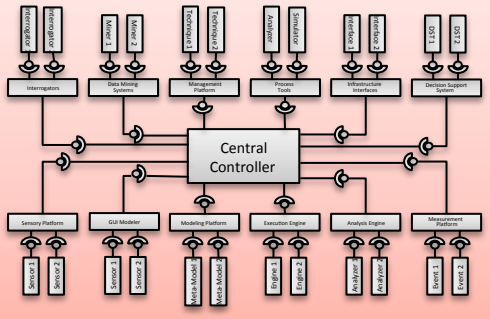
Experience Models



Management Models

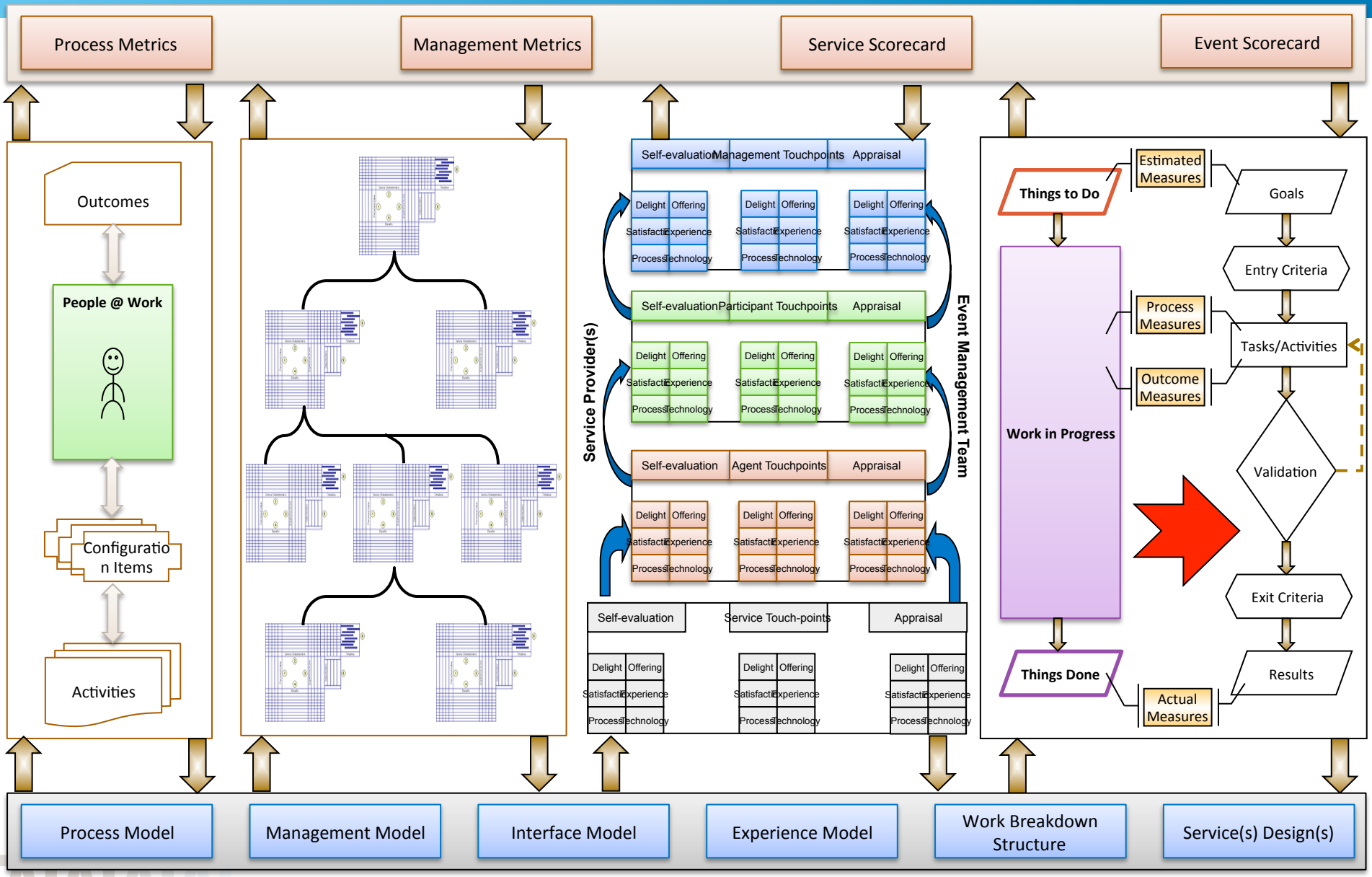
Service Blueprint Components	
Physical Evidence	
Customer Actions	Line of Interaction
Onstage/Visible Contact Employee Actions	Line of Visibility
Backstage/Invisible Contact Employee Actions	Line of Internal Interaction
Support Processes	

Service(s) Design(s)

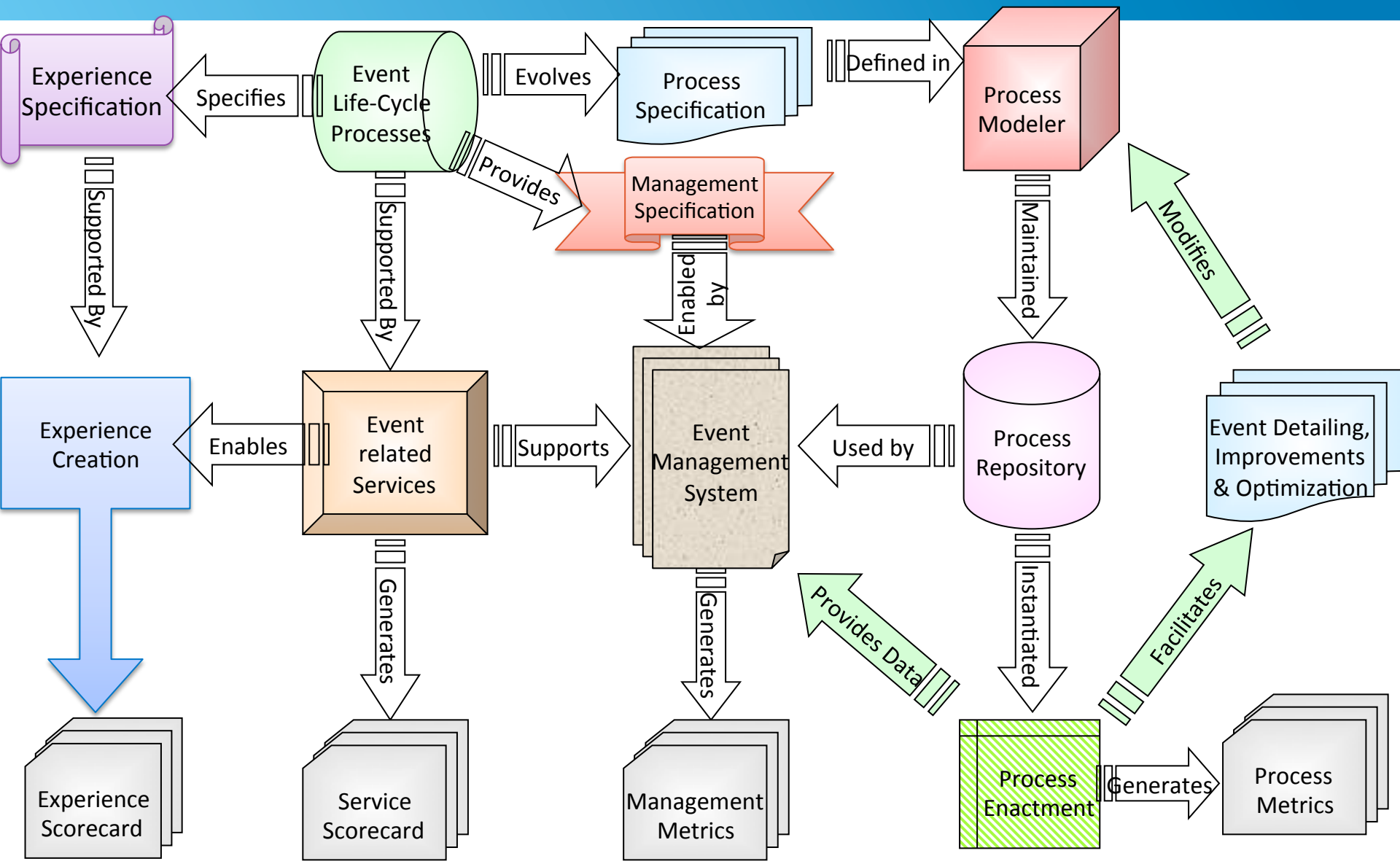


Interface Models

Architected Form – Event Orchestration



Underlying Process



Conclusion – Key Ideas

- **"Digital Product-Service Systems"**
  - Integration of people, processes, infrastructure, products, services and digital technologies for a specific period of time
    - Formation not a permanent phenomenon

- **"Value based Architecting Approach"**
  - 1) Bridge the Product-Service Divide
  - 2) Understand possible evolution
  - 3) Adopt Kano Model
  - 4) Establish Benefits x Value Correlation
  - 5) Establish Value x Quality Correlation
  - 6) Adopt Iterative Value Spiral Life-cycle process
  - 7) Separation of Concerns & Co-create Value

Future work

- Technologies to Support Architecture of Digital Product-Service Systems

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Thank You

