

# The Enterprise Services Transformation Roadmap<sup>SM</sup>

## Building a Real World Services Architecture



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## LiquidHub & QVC

July 13, 2005

# Agenda

- Building a Real World Services Architecture
- Services Architecture Approach at QVC
- Practical Enterprise Services Transformation



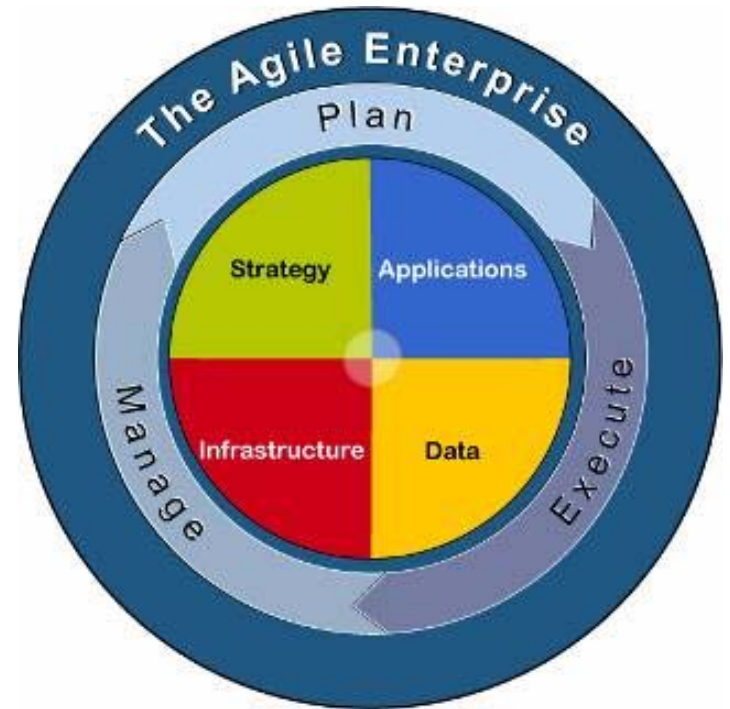
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# Building a Real World Services Architecture

Robert T. Kelley  
Partner  
LiquidHub

# About LiquidHub

- LiquidHub is a systems integrator and technology consultancy focused on enabling the Agile Enterprise through our Strategy, Applications, Data, and Infrastructure solutions and an engagement lifecycle of planning, execution, and management.
- Our approach helps our clients integrate new technology frameworks with enterprise and legacy systems, delivering Enterprise and Service Oriented Architectures, Web Services, Enterprise Integration, Enterprise Portals, Data and Content Management, and scalable Applications and Security Infrastructures.
- With offices in Philadelphia, Boston, and Hyderabad, India, our more than 200 associates serve clients in Life Sciences and Healthcare, Financial Services and Insurance, Retail, Technology and other key industries globally, at our sites or theirs.

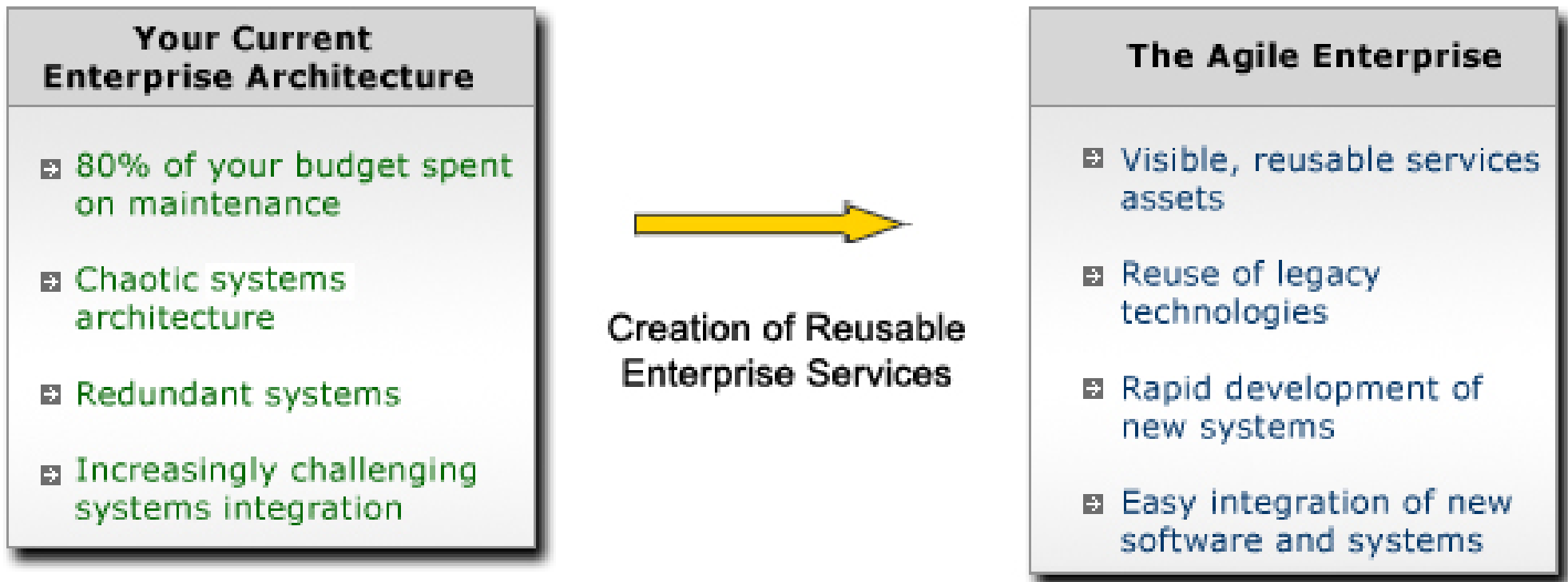


# Your Current Environment and the Promise of Enterprise Services

- The lure of Service Oriented Architecture and reusable enterprise services is based on the fact that most organizations face difficult and persistent IT challenges . . .
  - Not always able to rapidly respond to market conditions, competition, and the pressure to innovate.
  - Can't easily implement new technologies without redesigning your whole environment, while making sure your investment won't become obsolete.
  - Often face rising IT maintenance costs and systems integration complexity.
  - Need to be able to plan, execute, and manage IT in a way that makes the most of your IT investments—now and in the long term.

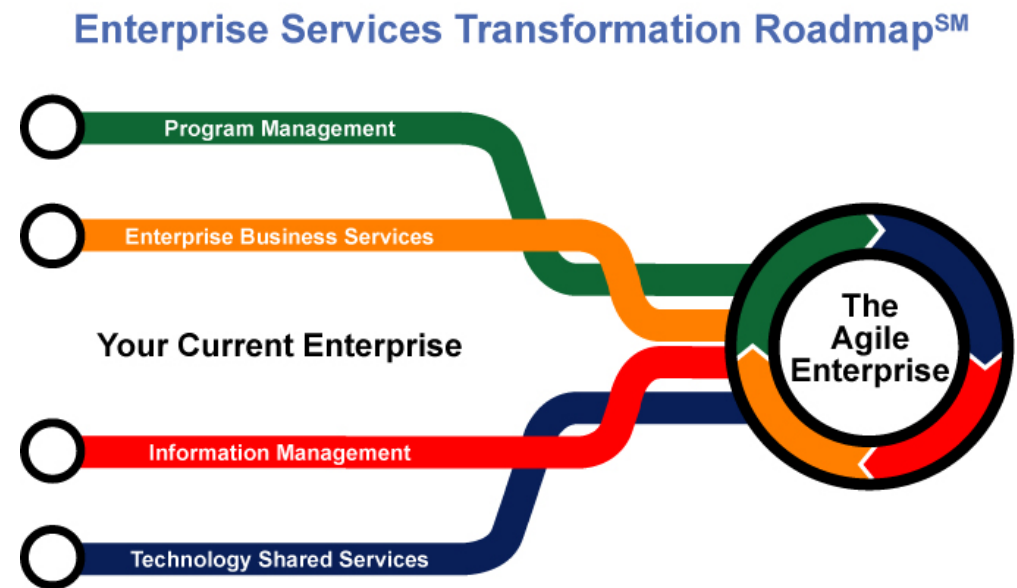
# Reusable Enterprise Services and the Agile Enterprise

- What organizations need is a way to get from their current Enterprise Architecture to one that allows them to become an Agile Enterprise



# LiquidHub provides the Roadmap to the Agile Enterprise

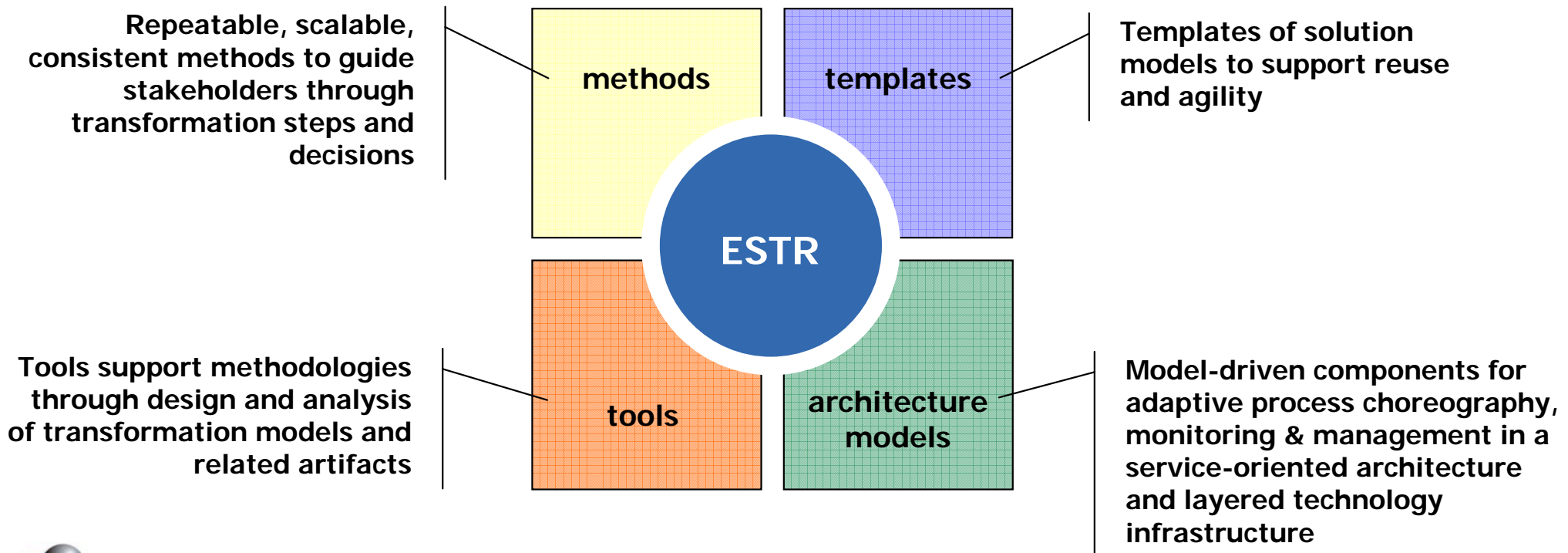
- LiquidHub's Enterprise Services Transformation Roadmap (ESTR) helps organizations plan for technology simplicity and reusability, providing a roadmap to the Agile Enterprise.
- ESTR is an incremental strategy and planning process that identifies and leverages the value of existing IT system assets while delivering a flexible technology architecture that will work long-term.
- Based on the principles of Enterprise Architecture and Service Oriented Architecture, ESTR provides LiquidHub's clients with a clear process for evaluating business needs, identifying existing technology and process assets, and planning the implementation and integration of new technologies in a way that ensures technology reuse and lower total cost of ownership.



# Enterprise Services Transformation

**Enterprise Services Transformation** is an Enterprise Architecture driven approach to incrementally transform the IT assets of an organization into a shared service oriented model, an Enterprise Services Architecture.

The **LiquidHub Enterprise Services Transformation Roadmap** provides a process for the controlled, stepwise evolution of an Enterprise Architecture to a Services Oriented Architecture with reusable services that work in a heterogeneous technology environment





# Services Architecture Approach at QVC

Sharon Hemler  
Director of Enterprise  
Application Services  
QVC



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# Historical Perspective

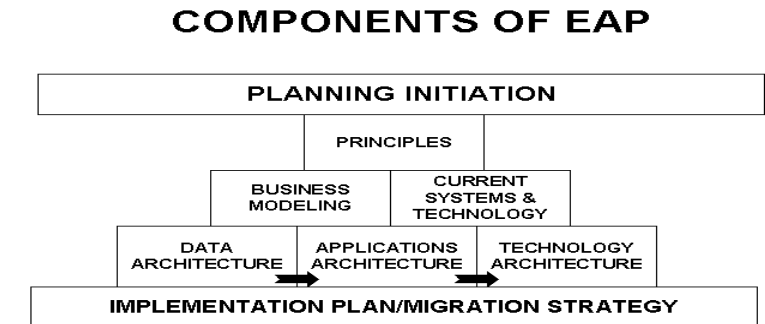
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# Why Enterprise Applications?

- **Replace all 'End of Life' systems on a worldwide basis while maintaining exceptional customer experience**
- **Reduce data redundancies in support of consistent management reporting.**
- **Deploy applications that support QVC's business model across all markets.**
- **Manage system enhancements while continuing to support business growth**
- **Used enterprise architecture to investigate how to solve business issue**
  - Plan was to replace 90 - 95% of all systems worldwide
  - There are 100 major projects to be delivered over three years
  - Project include a combination of packages and custom development
  - All systems developed with technologies from QVC's 5 Year Technology Plan
  - All existing staff require training in these new technologies

# Historical Perspective

## Q1 2003 – Enterprise Architecture



## Q2 2003 - Enterprise Decision Made To Meet business challenges

### Q3 – Q4 2003

- Assistance required to design and build applications engaged external vendors
- Further refined and reorganized Business Model to Task level
- Developed Legacy Application Inventory
- Partnered on creating new OOAD methodology and artifact templates

# Historical Perspective

## Q1 2004

- Data Strategy pre-requisite to Applications; defined Corporate Data Store Requirements; Completed Functional Designs for Stores
- Started Source vs. Target Mapping of Legacy Data
- Kick-off of Rational Tool and Process Project

## Q2 – Q3 2004

- IT Planning session with International, Began evaluation of International alternatives for support beyond 2006

## Q4 2004

- Completed Training tracks and Rational Toolset rollout for 120+ Apps Dev team members
- Collaborative review of what was working and suggested improvements
- New Enterprise Application Services (EAS) Team Announced to support, provide direction, best practices and guidance for Enterprise Applications



## ***SOA Defined***

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# Definition

Service-Oriented Architectures (SOAs) are an approach to enterprise business systems architecture that expose resources as services while hiding the underlying implementation .

A service is a single or composite component that exposes/implements a particular business process. The collection of enterprise services comprises the SOA.

In an SOA, resources are made available to other participants in the network as independent services that are accessed in a standardized way.

In general, Service Oriented Architectures are:

- Based on open standards
- Promote loosely coupled applications
- Promote structured document exchange
- Promotes location transparency

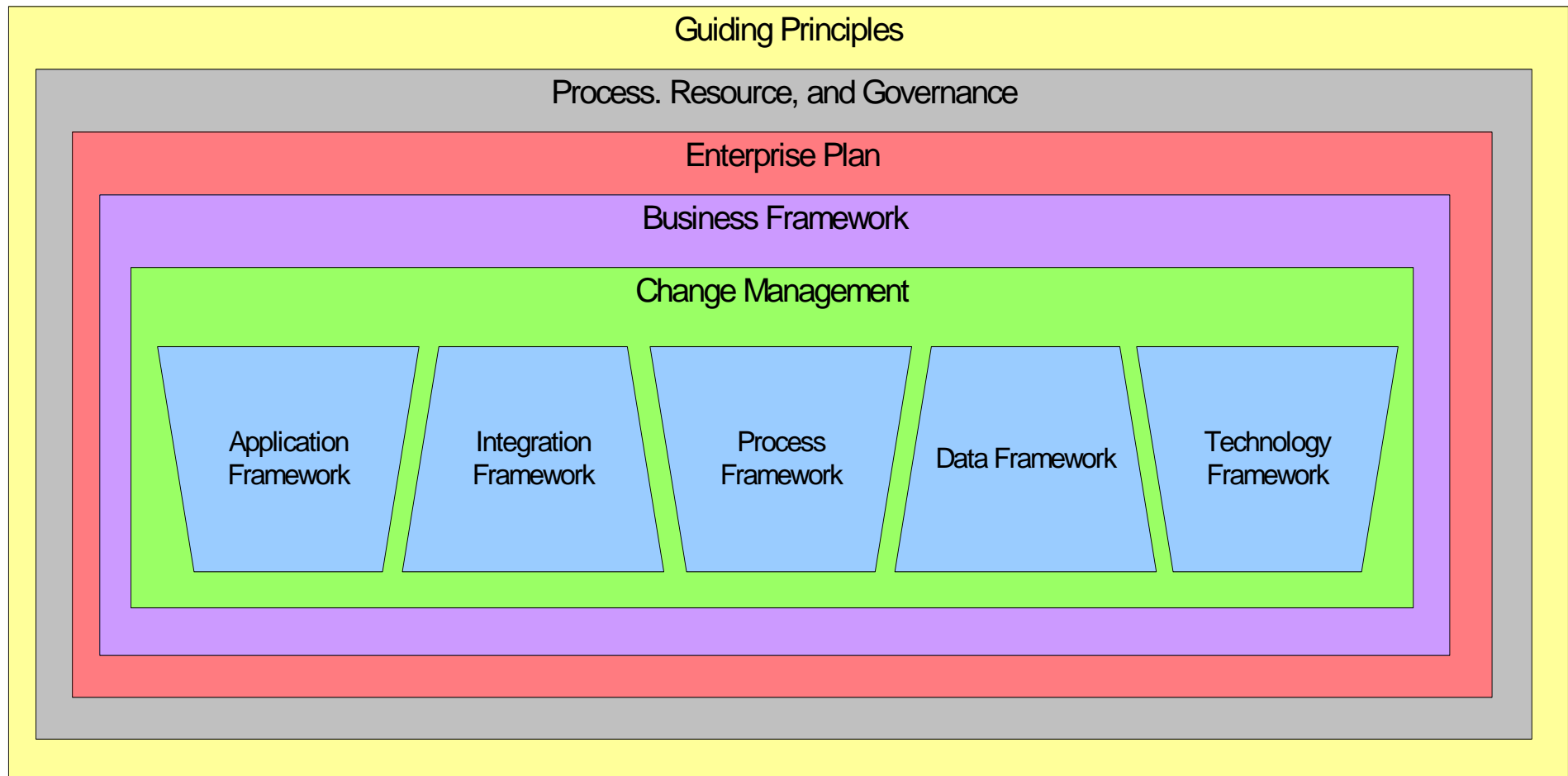


## ***Future State***

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# Future State Vision

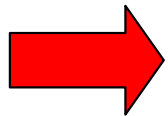
**The Future State Vision encompasses the following key areas...culminating in the support of the enterprise plan...driven by the guiding principles...and supported by the technology 5 year plan.**



# Future State Vision – Business Framework

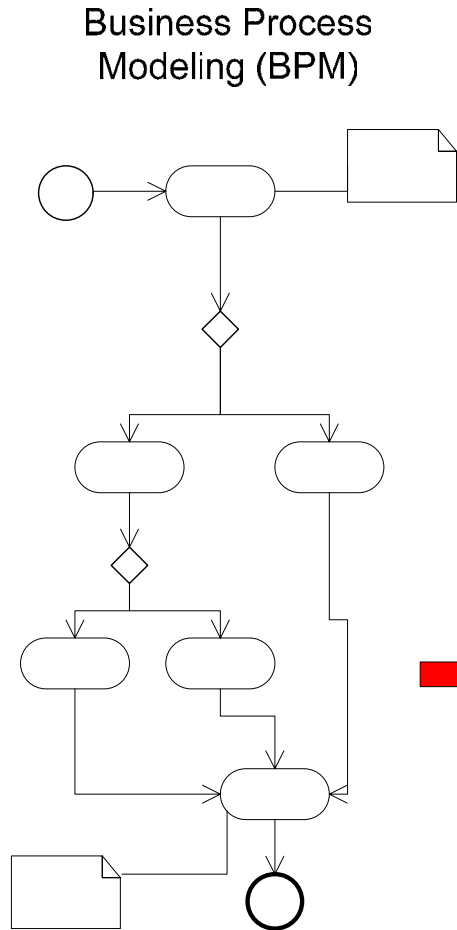
## The future state business framework consists of the following:

- QVC Business Models (Static Model and Process Model)
- Enterprise Actor Catalog
- Essential Use Case Model
- Enterprise Domain Object Model
- Enterprise Data Dictionary



The outcome of this analysis is a list of Common Business Services, their dependencies, and an adjusted sequencing of the Enterprise Plan.

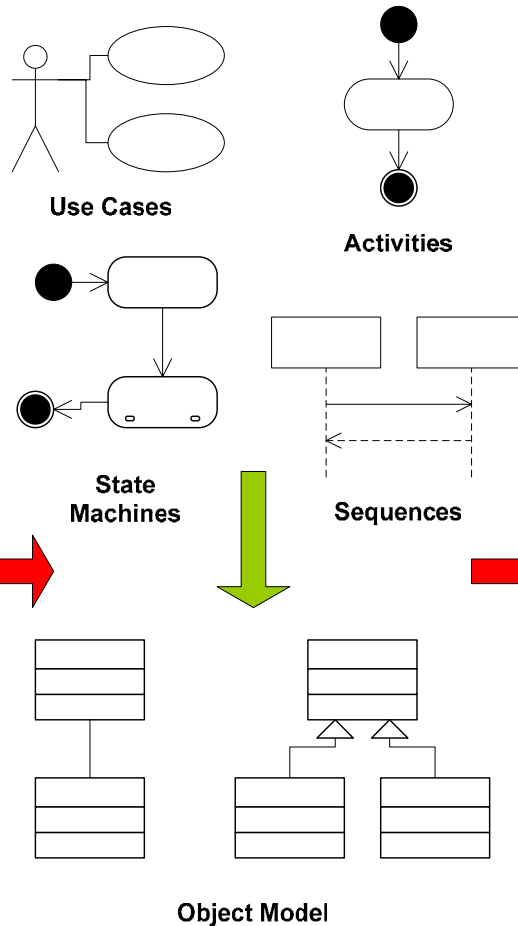
# Approach Overview



BPM allows us to document how we currently do business and discover avenues for improvement.



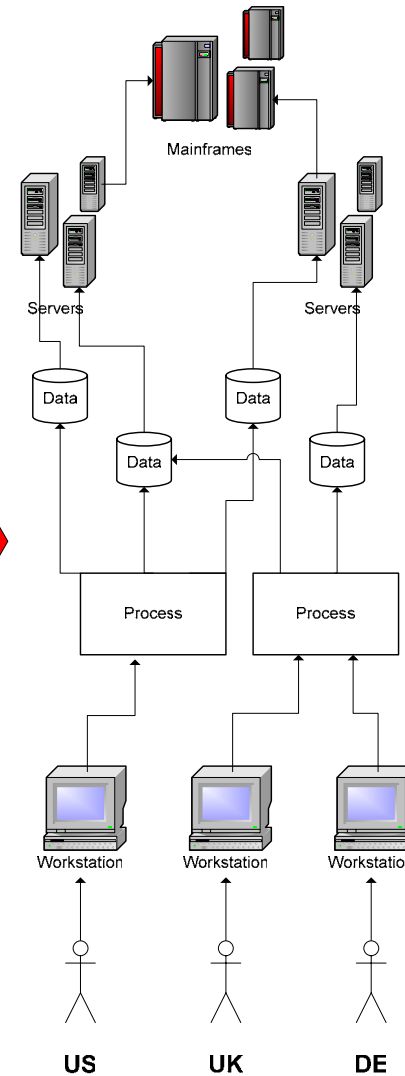
## OOA&D with UML



Rigorously exploring the behavior of the proposed system, using the Unified Modeling Language (UML) in conjunction with object-oriented techniques, results in an easily extensible object model.



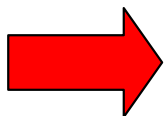
## Build



# Future State Vision – Application Framework

**The future state application framework consists of published standards as well as a useable implementation code base for each of the following areas:**

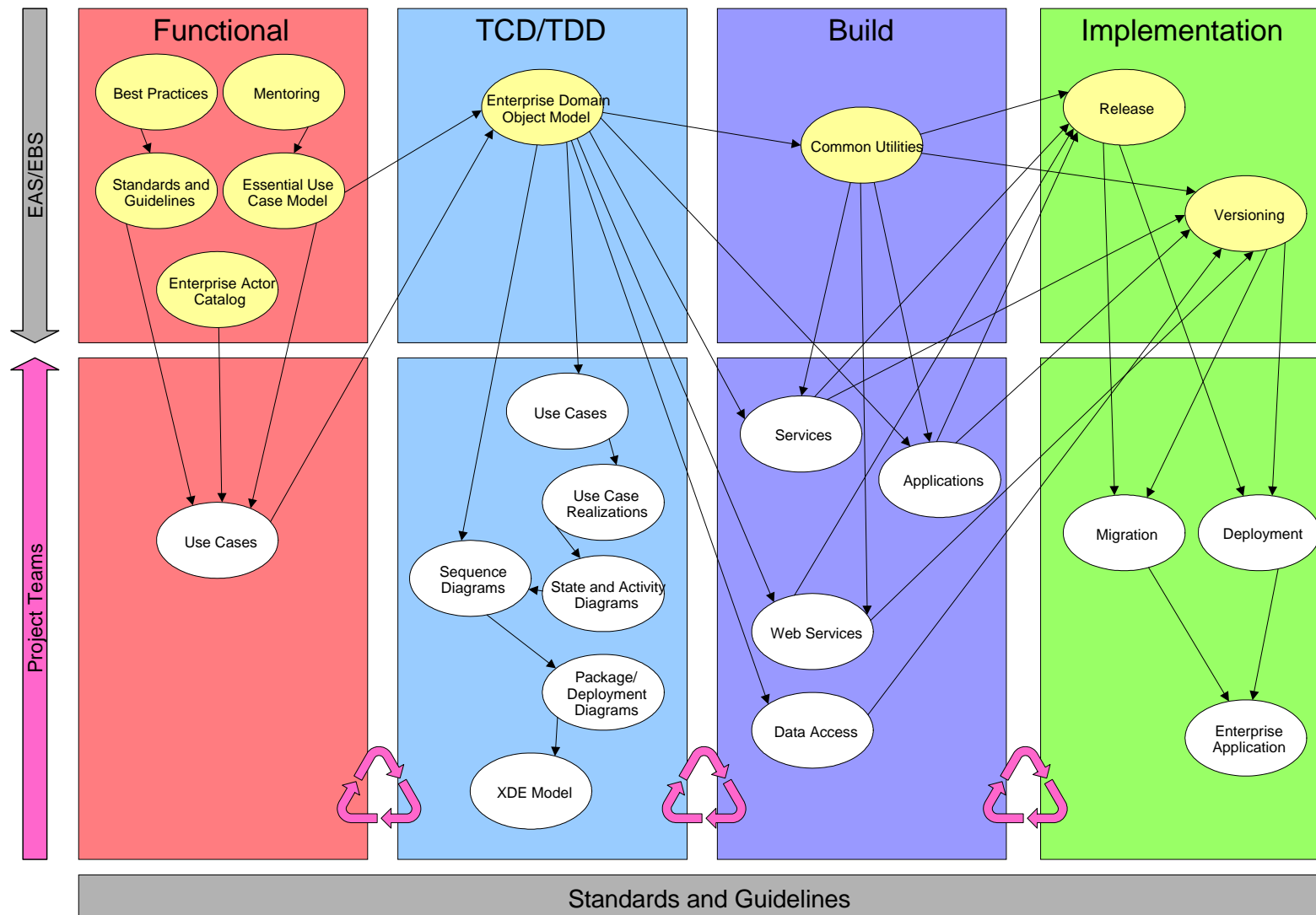
- User Interface
- Web Services
- Validation
- Transaction Management
- Object Relational Mapping (Data Access)
- Remote Invocation / Object Reuse
- Common Utilities (exception handling, security, etc)
- Application Context (configuration)



The outcome of this analysis is a common understanding of how to build applications and services as well as the base code needed to implement enterprise projects.

# Future State Vision – Process Framework

The future state process framework will grow to become an iterative process where we able to transform our application developers to application integrators.





## ***Lessons Learned***

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# What's Working?

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## Business Process Modeling

- Ability to define scope boundaries
- Use of standard flowcharts vs. UML
- Defines business in a business language clients can understand

## Application Framework

- Base classes to inherit from includes UML artifacts
- Domain Object Model
- Portal to communicate standards, guidance and best practices

## Partnership

- Training / Mentoring
- Seeding project teams

# Opportunity Areas

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## Methodology

- Bridging gap from business process models to services
- Agile, flexible process to support iterative development

## Education

- Continue developing understanding of SOA and learning curve

## Governance

- Release Management
- Configuration Management
- Change Management

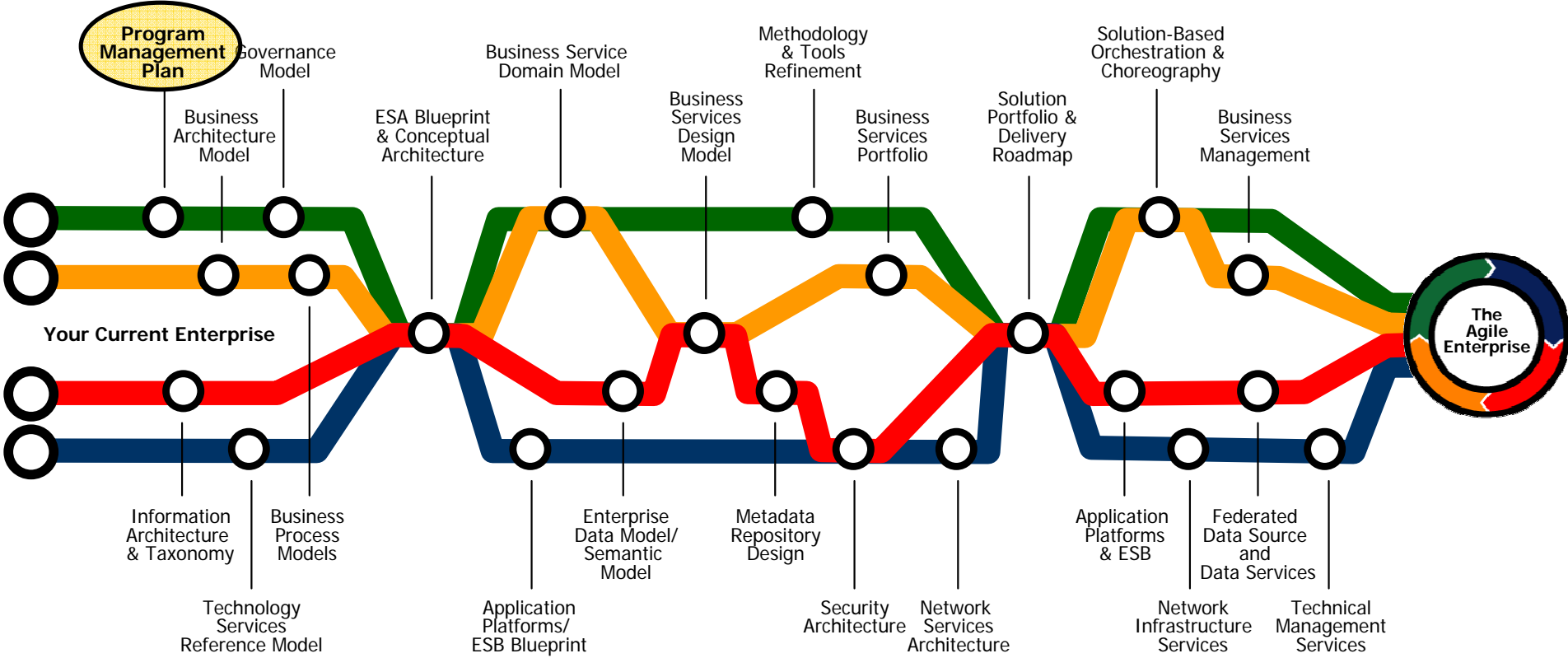
# Practical Enterprise Services Transformation

Raymond Bordogna  
Managing Director &  
Chief Strategy Officer  
LiquidHub



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# Enterprise Services Transformation Roadmap

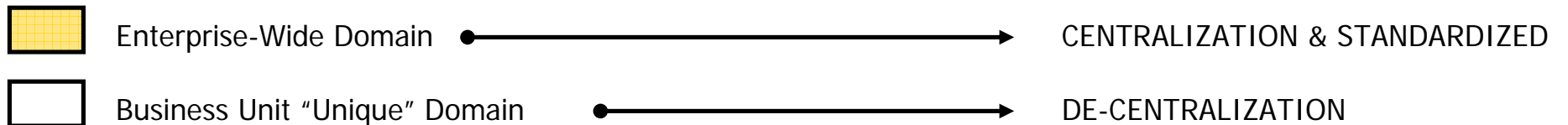
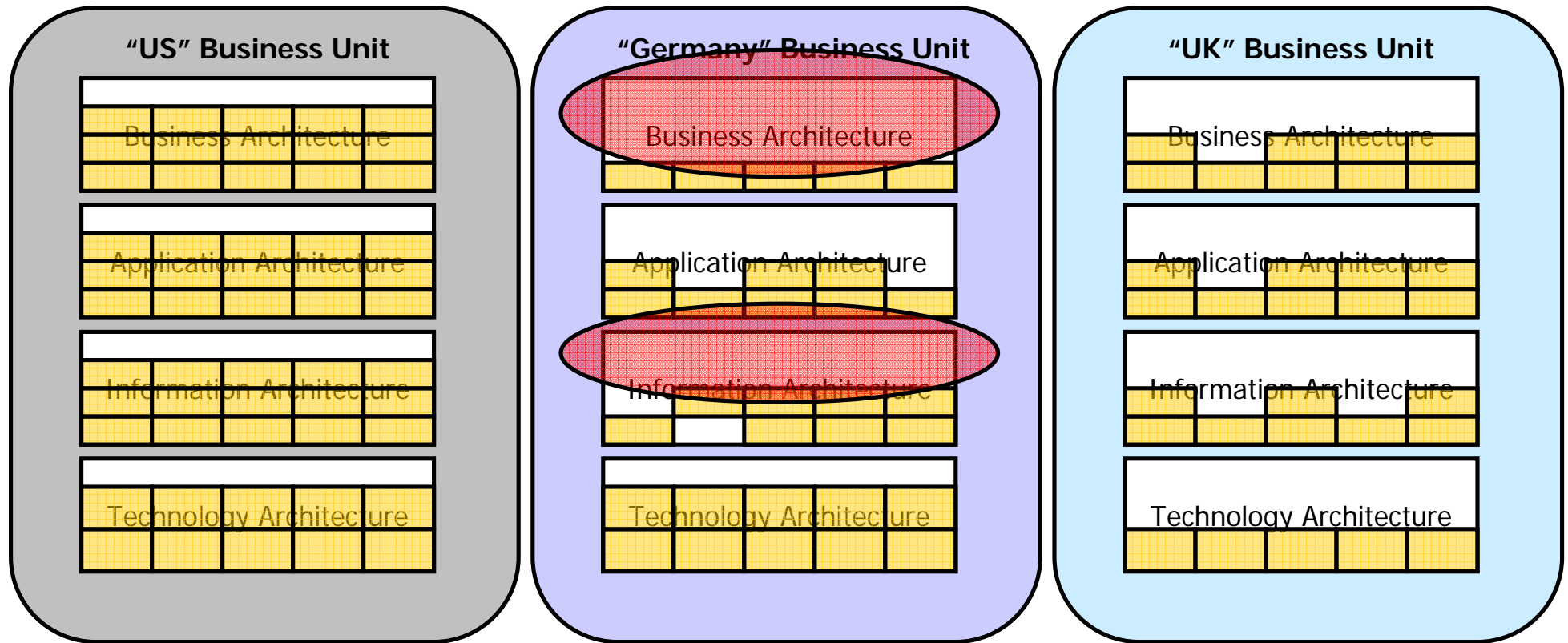


- Program Management
- Enterprise Business Services
- Information Management
- Technology Shared Services

# ESTR Decision Point: *Define the scope of "Enterprise"*

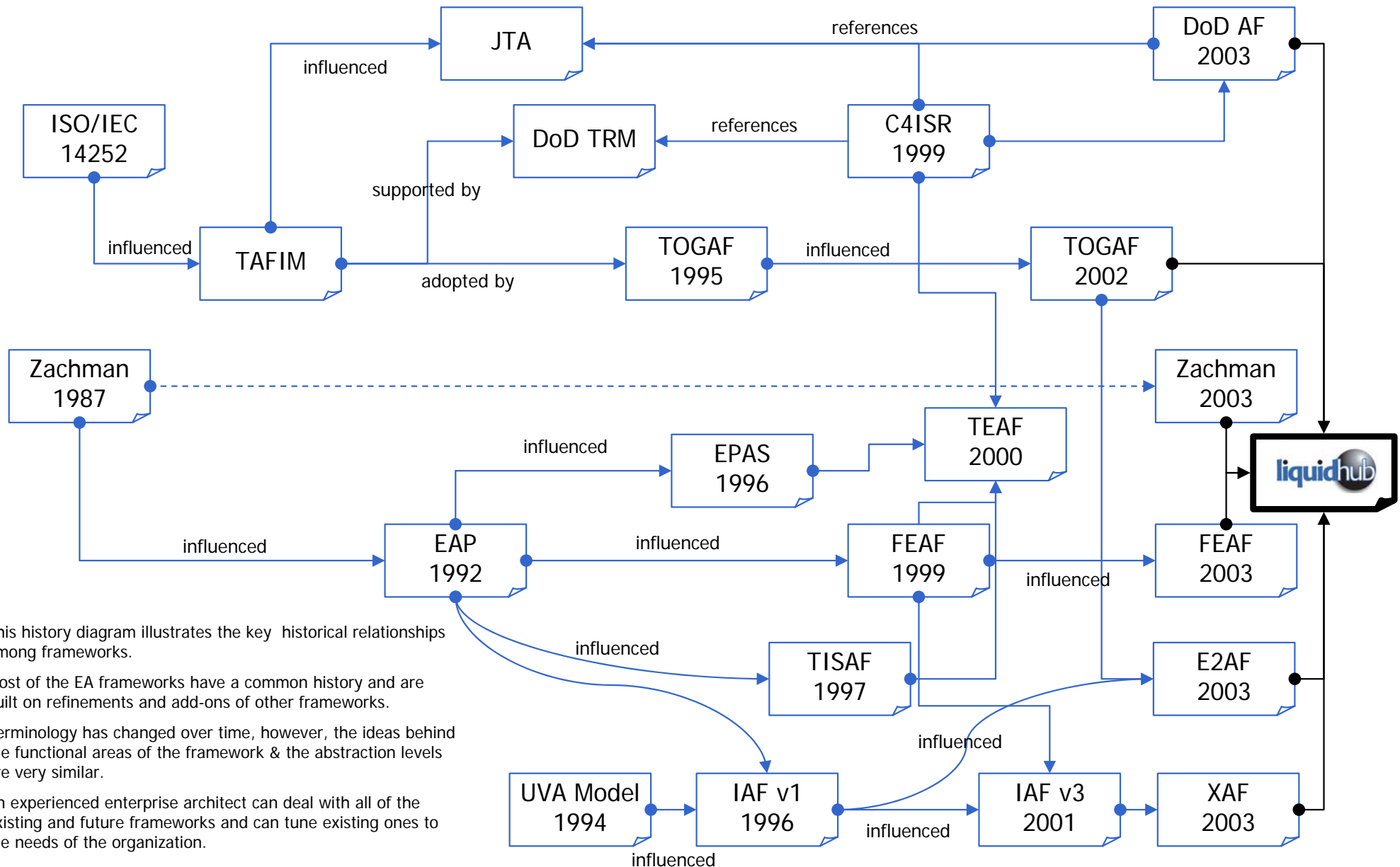
## Enterprise Scope Trade-off:

Economies of scale in leveraging enterprise-wide services vs. coordination costs between standardizing across business units.



# ESTR Decision Point:

## Determine a framework that supports your strategy



This history diagram illustrates the key historical relationships among frameworks.

Most of the EA frameworks have a common history and are built on refinements and add-ons of other frameworks.

Terminology has changed over time, however, the ideas behind the functional areas of the framework & the abstraction levels are very similar.

An experienced enterprise architect can deal with all of the existing and future frameworks and can tune existing ones to the needs of the organization.

1985

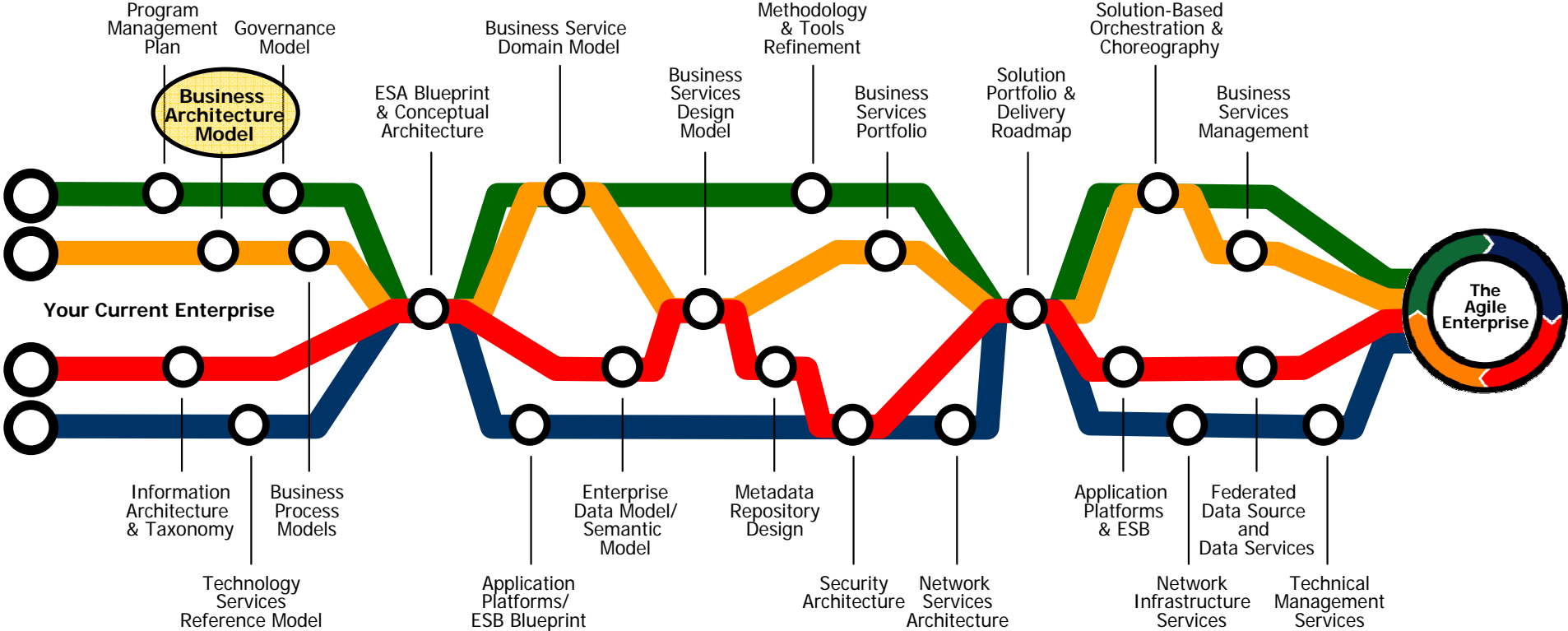
1990

1995

2000

2005

# Enterprise Services Transformation Roadmap



- Program Management
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- Information Management
- Technology Shared Services

# ESTR Business Architecture Model: Financial Services/Investment Management

**Partner & Supplier Interaction**

- Brokers
- Trust Accounting
- External Advisors
- Transaction Clearing-houses

**Fund Accounting**

- Cash Management
  - Manage Cash
- Pricing
  - Price/Value Investments
  - Correct Pricing Error
- Securities Accounting
  - Conduct Securities Lending
  - Perform Clearing & Settlement

**Analysis & Product Development**

- Performance Analysis
  - Product/Service Success Analytics
- Service Development
  - R&D
  - Product Lifecycle

**Record Keeping**

- Process Information Requests
  - Generate Reports
  - Generate Statements
  - Generate Confirm/Notifications
- Process Client Transactions
  - Manage Assets
  - Manage Account Balance
  - Administer Installment Payment
  - Rebalance Assets
  - Calculate Benefits
  - Convert New Plan
  - Bill Fees
  - Process Credit/Margin
  - Calculate Annuity Payments
  - Administer Annuitization Payment
  - Manage Loans
  - Manage Trust Assets
  - Manage Trust Income & Disbursements
  - Process Corporate Actions
  - Withhold Taxes
  - Purge/Archive Records
  - Manage Client Payments
  - Prepare Excess Refund
  - Prepare Pass-Through Dividend
  - Manage Brokerage Orders

**Advisory Services**

Financial Planning

- Create Financial Plan
- Manage Financial Plan

**Account Management**

- Manage Accounts
  - Setup/Maintain Person
  - Setup/Maintain Account
  - Setup/Maintain DC/DB Plan
  - Setup/Maintain Trust
- Prepare Client Transactions
  - Prepare Purchase
  - Prepare Redemption
  - Prepare Exchange
  - Prepare Buy
  - Prepare Sell
  - Exercise Options
  - Prepare Contribution
  - Prepare Withdrawal
  - Prepare Rollover
  - Perform Adjustments
  - Administer Installment Setup
  - Administer Annuitization Setup
  - Administer Loan
  - Prepare Asset/ Account Transfer
  - Prepare Plan Level Transfer
  - Prepare 1035 Exchange
  - Terminate Person
  - Prepare Death Claim
- Manage Information Requests
  - Provide Information
  - Provide Personalized Performance Data

**Investment Management**

Investment Strategies Management

- Manage Portfolios
- Replicate Indexes
- Manage Order Routing and Execution
- Monitor Performance

**Management & Operations**

<p><b>Account Reconciliation</b></p> <ul style="list-style-type: none"> <li>Reconcile Checks</li> <li>Reconcile Client Accounts</li> <li>Reconcile Transfer Agency Accounts</li> <li>Reconcile Custody Bank Accounts</li> <li>Reconcile Omnibus Accounts</li> </ul>	<p><b>Compliance</b></p> <ul style="list-style-type: none"> <li>Monitor Investment Compliance</li> <li>Monitor Client Compliance</li> <li>Audit Dividend &amp; Capital Gain Disbursements</li> </ul>	<p><b>Client Control Reporting</b></p> <ul style="list-style-type: none"> <li>Process As-of Transactions</li> <li>Provide Tax Services</li> </ul>	<p><b>Money Movement</b></p> <ul style="list-style-type: none"> <li>Move Money</li> </ul>	<p><b>Inventory Management</b></p> <ul style="list-style-type: none"> <li>Manage Literature Inventory</li> <li>Fulfill Literature Requests</li> </ul>	<p><b>Financial Management</b></p> <ul style="list-style-type: none"> <li>Perform Corporate Budgeting</li> <li>Provide Executive Information</li> <li>Execute Monthly/Yearly Financials</li> <li>Perform AP/AR</li> <li>Issue Payroll</li> <li>Track Assets</li> <li>Prepare Compliance Reporting</li> </ul>	<p><b>Human Resources</b></p> <ul style="list-style-type: none"> <li>Hire/Retain/Release Employees</li> <li>Provide Career Management</li> <li>Provide Work/Life Initiatives</li> <li>Prepare Compliance Reporting</li> </ul>
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**Customer Relationship Management**

Marketing

- Analyze/Understand Client
- Perform Market Research/Analysis
- Create/Modify Products/Services
- Educate Client
- Prepare Communications

Customer Service

- Call Center Services
- Customer Lifecycle
- Customer Segment Management

Sales Force Automation

- Campaign Management
- Contact Management
- Sales Goal Performance Management/Dashboard

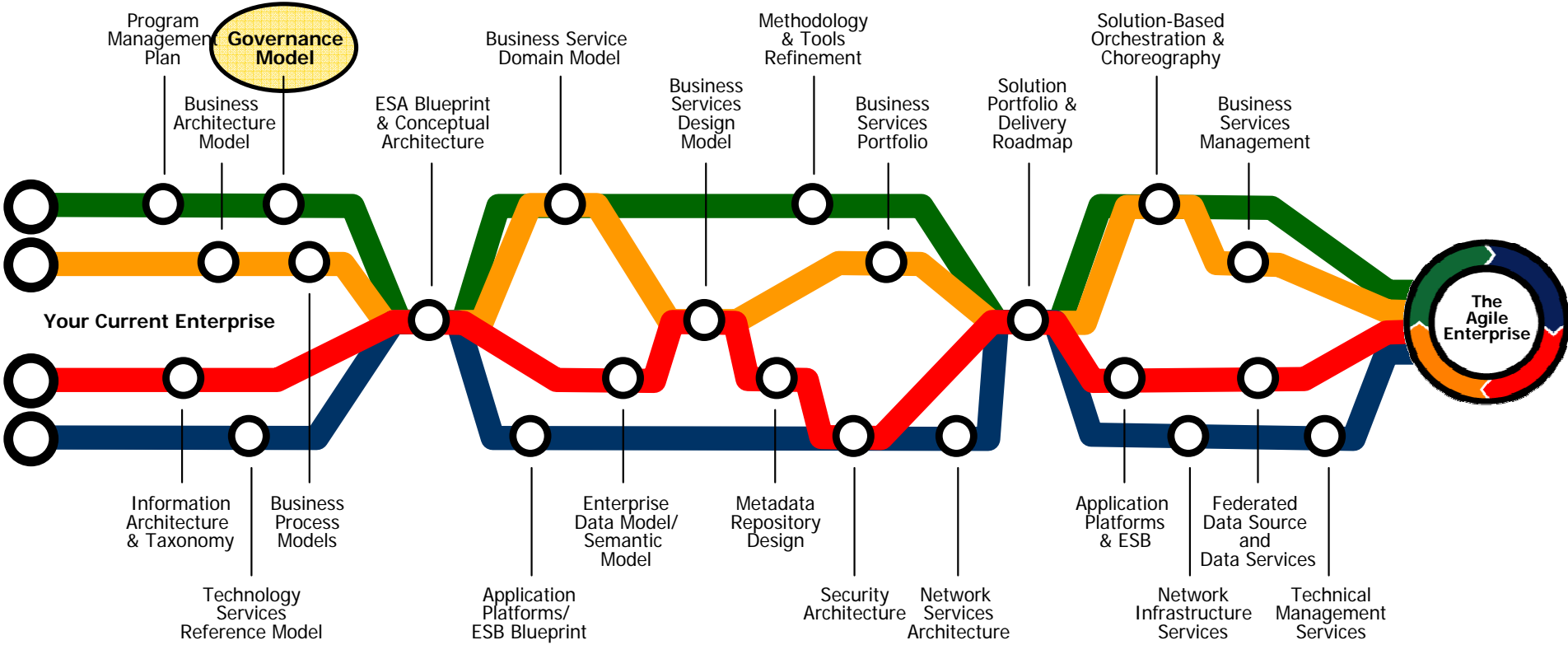
**Channels**

- Kiosk/POS
- Call Center/IVR
- Web
- Client
- Mobile
- Fax
- Paper

**Customer Segments**

- Retirement Client
- Brokerage Client
- Endowment Client
- Trust Client
- Defined Contribution Client
- Defined Benefit Client

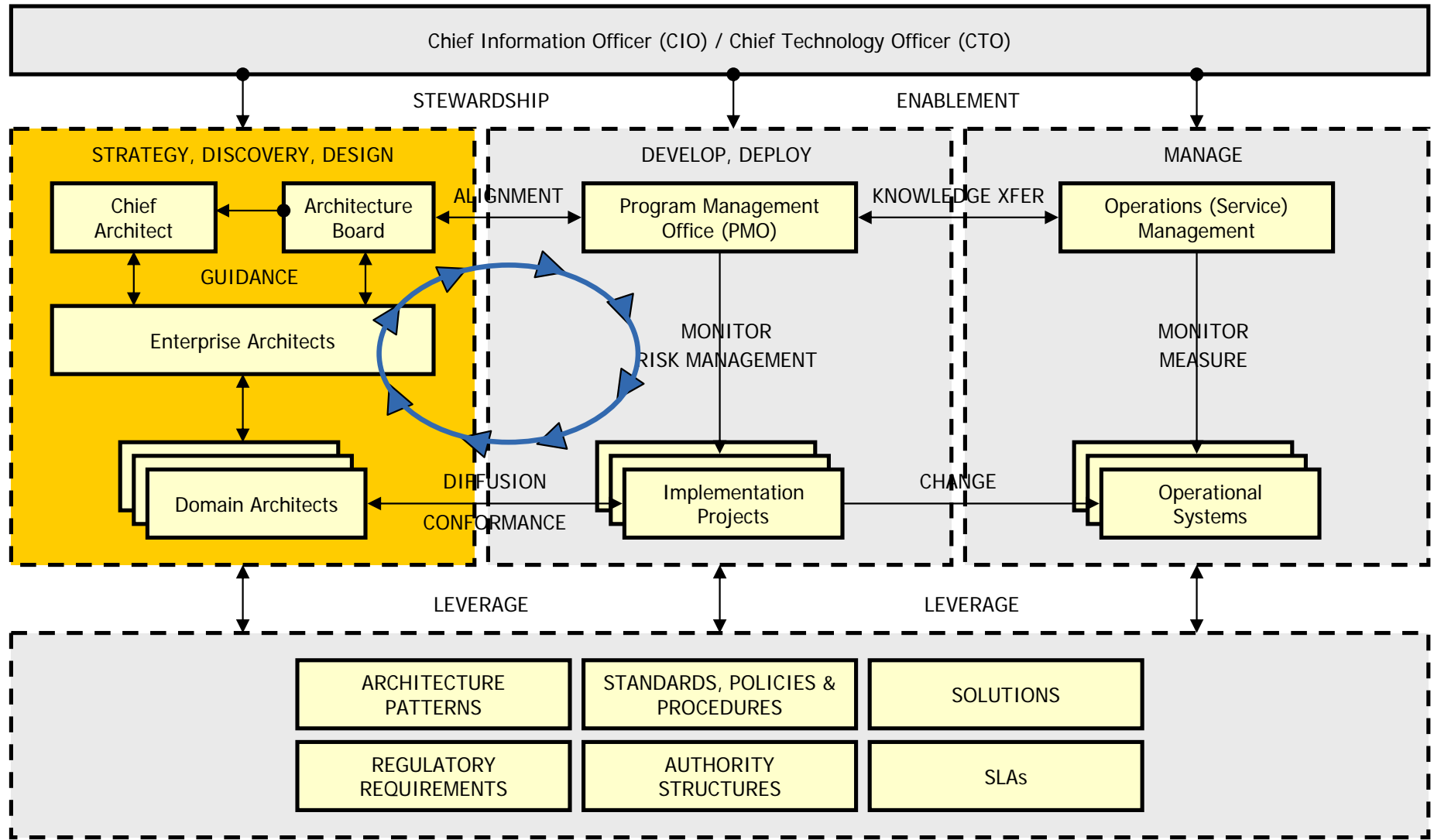
# Enterprise Services Transformation Roadmap



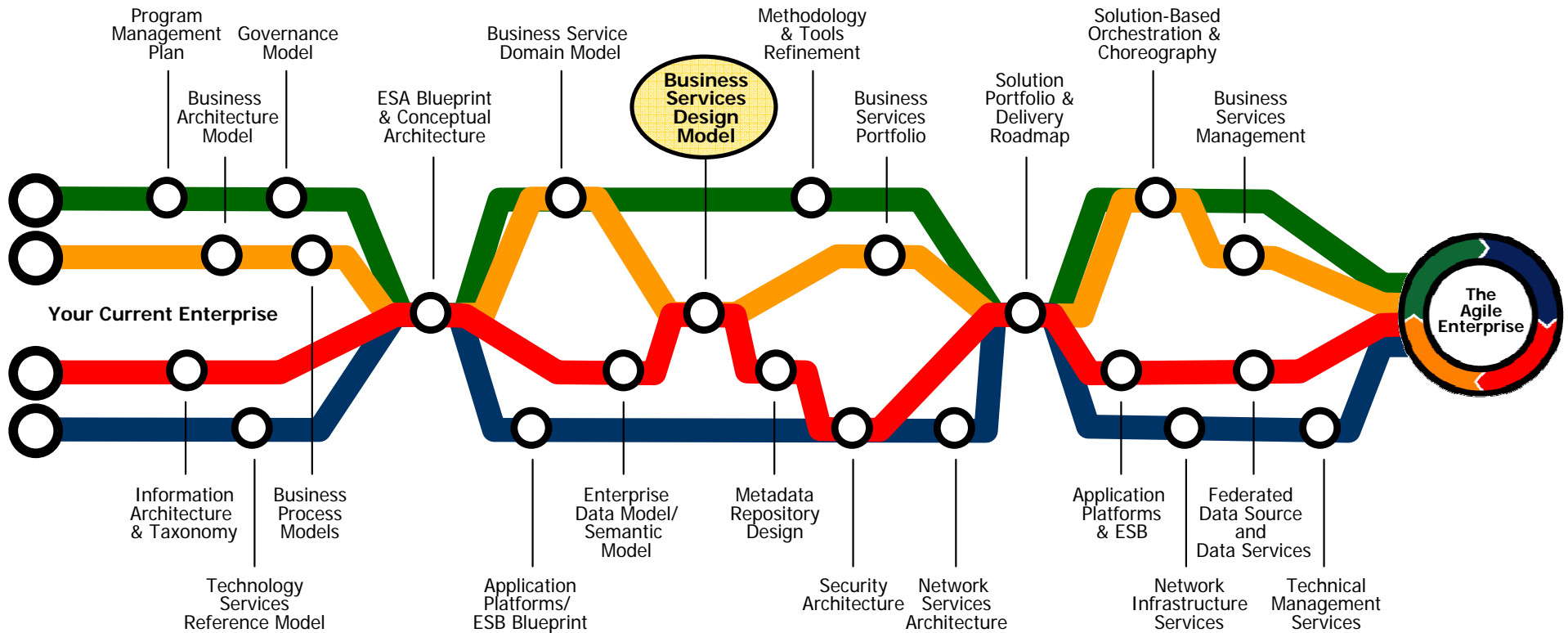
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# ESTR Deliverable:

## High-Level IT Governance Model (Organizational View)



# Enterprise Services Transformation Roadmap



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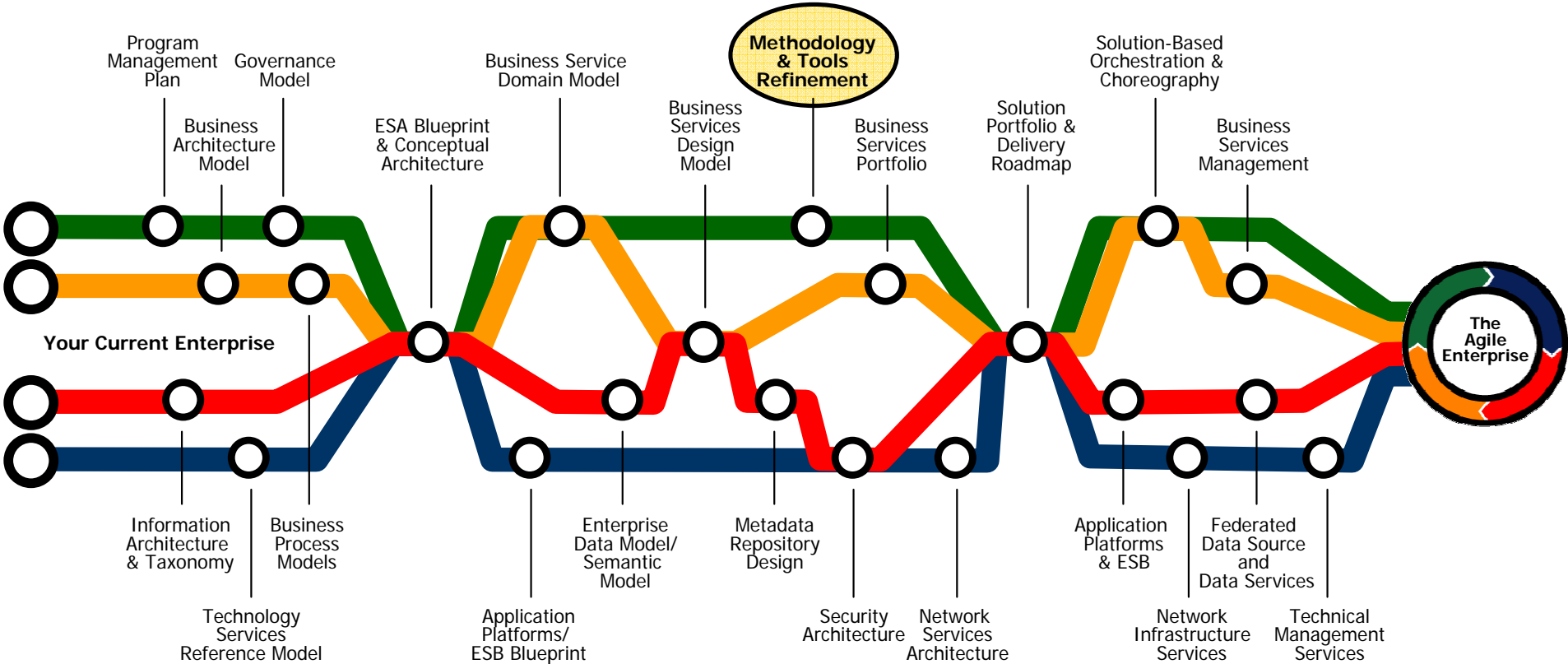
# ESTR Guidelines:

## Tips for Smarter Service Design

**The coarse- and fine-grained trade-off is a matter of latency and usability.** At the end of the day, you should move to a good SOA, exposing the right services that do the right things, and not be as concerned about granularity. Services that implement fine-grained interfaces and that are meant for local invocation will work well. Moreover, services that implement fine-grained interfaces, that are meant for distributed invocation, and that are on a low-latency network will also work well.

No.	Tip	Description
01	<b>Design services to be shared</b>	The value of a service is magnified by the value of the relationships enabled. Being shared does not mean the code is shared; the service is shared. One of the important advantages of a services-based model is that the provider of a service is not concerned with the consumer's platform and the consumer does not have to install and maintain software. Services enable the acquisition of new functionality without having to deploy and maintain new applications.
02	<b>Services have a clear purpose</b>	The business value of services to consumers of those services must be clear and unambiguous. To maximize the value of services, it is necessary to understand the core competencies your organization provides to others. When this business value can be articulated clearly, it defines the requirements for services that are useful to others in your value chain.
03	<b>Services are discoverable and support introspection</b>	To share services, the producer of a service must be able to publish it in a form the consumer of the service can find and bind to dynamically. The consumer must be able to discern how to use the service without having to talk person to person to the producer of the service. The conversation on how to use the service is ideally machine to machine.
04	<b>Services are designed to be loosely coupled</b>	Services are intended live in a loosely coupled environment and should use other services to perform common clearly defined tasks (for example, authentication or reporting). The value of services is magnified by their reuse and further magnified by their ability to be combined with other services to create new services. As services are typically owned by multiple entities, they need to be loosely coupled to allow each one to change and evolve independently of the others.
05	<b>Services plug into a framework</b>	Once a service has been discovered, it needs a framework that provides other common services and loose coupling. While services may be created without an SOA, they need an SOA to operate in. SOAs by their nature are federated, as they need to interact in a loosely coupled manner.
06	<b>A service has a well-defined use policy/contract</b>	It is important to realize that in a services model both the consumer and the producer of a service need the ability to set use policies. The consumer and producer of a service define policies around security, availability, reliability, and error and exception handling.

# Enterprise Services Transformation Roadmap



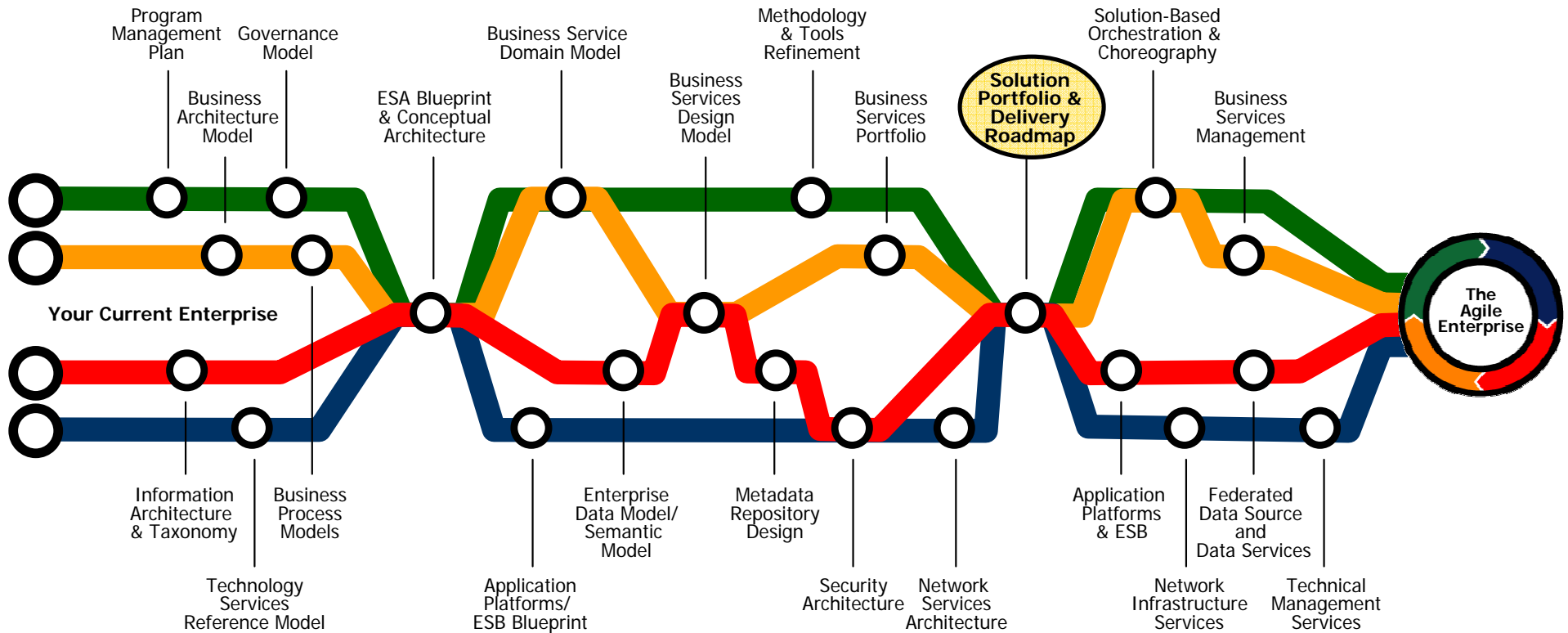
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# ESTR Decision-Point:

*Determine which BPM technique(s) suits your needs*

Potential Business Process Modeling Technique	Description	Considerations
<b>Unified Modeling Language [UML] 2.0 Activity Diagram</b>	An industry-standard diagram that shows activities/processes and the control flow between them [OMG, 2004]	Can be used to model high-level business processes of the complex logic within a system. Although this is an industry standard, <b>the current tool support for this diagram is questionable at best</b> . Moreover, the standard notation is limited vis-à-vis some of the other richer notation sets.
<b>Use Case Model</b>	A use case model comprises zero or more use case diagrams (which depict actors and use cases). Use Cases are one of the standard UML 2.0 diagrams [Jacobson, Christerson, Jonsson, and Overgaard 1992]	Very good at exploring how people interact with your organization but <b>not very good at depicting true process flows</b>
<b>Business Process Modeling Notation [BPMN]</b>	The BPMN specification defines a potentially standard graphical notation for expressing business processes. In addition to basic process flow, it is possible to depict swimlanes (which indicate who/what performs the activities), data flows and message sends.	An emerging standard from BPMI. The objective of BPMN is to define a notation that is intuitive to business users yet still sophisticated enough to represent complex process semantics for developers. <b>New notation that has little tool support.</b>
<b>Value Stream Map</b>	A value stream map lists the steps/activities of a business process across the top as a collection of serial boxes. Below the boxes is a simple timing diagram depicting 2 actions: the work time it takes to accomplish a process step and the wait time within and between steps [Poppendieck 2003]	Use the analyze the effectiveness of a business process, identifying potential loss of value (wait time). <b>This technique is not well known in the IT community.</b>
<b>Data Flow Diagram [DFD]</b>	A diagram that shows the movement of data between processes, entities and data stores [Gane & Sarson, 1979]	Useful for logical & physical modeling. DFDs are the mainstay of traditional project-level process modeling and are often used for enterprise modeling activities. DFDs are typically supported by traditional modeling tools, although because this <b>technique fell out of favor in the early 1990s, many IT professionals are not familiar with it.</b>
<b>Integrated Computer-Aided Manufacturing Definition [IDEFO] Diagram</b>	IDEFO is a business process model that shows the processes and the flows between processes. There are syntactic rules – inputs enter the left side, outputs leave the right side, controls enter the top.	Detailed logical process and/or workflow modeling. Supported by high-end business process modeling tools, although this <b>notation gained little acceptance outside the American military establishment.</b>

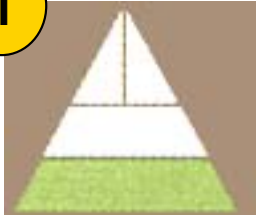
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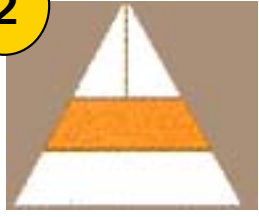
# ESTR Decision Point: *Determine your portfolio pyramid*

1



**Infrastructure**  
These investments provide a shared and standardized base of capability for the enterprise and lead to greater business flexibility and integration. Infrastructure investments are **moderately risky because of their technologies' long life-spans and technical uncertainty.**

2



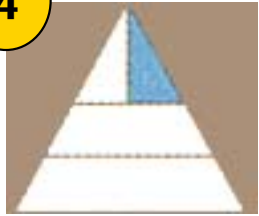
**Transactional**  
These IT initiatives process and automate the basic transactions of a company. They are intended to reduce costs and boost productivity and boast an average internal rate of return of 25 percent to 40 percent. **These investments have the least risk of the four classes.**

3



**Informational**  
These systems provide information for managing a company. Their payoff comes from shorter time-to-market, superior quality and the ability to set premium prices. They are **moderately risky because companies often have difficulty acting on information to generate business value.**

4



**Strategic**  
These investments, almost always external-facing systems, pay off in sales growth, competitive advantage and stronger market positioning. **But they are the riskiest of the investment classes:** 10 percent will produce spectacular results, but 50 percent will fail to break even.

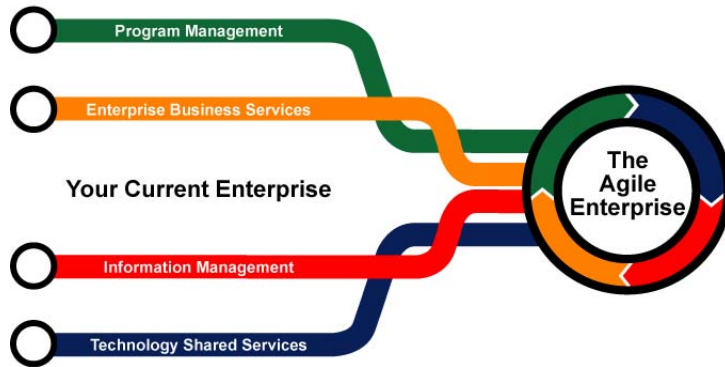


Adapted from MIT Sloan Research, 2005



## Key Takeaways

- Services implementation doesn't start with technology—start with your business goals
- Think globally (adopt an Enterprise Architecture mindset), act locally (build services that matter to the business)
- Implement incrementally
- Attend to the governance, management and education issues
- And, of course, select the right partner to help



# The Enterprise Services Transformation Roadmap<sup>SM</sup>

## Building a Real World Services Architecture



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## LiquidHub & QVC

July 13, 2005