IBM ISV and Developer Relations

Discovering the Value of SOA
Using IBM WebSphere Service Bus Technology

Mexico City, 11-Nov-2009

Briefing Agenda

- Introduce the concepts of a Service Oriented Architecture (SOA)

- Introduce the Enterprise Service Bus architectural pattern

- Evaluate the appropriate application of several ESB implementations

- Review a methodology for designing an SOA using an ESB

- Introduce the concepts of SOA governance and the role of a service registry and repository

The divide between business and IT:

Differing priorities and expertise for End-to-End Process Automation

Business Domain

Business people have the business process expertise

Business Needs Responsiveness and Control

- Rapid innovation without replacing applications
- Control of the business model and business processes
- Integration of horizontal processes
- Visibility into technology-enabled business activities

IT Domain

IT people know how to implement and run applications

IT Needs Stability and Control

- Efficiently manage hundreds of applications
- Consolidate and simplify infrastructure to reduce costs
- Improve service levels of existing applications
- Stability simplifies efficient operations

Flexible Business requires Flexible IT
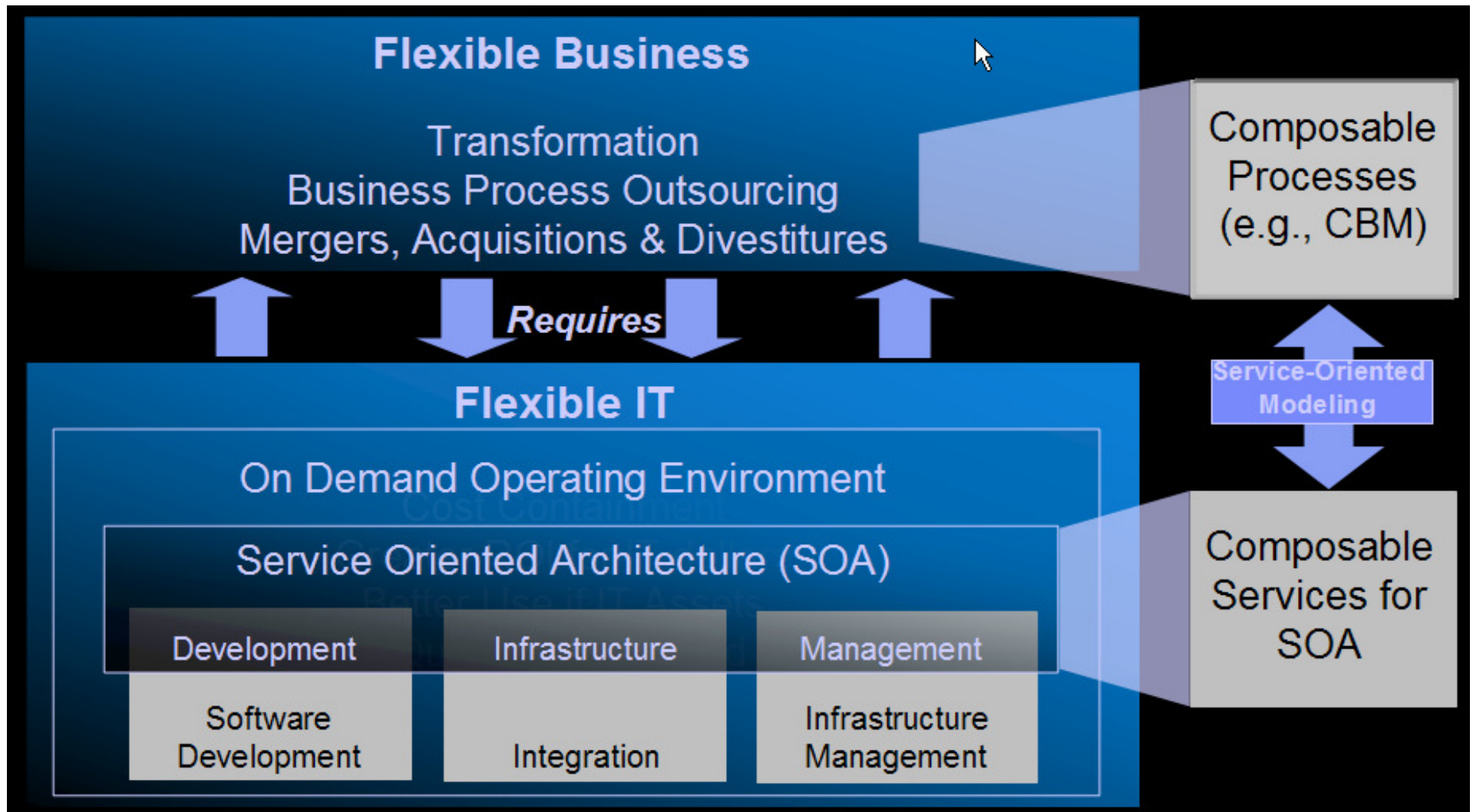
What is …..?

… a service?

A **repeatable business task** – e.g., check customer credit; open new account

… service orientation?

A way of integrating your **business as linked services** and the outcomes that they bring

… service oriented architecture (SOA)?

An IT **architectural style** that supports service orientation

… a composite application?

A set of **related & integrated** services that support a business process built on an SOA

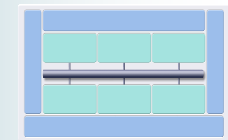# Service Oriented Architecture

Different Things to Different People

Roles

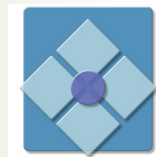|	
Capabilities that a business wants to expose as a *set of services* to clients and partner organizations	**Business**
An *architectural style* which requires a service provider, requestor and a service description. It addresses characteristics such as loose coupling, reuse and simple and composite implementations	**Architecture**
A *programming model* complete with standards, tools, methods and technologies such as Web services	**Implementation**
A *set of agreements* among service requestors and service providers that specify the quality of service and identify key business and IT metrics	**Operations**

SOA – The next stage of integration

Messaging Backbone
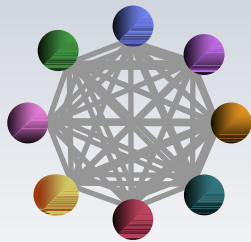
- Point-to-Point connection between applications
- Simple, basic connectivity

Enterprise Application Integration (EAI)
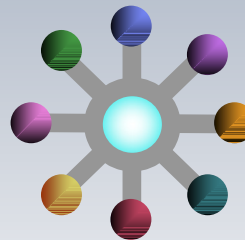
- EAI connects applications via a centralized hub
- Easier to manage larger number of connections

Service Orientated Integration
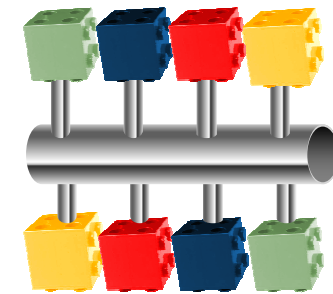
- Integration and choreography of services through an Enterprise Service Bus
- Flexible connections with well defined, standards-based interfaces

Flexibility

The promised benefits of SOA

Business process agility

New value through reuse of assets

Improved connectivity

Closer alignment of IT to business

Business Flexibility

The Vertical Silo Problem

Cashier

Accountant

Comptroller

Analyst

- Application functionality is tightly bound to a static notion of a process

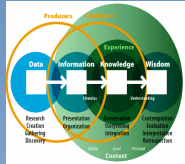- Little flexibility to take into account new roles or processes

Point of Sale

Sales Tax Calculation

Accounting

Sales Tax Calculation

Financial Reporting

Sales Tax Calculation

Applications

Infrastructure

- Management is focused on the health of the server, network and middleware

- Applications are "black boxes".

- This creates redundant code and functions.

- Inflexible, expensive and hard to maintain.

The New World: Composable Services

Cashier   **Accountant**   **Comptroller**   **Analyst**

Point of Sale Ⓧ

Sales Tax Calculation

Accounting Ⓧ

Sales Tax Calculation

Financial Reporting Ⓧ

Sales Tax Calculation

This forces us to re-examine what we call "applications" and what we call "infrastructure"!

Sales Tax Calculation Ⓧ

Applications

- -

Infrastructure

Externalizing common functions as "services", in a standards-based fashion, allows for code re-use, saving on development and maintenance. ✅

However, this creates an important dependency; if the 'service' is not working, the applications cannot function Ⓧ

The New World: Composable Services + ESB

Cashier   Accountant   Comptroller   Analyst

Point of Sale

Sales Tax Calculation

Accounting

Sales Tax Calculation

Financial Reporting

Sales Tax Calculation

Applications

Services

ESB

Sales Tax Calculation

Infrastructure

Hosting the service on an ESB destination, we have policy enforcement, mediations and a centralized management point.

This ESB destination can be monitored by IBM Tivoli® products….applications are no longer black boxes.

Choreograph components into business processes
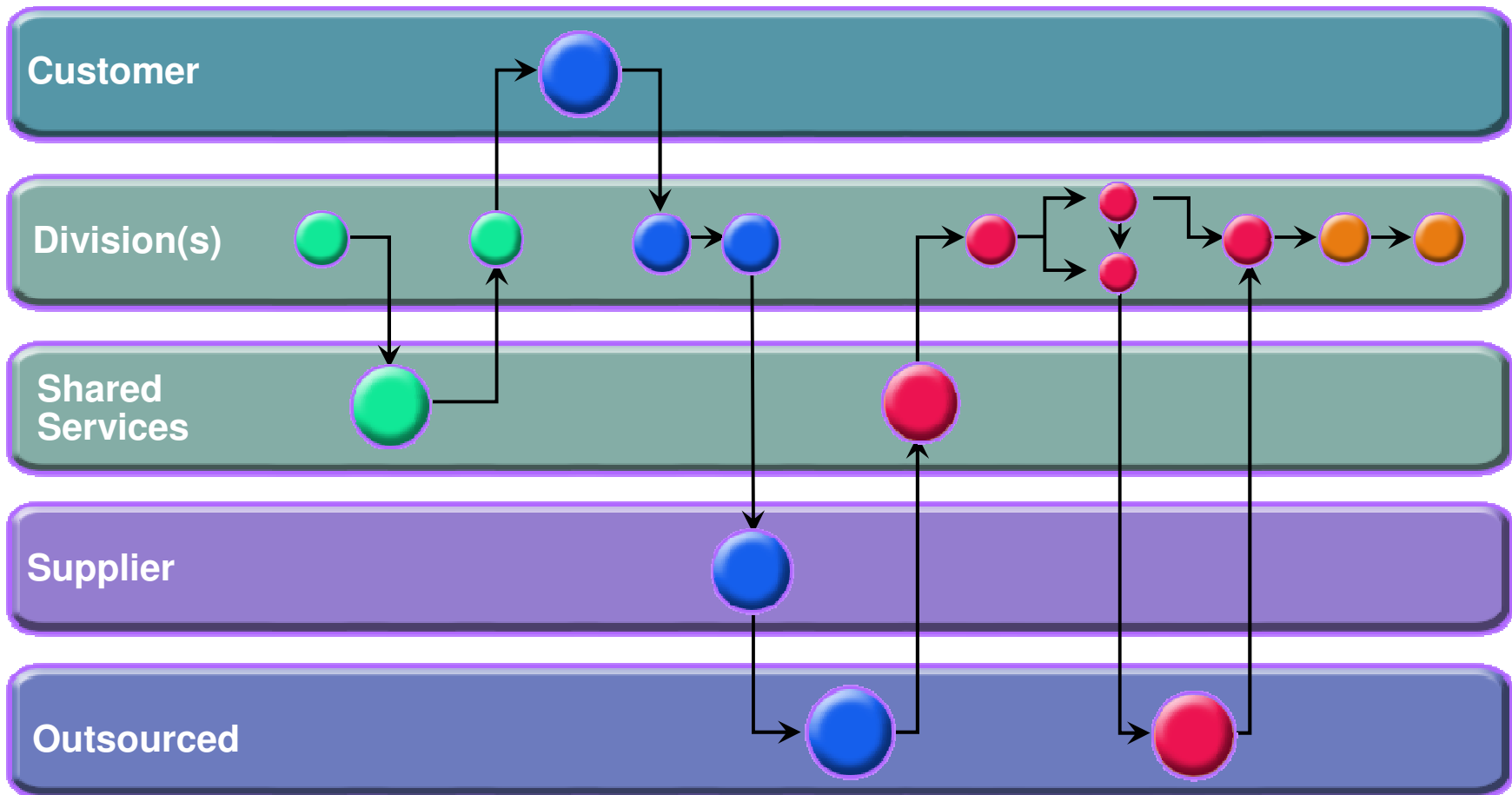
Add a Flexible Integration Layer - ESB

Customer

Division(s)

Enterprise Service Bus

Shared Services

Supplier

Outsourced
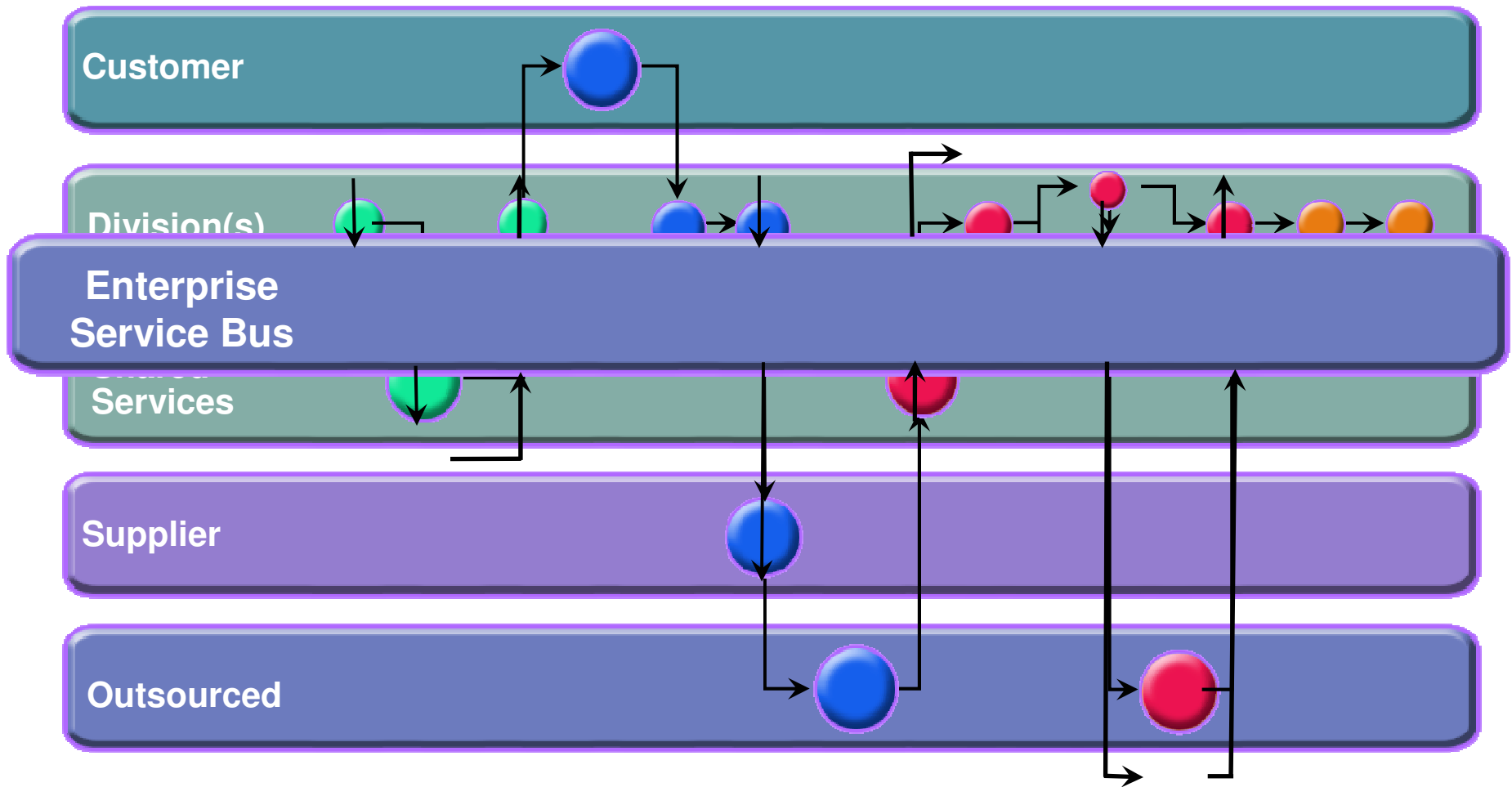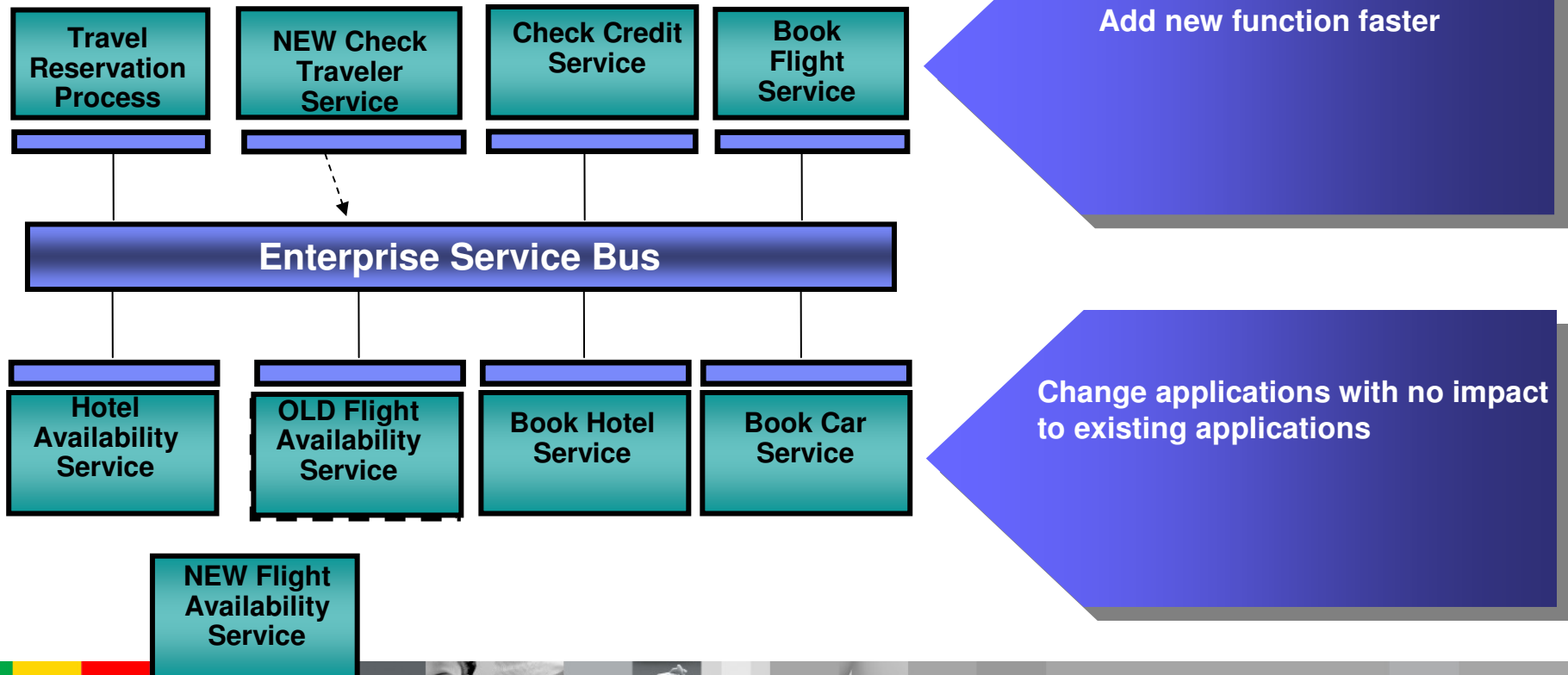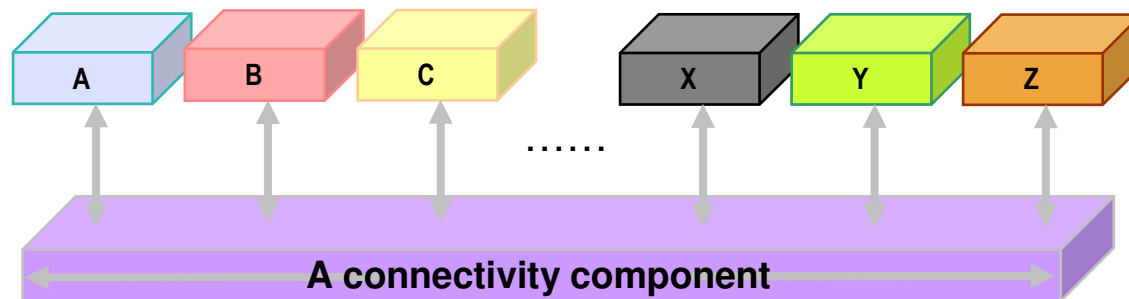
Value of an ESB

1. Improve business flexibility
2. Eliminate point-to-point application connectivity
3. Change your I.T. with minimal disruption
4. Reuse services for multiple purposes

Travel Reservation Process	NEW Check Traveler Service	Check Credit Service	Book Flight Service

Add new function faster

Enterprise Service Bus

Hotel Availability Service	OLD Flight Availability Service	Book Hotel Service	Book Car Service

Change applications with no impact to existing applications

NEW Flight Availability Service

What Problem Do We Need To Solve?

Connecting services, moving information around…

……

A connectivity component

Why is this a Challenge?

- **How do you…?**

  ▸ *Move data across different systems, platforms, and devices when the HW, SW configurations and programming models are different?*

  ▸ Overcome network failures?

  ▸ *Deliver information when the target application is not online or is busy?*

  ▸ Ensure transmission integrity and recovery?

  ▸ *Handle lost or/duplicate data?*

  ▸ Ensure a secure connection?

  ▸ *Ensure multi-step transactions either happen completely or not at all?*

  ▸ Apply qualities of service based on different requirements? e.g., assured delivery, fast delivery?

  ▸ *Manage a session (request/response)?*

  ▸ Efficiently distribute events?

  ▸ *Scale to handle volumes?*

  ▸ Deal with data in unlike formats?

  ▸ *Determine which data to send where?*

  ▸ Audit who send what, where and when?

You either:

1. Program it all into your applications

2. Build your own middleware
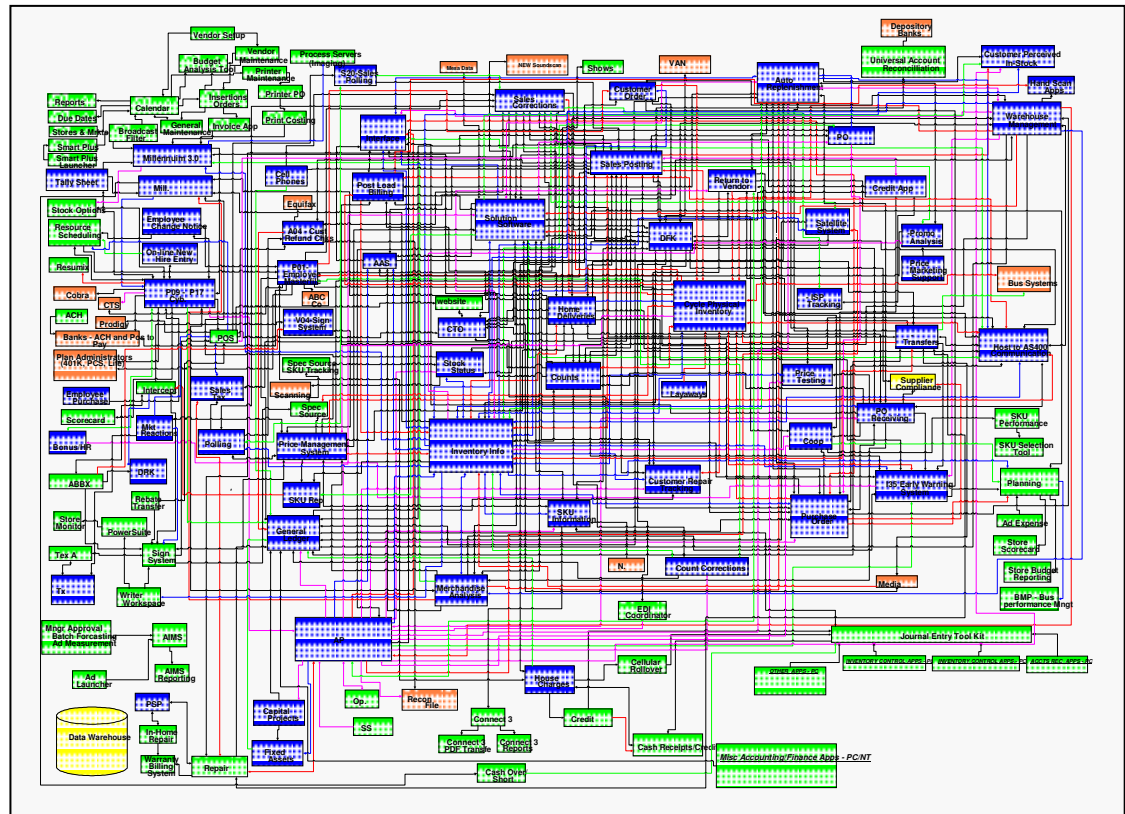
3. Buy middleware to do it for you

What Other Problems Do We Have?

Ever increasing application maintenance costs.

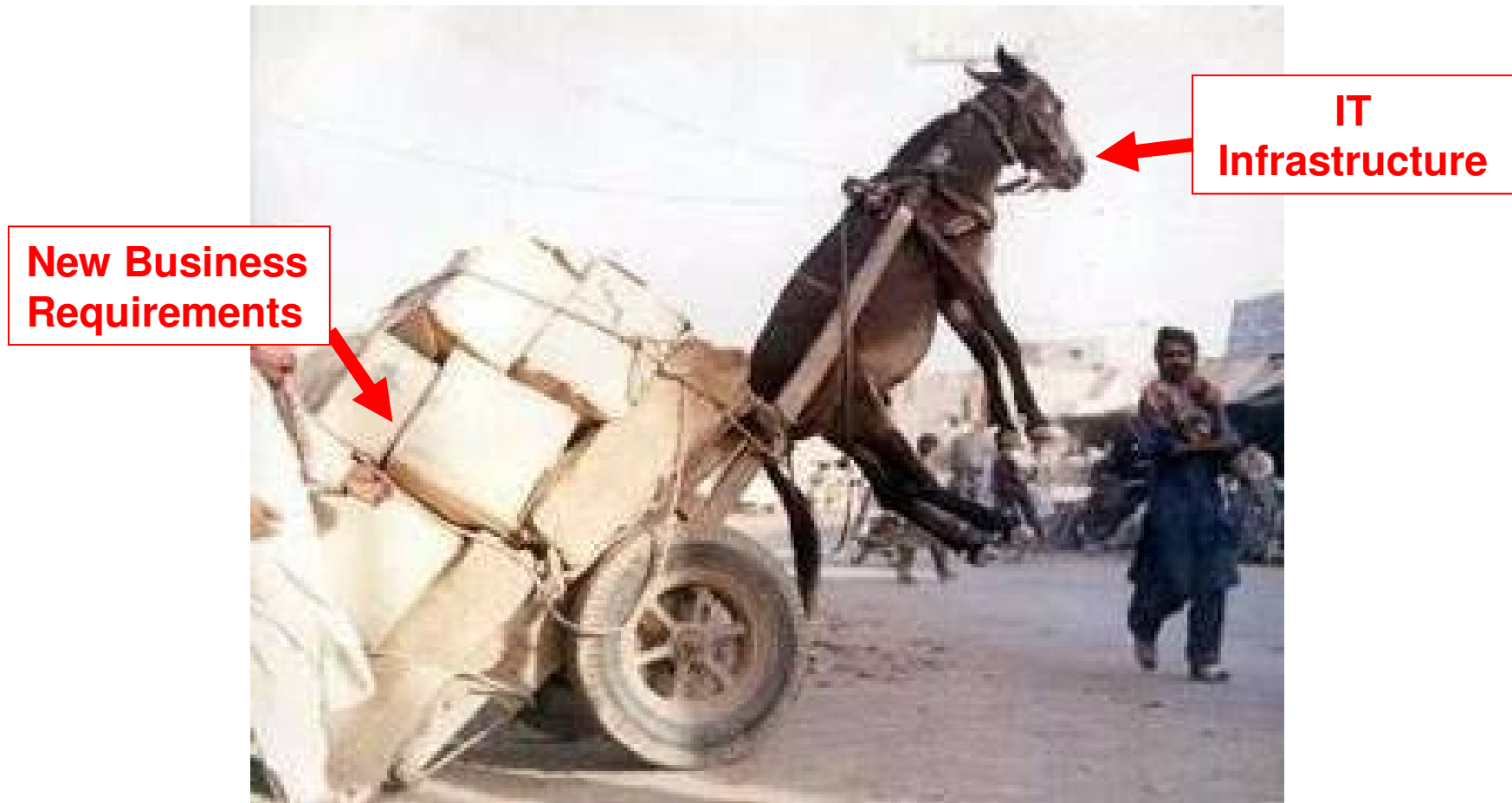*"In 2004, **73% of I.T. budgets were spent on maintenance** and 27% on new investments.*

*In 2005, survey respondents expect to spend **76% on maintenance**, leaving just 24% for new investments."*
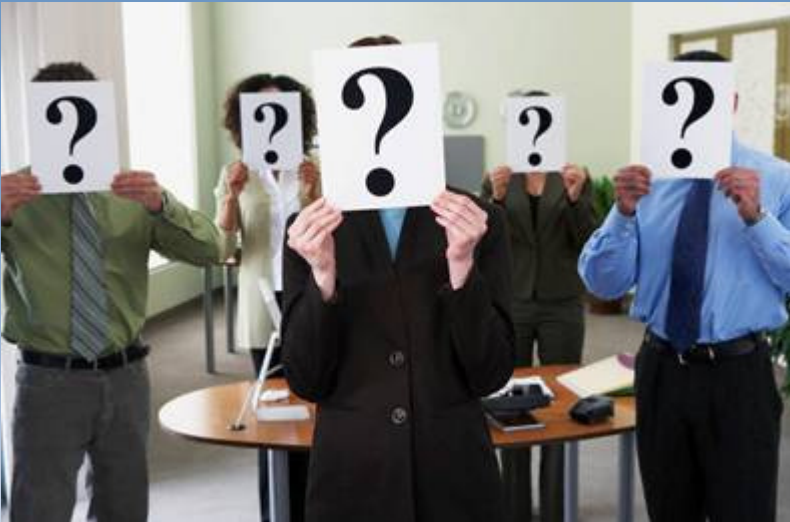
- Forrester Research*

Application topology for a company

Is your IT infrastructure ready for On Demand operation?

IT Infrastructure

New Business Requirements

Customers have questions about their SOA

How do I manage and govern my **IT to be more tightly integrated with my business** needs?

How can I improve my **business processes**?

How can I manage my services for more **reuse**?

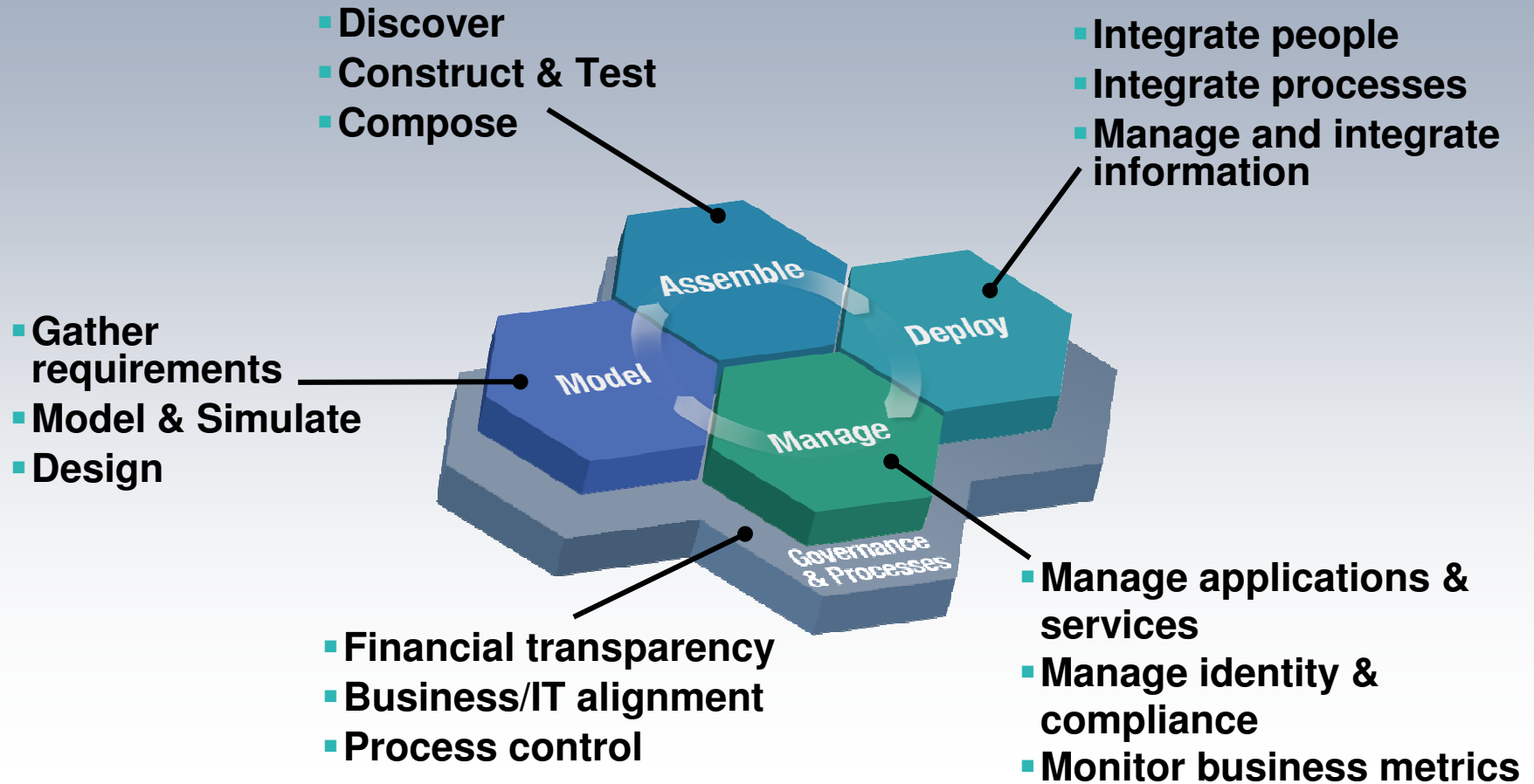How can I understand how my **services interact** with each other?

How do I **manage** my ever growing set of SOA information?

How can I get basic **service statistics** on my services?

How can I **socialize common services**?

How can I have a standard way to **subscribe to services**?

The SOA Lifecycle

- **Discover**
- **Construct & Test**
- **Compose**

- **Integrate people**
- **Integrate processes**
- **Manage and integrate information**

- **Gather requirements**
- **Model & Simulate**
- **Design**

Assemble

Deploy

Model

Manage

Governance & Processes

- **Financial transparency**
- **Business/IT alignment**
- **Process control**

- **Manage applications & services**
- **Manage identity & compliance**
- **Monitor business metrics**

SOA Lifecycle - Integration

WebSphere Integration Developer

Service Governance,

Life-Cycle and Policy

Assemble

Constructs for dynamic and adaptive business services based on an integration platform

WebSphere Registry and Repository

Model and Manage Service Lifecycles

WebSphere ESB Server

Deploy

Feedback for continuous improvement

IBM Tivoli Composite Application Manager (IT CAM) for SOA

Real time management of ESB

Monitor Services Manage Infrastructure

SOA Lifecycle - BPM

WebSphere Integration Developer

Clean hand-off from IT with Business Models, Metrics

Constructs for dynamic and adaptive business processes deployed to BPEL runtime

WebSphere Business Modeler

WebSphere Process Server

Assemble

Run

Model

Manage

WebSphere Business Monitor

Feedback for continuous improvement

Real time management of business processes

How Do We Define Business/IT Alignment?

Collaborative business and IT decision making that ensures:

- *IT investments are made based on business priorities*

- *IT service delivery provides a business result*

- *Business priorities are assessed with IT capabilities and limitations in mind*

*"The process through which business people and IT delivery organisations collaborate to create **an environment in which investment in IT and delivery of IT services reflect business priorities** … in which business priorities are influenced by understanding of IT capabilities and limitations."*

"On IT-business Alignment"
Macehiter Ward-Dutton, Feb 2005

Align Business and IT with SOA Governance

What is SOA governance?

- Decision making rights, and measurements and controls across the lifecycle of services

Value of SOA Governance

- Mitigate business risk and maintain control of SOA projects
- Improve team effectiveness

"IBM's approach aligns with Gartner's view of SOA governance, and we believe it is likely to be more effective than narrower approaches."

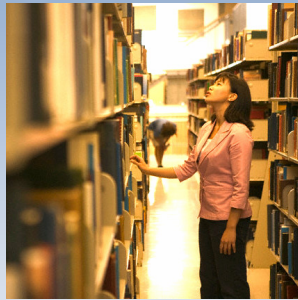Gartner, "IBM Takes Another Step Toward Its SOA Governance Vision", Michele Cantara et al, March 28, 2006.

Gartner

IBM WebSphere Service Registry and Repository

WebSphere Service Registry and Repository Capabilities

Publish

Find

Subscribe
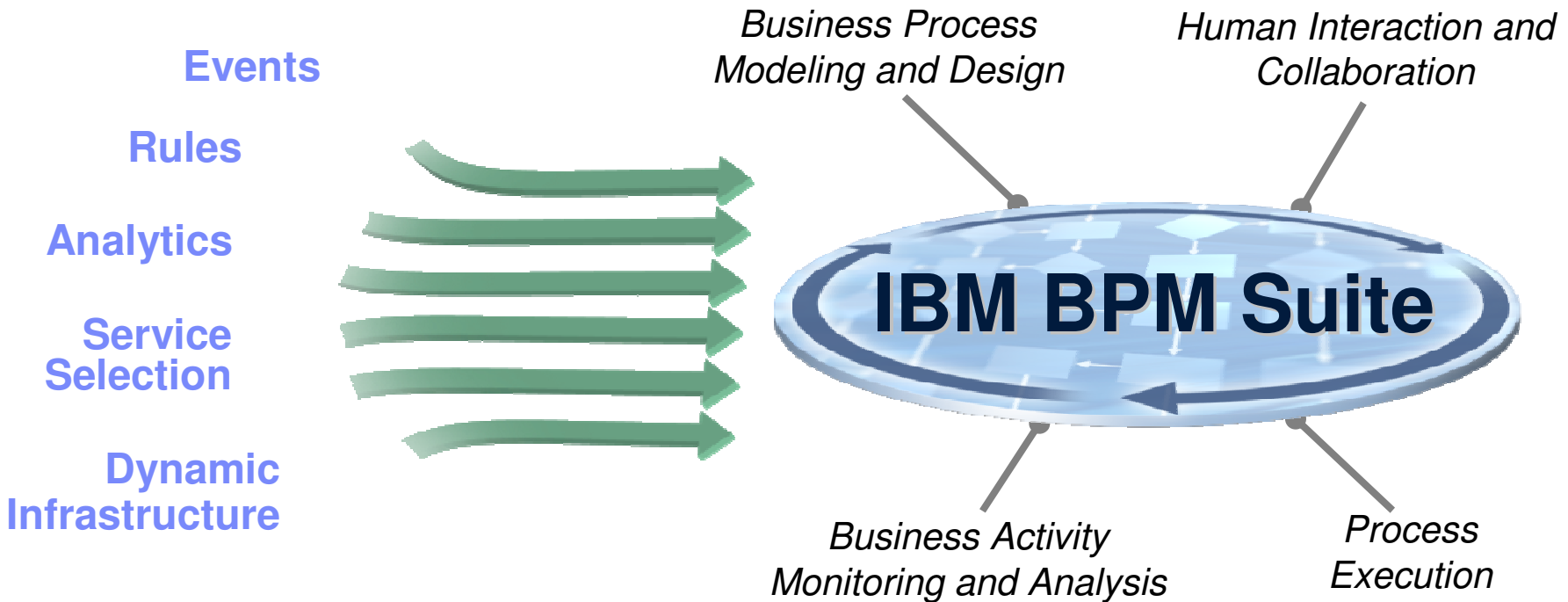
Manage

Govern

Answers… What?... Where?... Why?... How?... of services in your SOA

Enabling the mix of IT Stability and Business Agility
IBM's BPM Capabilities For Adapting and Responding Dynamically

Points of Agility:

Events

Rules

Analytics

Service Selection

Dynamic Infrastructure

Business Process Modeling and Design

Human Interaction and Collaboration

IBM BPM Suite

Business Activity Monitoring and Analysis

Process Execution

Summary - An On Demand Business

- Business processes are integrated end-to-end

- Across the company and with key partners, suppliers and customers,

- Enabling it to respond with speed

- To any customer demand, market opportunity or external threat.
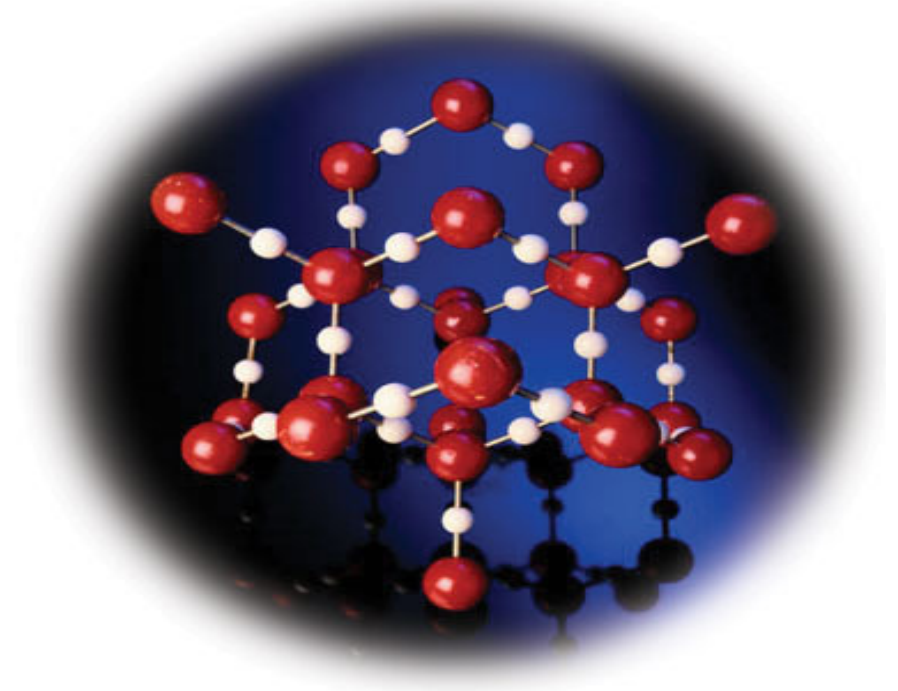
Business Process Simulator illustrates SOA concepts

- Innov8 ("Innovate") Business Process Simulator

- Online and downloadable gaming tool
  - ▶ Used in academic environments
  - ▶ Online version freely available

- One the web
  - ▶ http://www.ibm.com/innov8

- Video trailer
  - ▶ file://c:/tmp/innov8.flv