



智慧点 红动未来



2011 IBM主机软件高端客户年终大会

新一代核心银行发展趋势 Core-Banking Modernization Trend



- Leo Yeung 杨裕德
- 金融业解决方案架构总监



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议程

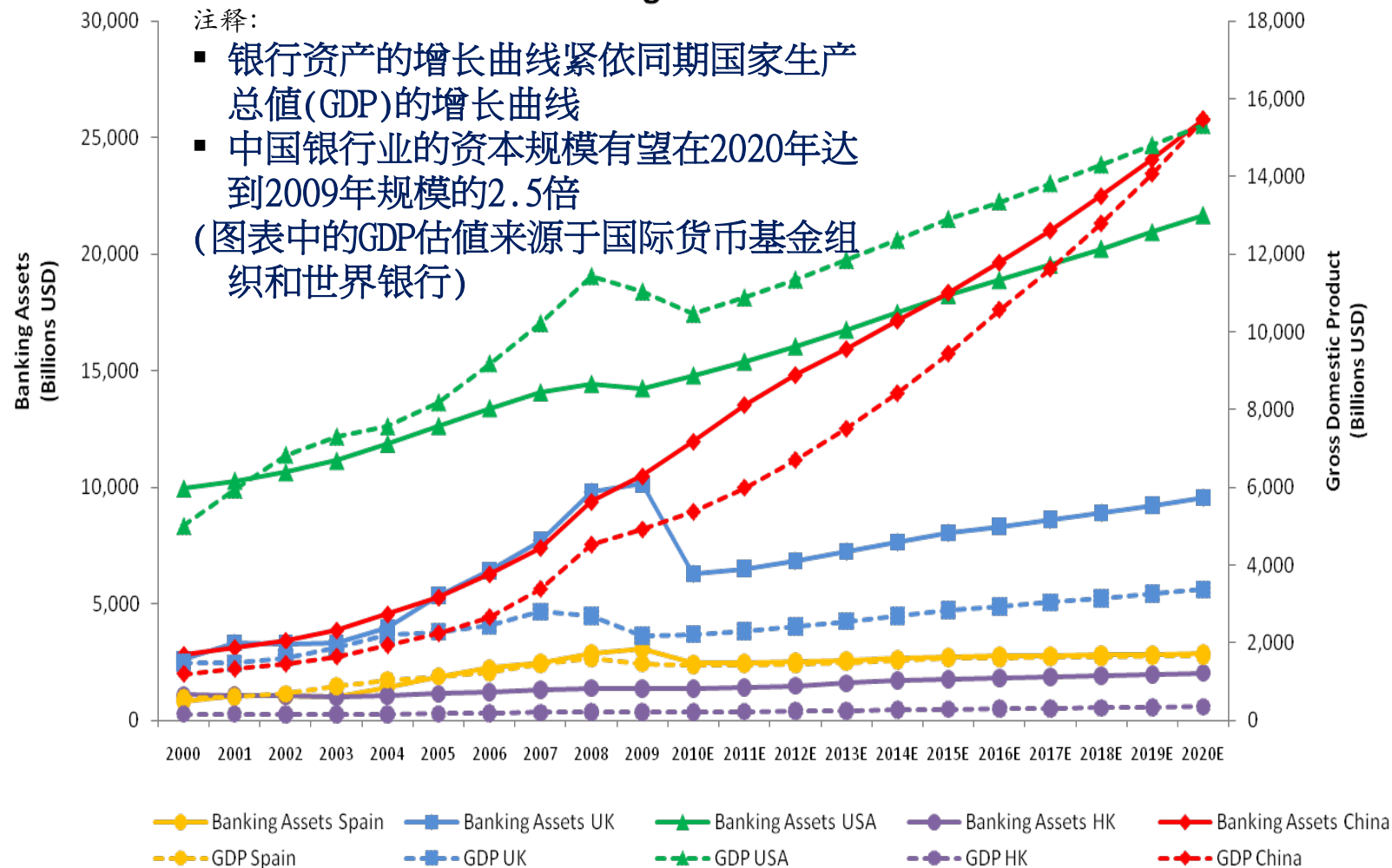
➡ 银行业趋势 (Industry Trend)

- ▶ 核心银行系统转型架构观点 (Core-Banking System Transformation Architecture Point of View)
- ▶ 企业转型基础支持技术 (Enterprise Transformation Foundation Technology)

中国银行业正处在一个高速增长的市场环境中

China's banking sector is in a high growth market environment

2000-2020 Banking Assets and GDP Growth



实现银行系统现代化的主要因素

银行系统所面临的一些关键问题迫使银行推动核心系统改造

不能支持复杂、高度相互关联的产品及其关系

(产品管理)

不能提供多层面的客户管理信息

(客户信息管理)

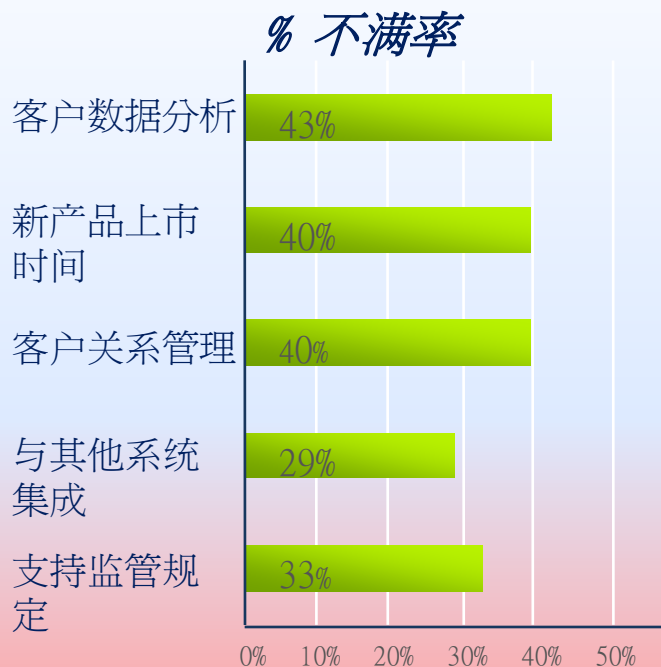
由于对老技术的依赖，竖井式开发和定制，造成灵活性不足

(竖井 & 定制)

需要较长的开发时间，以支持新产品的引进

(开发实施)

银行对现有的核心银行系统能力
不满



无法适应新的和更复杂的风险管理框架

(风险管理)

不能提供今天的金融管控环境所需要的控制信息

(信息管理)

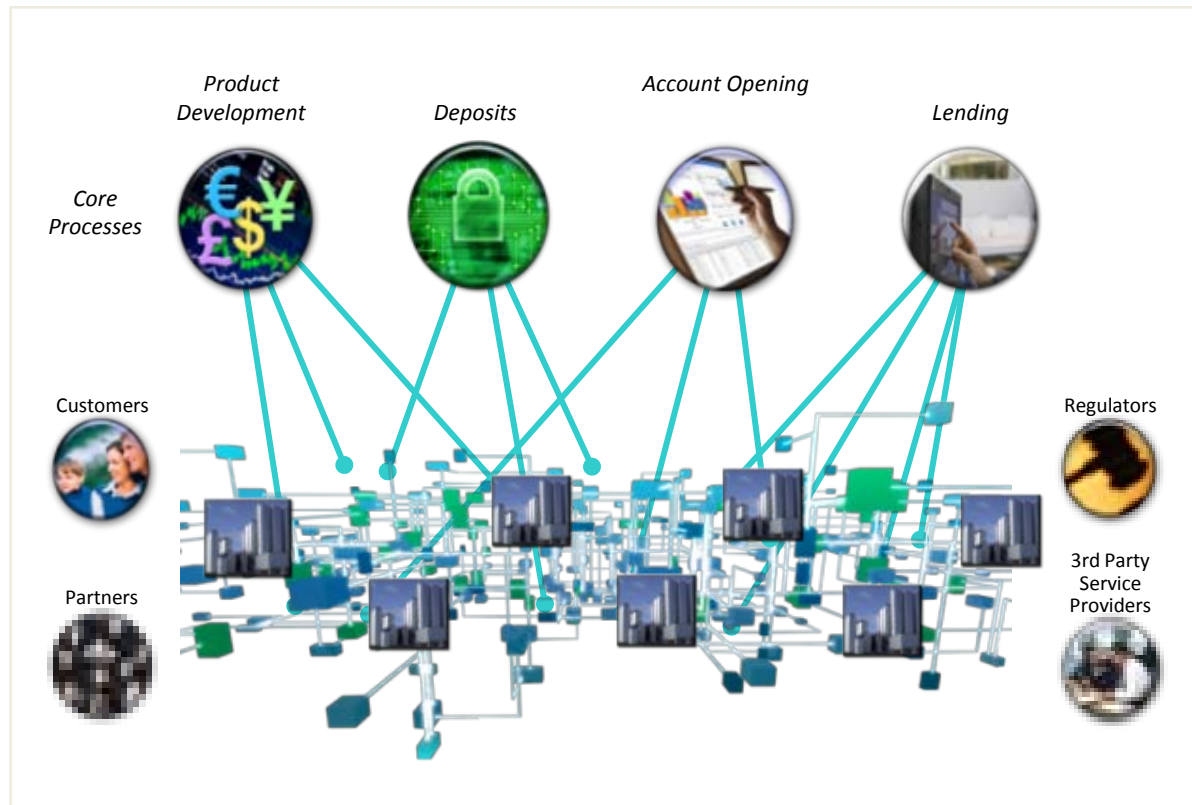
不能支持向更有效率和更有效果的交付能力进行转变

(交付)

不能有效地和新的应用，如数据仓库 及客户关系管理等进行连接

僵化旧传统应用和竖井数据成为推动银行系统现代化的挑战

Hard-coded Legacy System and silo data presents major challenges to banking system modernization



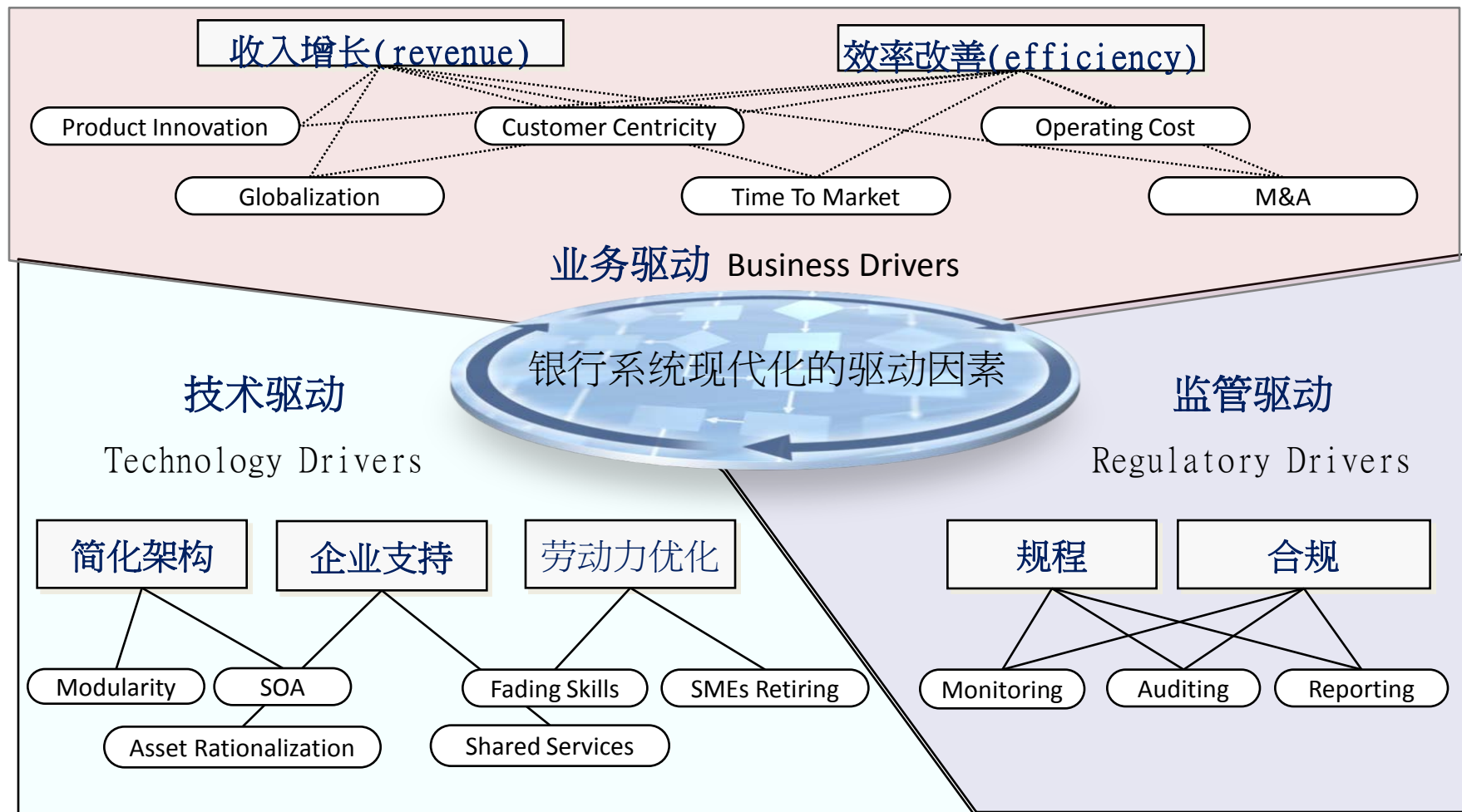
- Core banking processes are supported by **internally developed or highly customized** legacy applications. (紧耦合 **tightly coupled**)
- Processes are **hard-wired** in applications and difficult to change. (硬连接 **hard-wired**)
- 应用变得越来越复杂 (复杂系统 **complex system**)
- Many systems **do not support a “product” concept** (没有产品理念)
- **Business logic** is factored into user interface components and backend applications rather than a middle-tier (没有分层理念 **no layer separation**)
- Many are built as **siloed** applications with master data embedded within each application (硬编码 **hard-coded**)

银行**70%+** IT成本是花费在 传统应用维护 (maintenance)

低于**30%**是正在用于支持**差异化，创新和新产品** (innovation and new products)

银行系统现代化的主要推动力

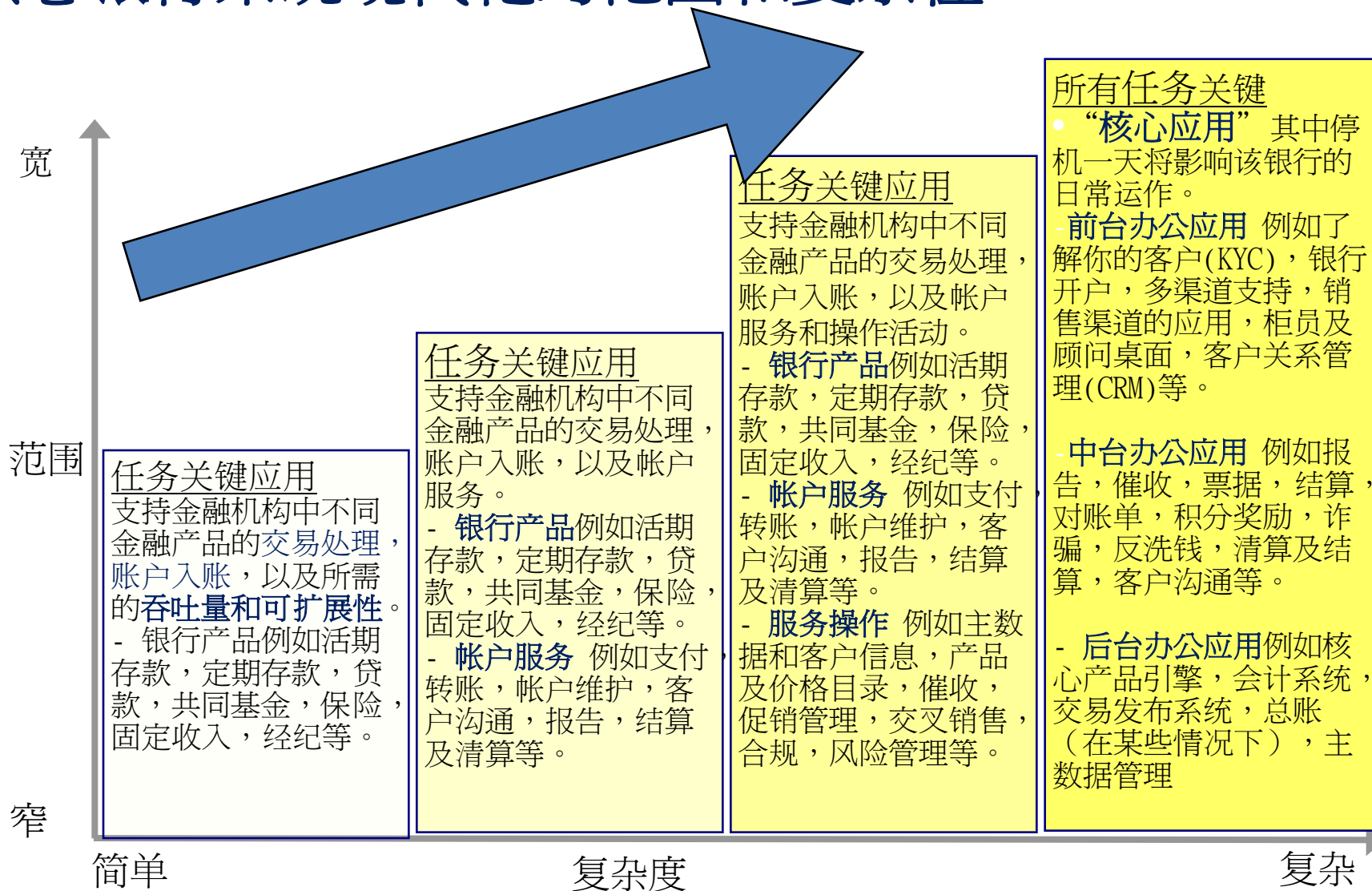
针对来自业务，技术和监管方面的驱动因素，银行正关注核心系统的现代化



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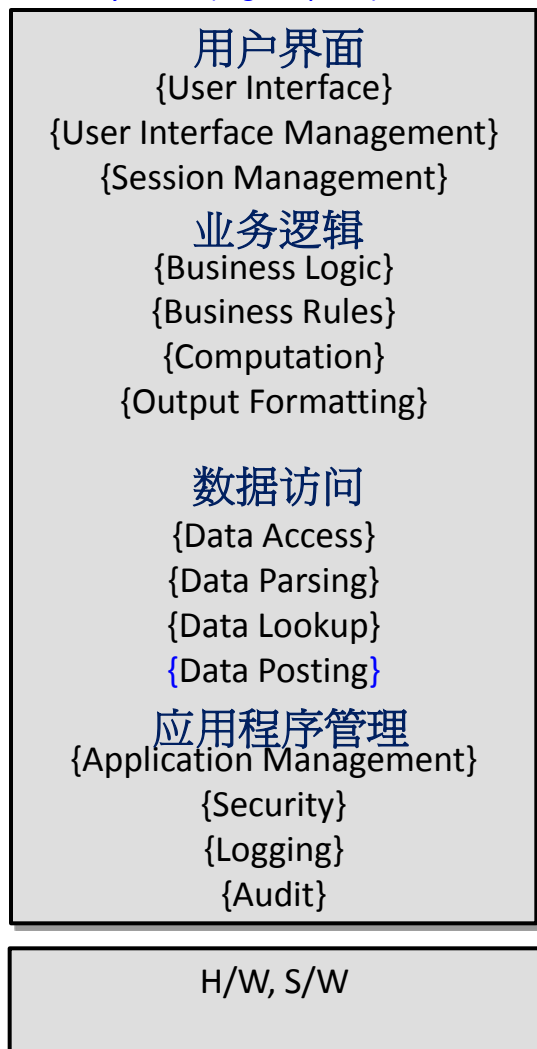
核心银行系统现代化的范围和复杂性



核心系统那方面真正体现了问题？

So what aspects of core systems really manifests the problem?

Core Systems (e.g. Deposit) Architecture



- Green Screens
- Need to open multiple applications →
- Limited ability to address
- Difficult to change application functionality to hard coding →
- Duplication of business capability across many applications →
- Multiple point-to-point connections →
- Application code are interconnected top to
- Code duplication →
- Dead code pool
- Multiple versions of COBOL compilers
- Old Platforms

Impact

Time to Market 上市场生产速度

- Development time for new business capabilities are long
- Difficult to address market opportunities in timely manner

Complexity 复杂性

- Difficult to manage
- High Risk
- Performance & Scalability Issues

Cost 成本

- High cost of maintenance
- High cost of development
- Longer and complex integration testing
- More people more and time to make change happen

Revenue 收益

- Difficult to address customer centricity
- Difficult to increase average revenue per customer

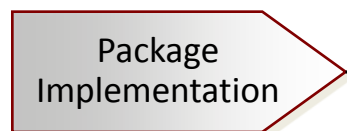
核心银行系统的现代化为适应多种方法

Banks adapt multiple approaches for core banking systems modernization

Core Banking System Modernization Approach

Key Characteristics

打包软件实施



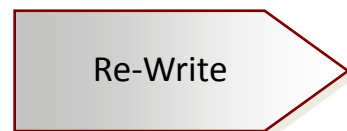
Rip & Replace

- Lack of knowledge, skill sets and documentation
- More than 80% business requirements met by a package solution
- Bank is willing to compromise on day 1 functionalities

Progressively Replace

- Really old systems. Lack of knowledge and skill set
- Rip and replace is not an option as bank cannot compromise on day 1 functionality offered via package
- Package solution can meet upto 80% of business requirements

重新编写



Re-Write

- Systems are too complex to be replaced by package solutions or undertaking legacy modernization. Best option is to re-write again
- Lost documentation
- Legacy analysis proves too cumbersome and expensive

传统现行应用系统的现代化

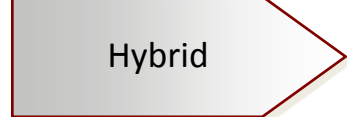


Progressively Modernize

Legacy Applications

- Legacy systems old, has many cascading dependencies and contains years of organic development and differentiated capabilities that are not available in packages
- Package solutions can only meet upto 50% business requirements
- Banks want to undertake a step orderly modernization driven by solving priority pain points
- Banks wants to harvest its legacy and the differentiated capabilities

现行应用系统和打包软件集成



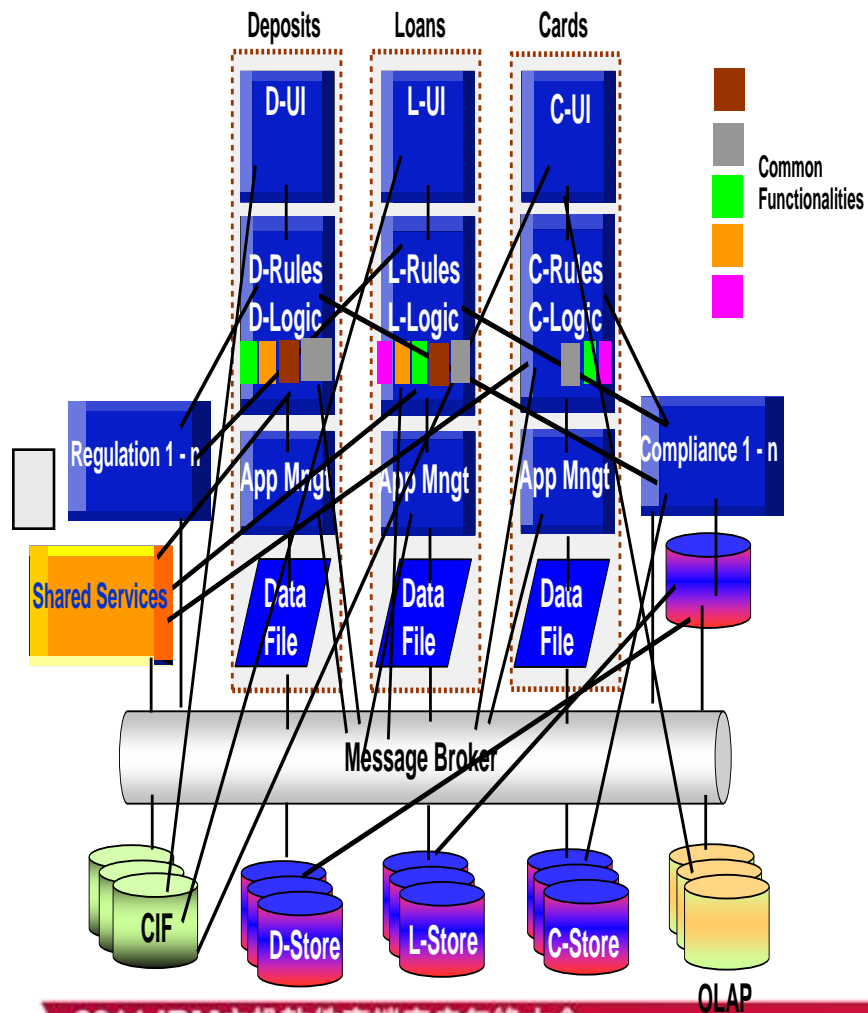
Hybrid

- A combination of other approaches
- Usually targets a contained module for package replacement e.g. trade finance if business requirements are met in package and to address time to market issues
- Choosing package for new markets and modernizing legacy for core
- Tries to mix best of legacy leverage with capabilities from package

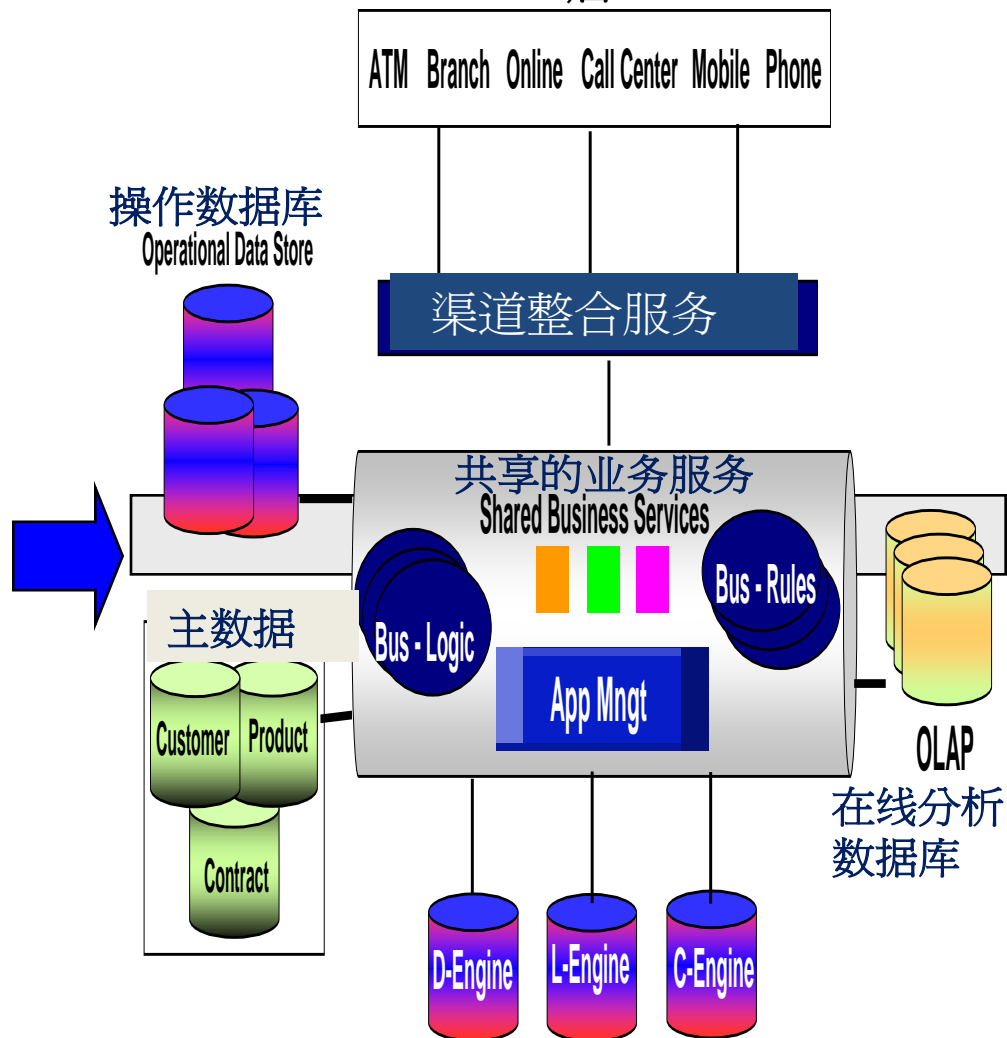
Preferred Choice By Many Banks

核心的现代化 - 架构领导 (Architecture-led)

前



后



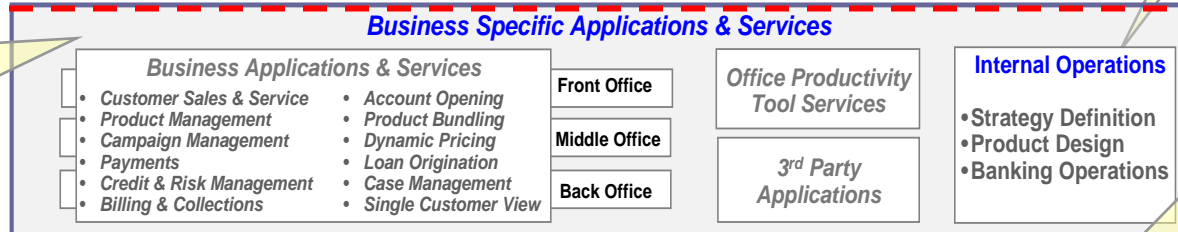
为提高模块化和灵活性，整体参考架构需要分层设计定义 (功能和基础设施) 目标是分离关注点，松散耦合

分离的用户界面。多渠道支持跨渠道地提供一致的客户服务

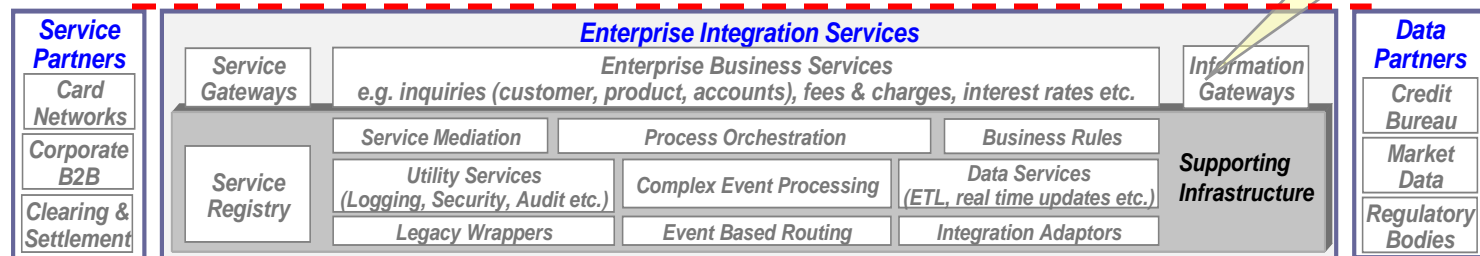


银行工作人员通过对银行架构中的可用服务进行编排可以动态执行不同的银行场景

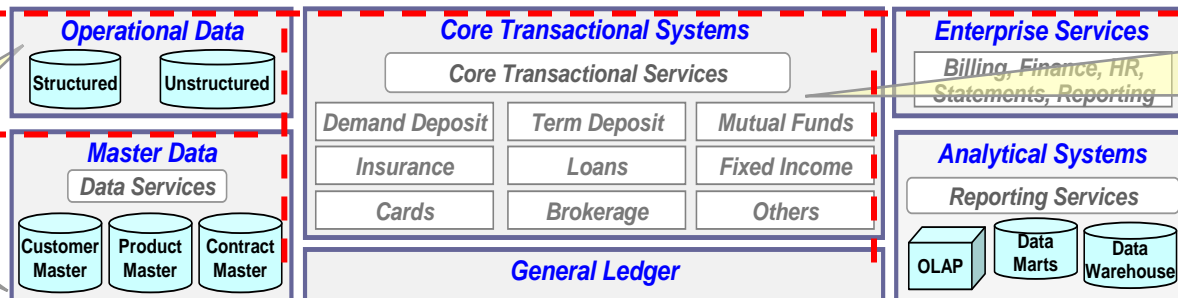
对业务应用进行改造。在共享环境中使用新的或提取出的业务服务



集成层提供的消息中介及连接功能可以避免开发过多的点对点接口



主数据和交易及操作型数据分离



核心产品引擎发起会计系统的交易，并提供可扩展性和吞吐量

以SOA服务为基础的服务集成平台是现代化计划执行的关键

核心银行转型方法

优点

打包软件实施

Package solution

重新编写

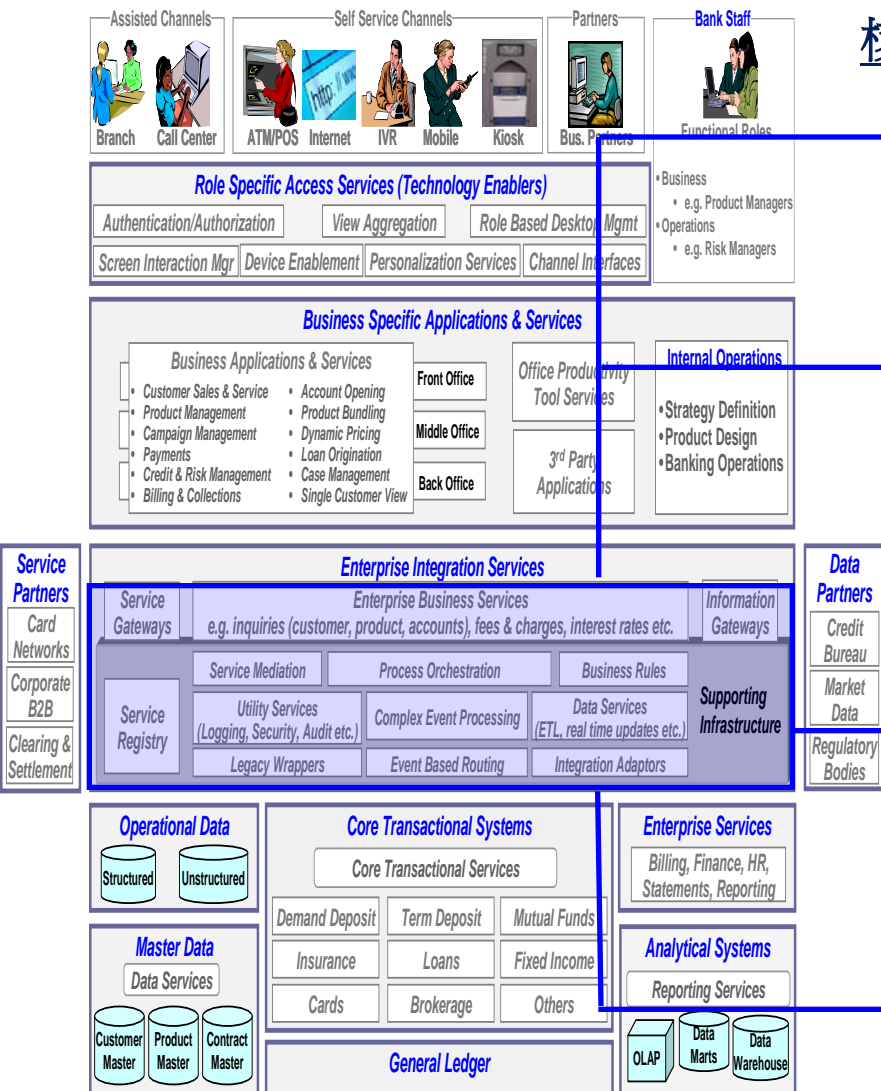
New Creation

传统现行应用系统的现代化

Legacy System modernization

现行应用系统和打包软件相结合的系统现代化实施方案

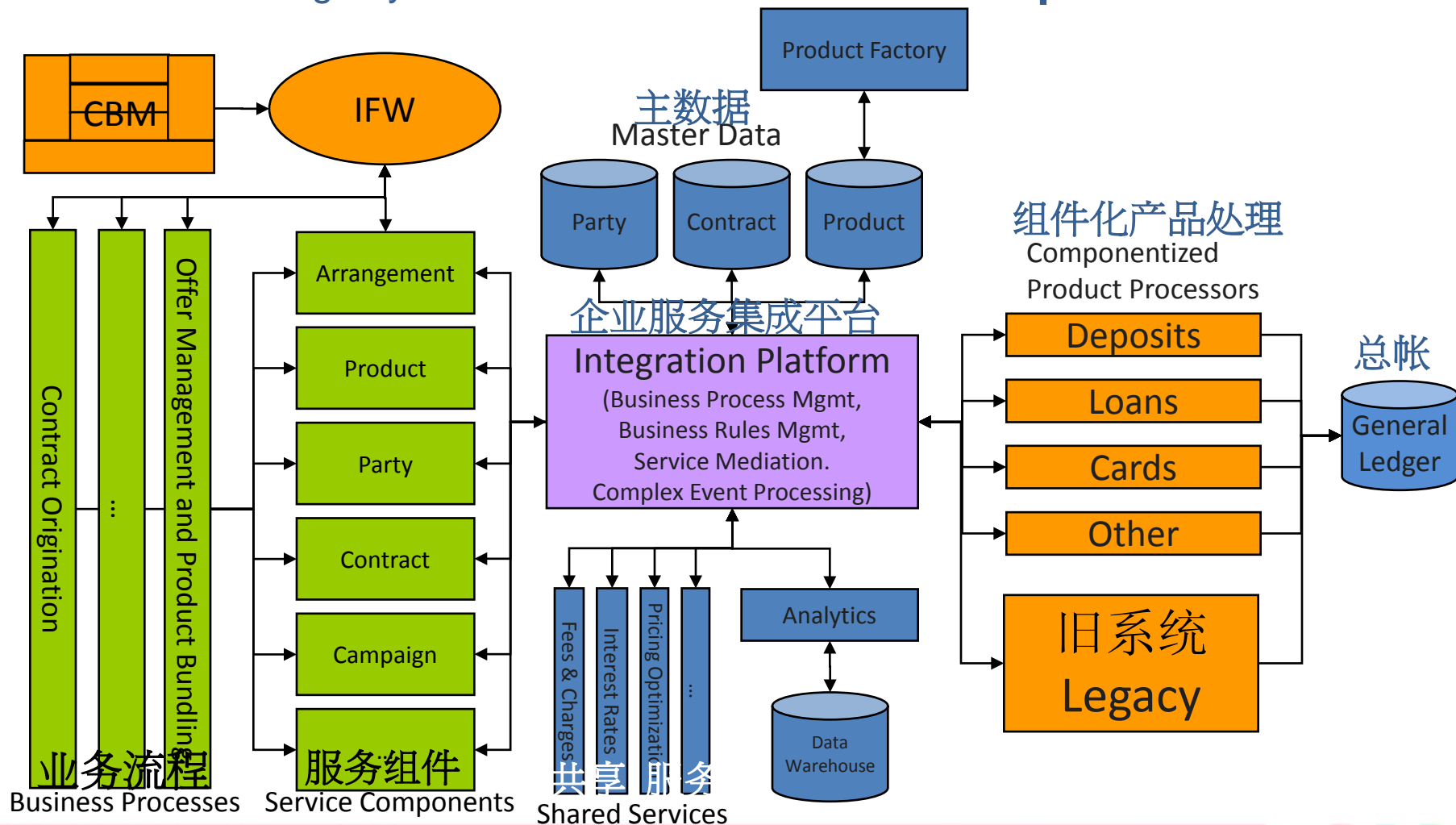
- 在实施过程中避免开发点对点接口以此节省时间和金钱。
- 与现有系统进行集成
- 通过使用集成平台简化未来系统的复杂度
- 提供更好的模块化的体系结构
- 用集成平台实现关注分离
- 用新的架构模式实现应用现代化
- 混合方法对集成能力严重依赖
- 更快的上市时间



新一代核心银行系统的架构和设计: 导向服务, 组件化

Next Gen Core Banking System

Architecture design by **Service-orientation** and **Componentizations**



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技术进步使银行打破摆脱复杂的遗留系统，为现代化建设提供可行的解决方案

Advances in technology allowed banks to break free from complex legacy systems and provide viable solution for modernization

面向服务架构
Services Oriented Architecture (SOA)

- Business solutions are created as sets of **loosely-coupled service components** that can be assembled or re-assembled to support the changing needs of the business

模型驱动开发
Model Driven Development (MDD)

- Business solutions can be developed using model driven architecture for better alignment of business and IT goals

主数据管理
Master Data Management (MDM)

- Master data can be extracted from multiple legacy systems, and centralized to give you an enterprise view information and to support enterprise processes

业务流程的管理
Business Process Management (BPM)

- BPM technologies now enable modeling, execution, and monitoring to enable more dynamic and automated processes

业务规则管理
Business Rule Management (BRM)

- BRM technologies enable automation of process decision points for greater precision, faster change, and enhanced outcomes

旧系统的分析与探索
Legacy Analysis & Discovery (LA&D)

- Banks can identify pieces of business logic hard-coded in applications that can be service enabled to allow siloed applications to participate in enterprise processes

IBM 核心银行转型框架 (CBTF)包括资产，工具，加速器，方法和 S/W产品，帮助银行现代化并和核心银行系统相结合

CBTF is a combination of assets, tools, accelerators, methods and S/W products that help banks modernize and run their core banking systems

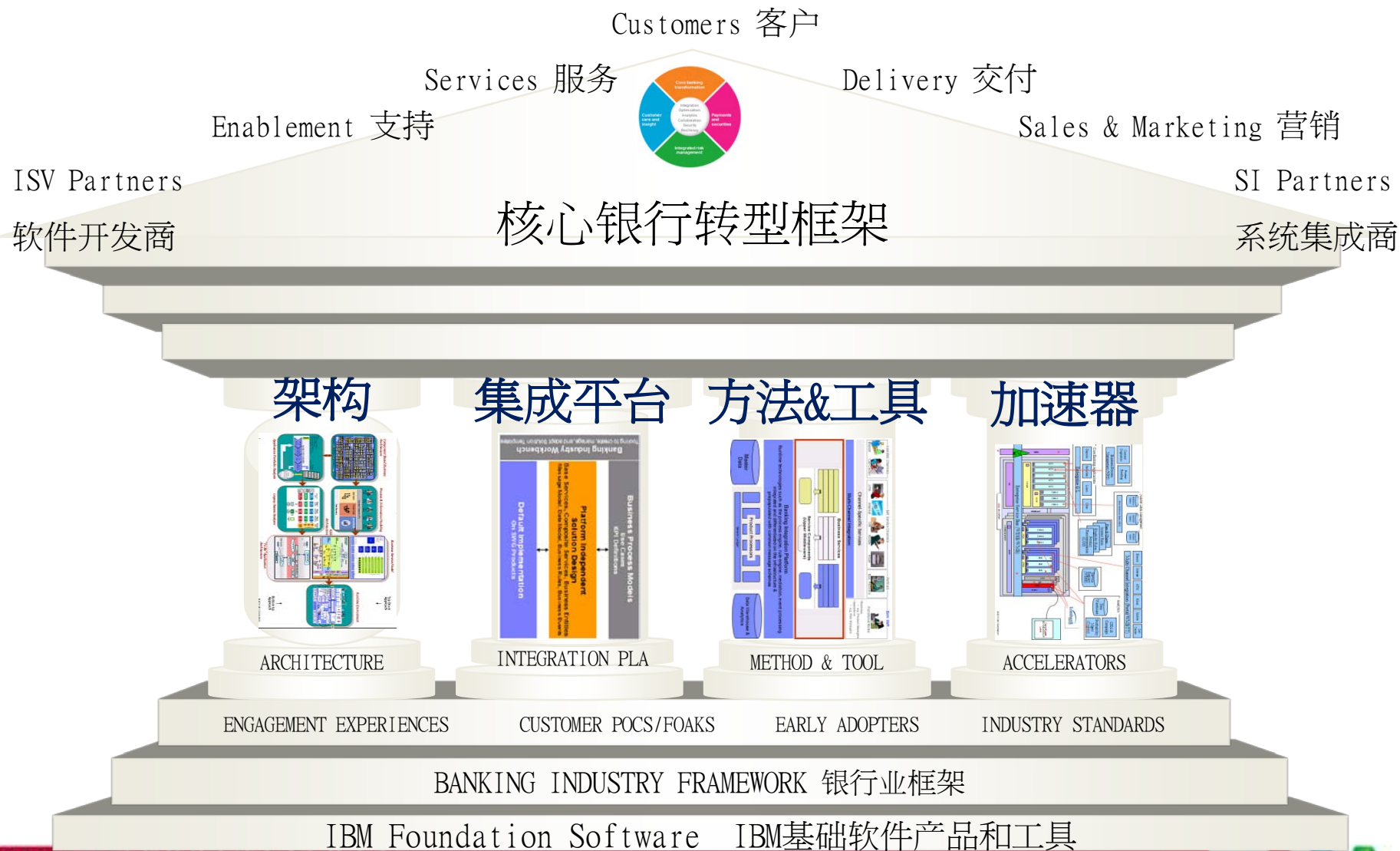
银行业框架



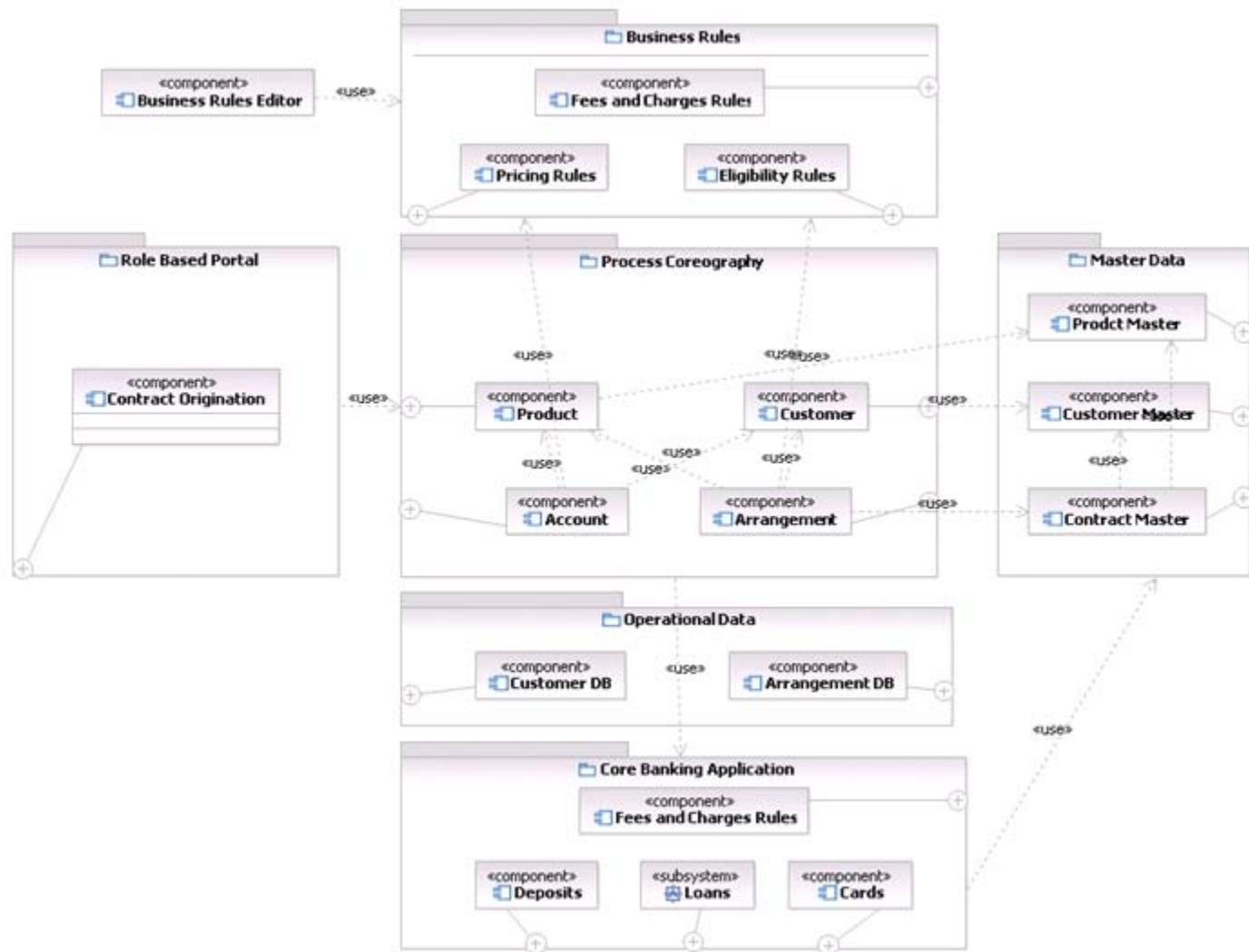
The framework gives you speed, flexibility and choice in deploying solutions while reducing cost and risk!

分析与设计 Analysis & Design	<ol style="list-style-type: none"> 1. Process, data, & service Models 2. Master data templates for customer, product and contract master 3. Solution templates for overarching banking processes e.g. account opening, product bundling etc. 4. Reusable service components to aid application build up e.g. fees & charges, rate calculation etc. 5. Reporting templates and services for analytics 6. Common application level IT foundational services 7. Integration message models 8. Legacy analysis & discovery tools 9. Architectural work products
开发 Develop	<ol style="list-style-type: none"> 1. Integrated banking transformation workbench 2. SOA service components development infrastructure 3. Integration tools with support for mediation & transformation 4. Legacy extraction & transformation tools 5. Business rules development 6. Integration tools for Master Data Management
运行 Runtime	<ol style="list-style-type: none"> 1. Runtime infrastructure and software products 2. Banking extensions and bundles 3. System management tools

核心银行转型框架的四大支柱

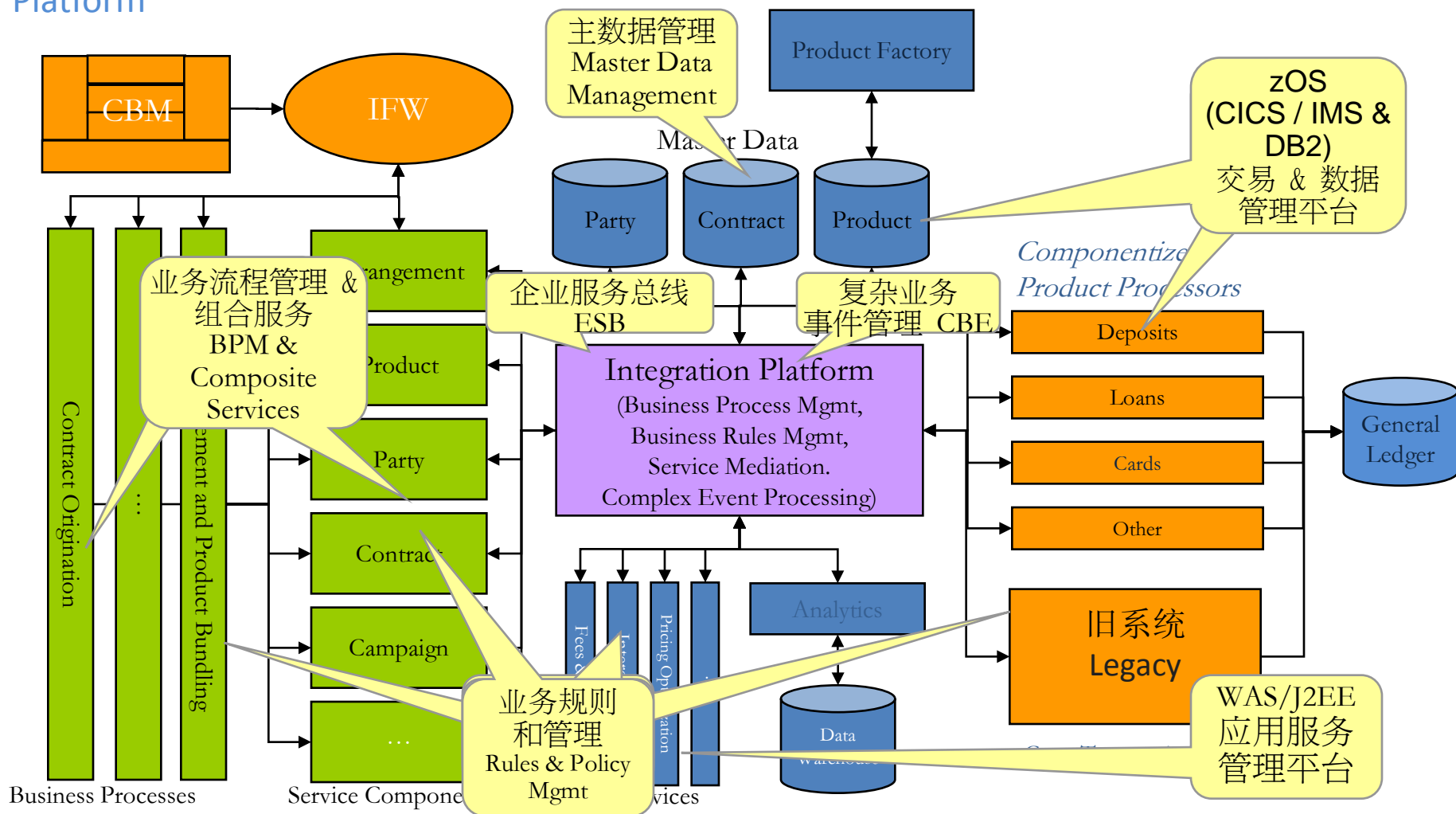


核心系统组件提供组合服务和基本服务的架构实例



通过服务集成平台，充分利用IBM的SOA基础技术组件

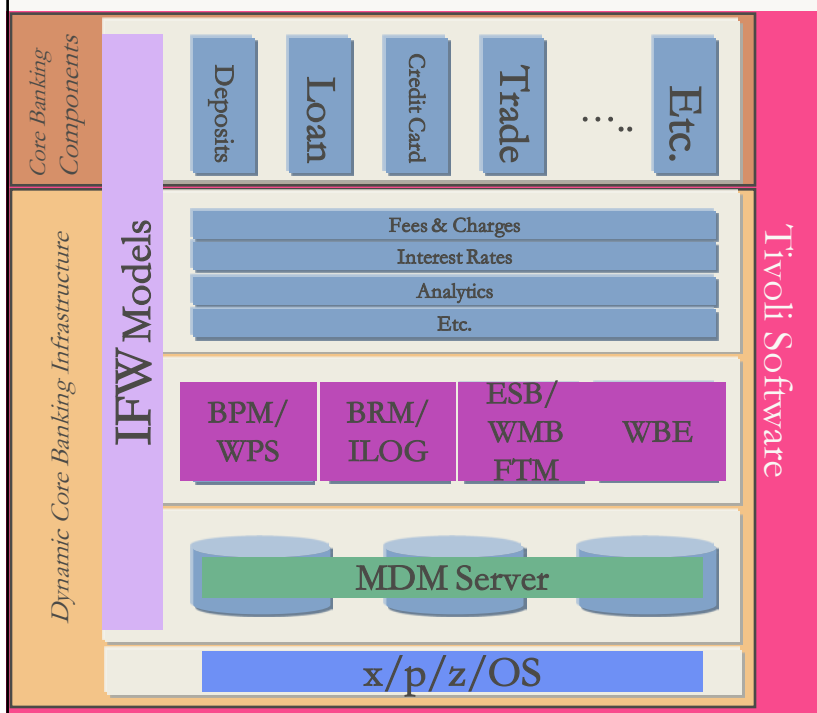
Leverages IBM SOA Foundation Technology Components integrated via Service Integration Platform



IBM SOA 基础软硬件所提供的下一代核心银行系统的运行平台

The run-time platform for next generation core banking systems is provided by IBM SOA foundational software and hardware

Next Generation Core Banking Systems

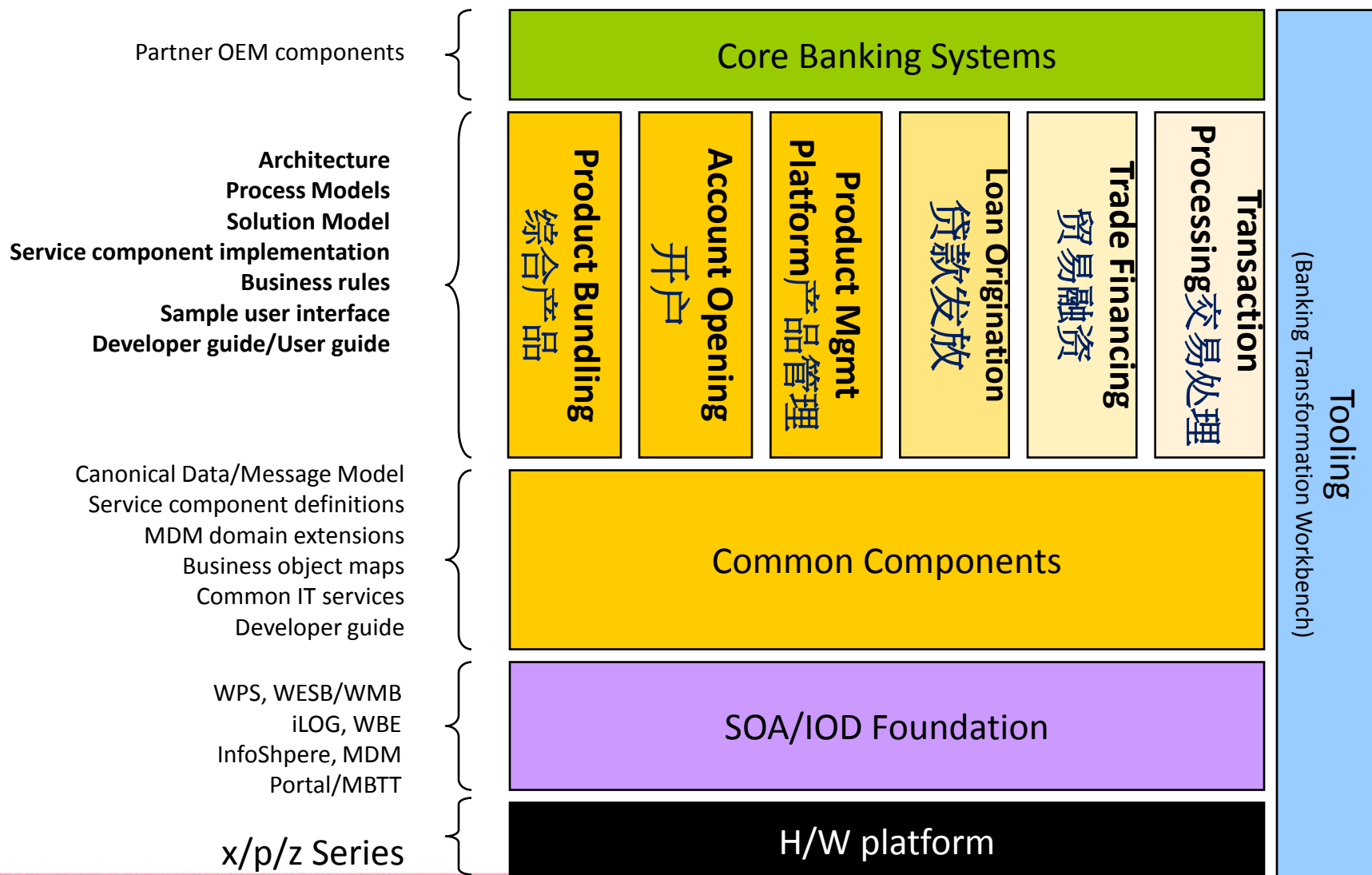


- **IBM OS** provide a scalable high performance computing environment

- **银行业框架模板(Banking Industry Models) : IFW** provides leading/best practices in banking process, services and information modeling
- **业务流程管理 (BPM) : WebSphere Business Process Manager** provides ENTERPRISE level dynamic process orchestration
- **业务规则和策略管理(BRM) : ILOG** provides a robust business rules engine
- **服务集成管理 (ESB): WebSphere Message Broker (WMB)** provides efficient service mediation, **Financial Transaction Manager (FTM)** for Financial Transaction Integration.
- **复杂业务事件管理 (CBEM): WebSphere Business Events (WBE)** supports complex event processing
- **主数据管理: Master Data Management (MDM) Server** provides enterprise data management capabilities
- **系统和服管理 Tivoli** software provides robust IT service management

银行业重点解决方案模板

Industry focused solution templates enhanced from customer engagements



zEnterprise 安置分析工作负载的特性和功能

Workload characteristics and function placement analysis for zEnterprise

Specific platform deployment of client workloads is best determined through the methodologies employed during a Fit for Purpose Workshop.

交易处理
和数据库

A

Transaction Processing and Database

- High transaction rates
- High Quality of Service
- Peak workloads
- Resiliency and security

C

Web, Collaboration, and Infrastructure

- Highly threaded
- Throughput-oriented
- Scale out capable

网络，协
作应用

业务应用

B

Business Applications

- Scale
- High Quality of Service
- Large memory footprint
- Responsive infrastructure

D

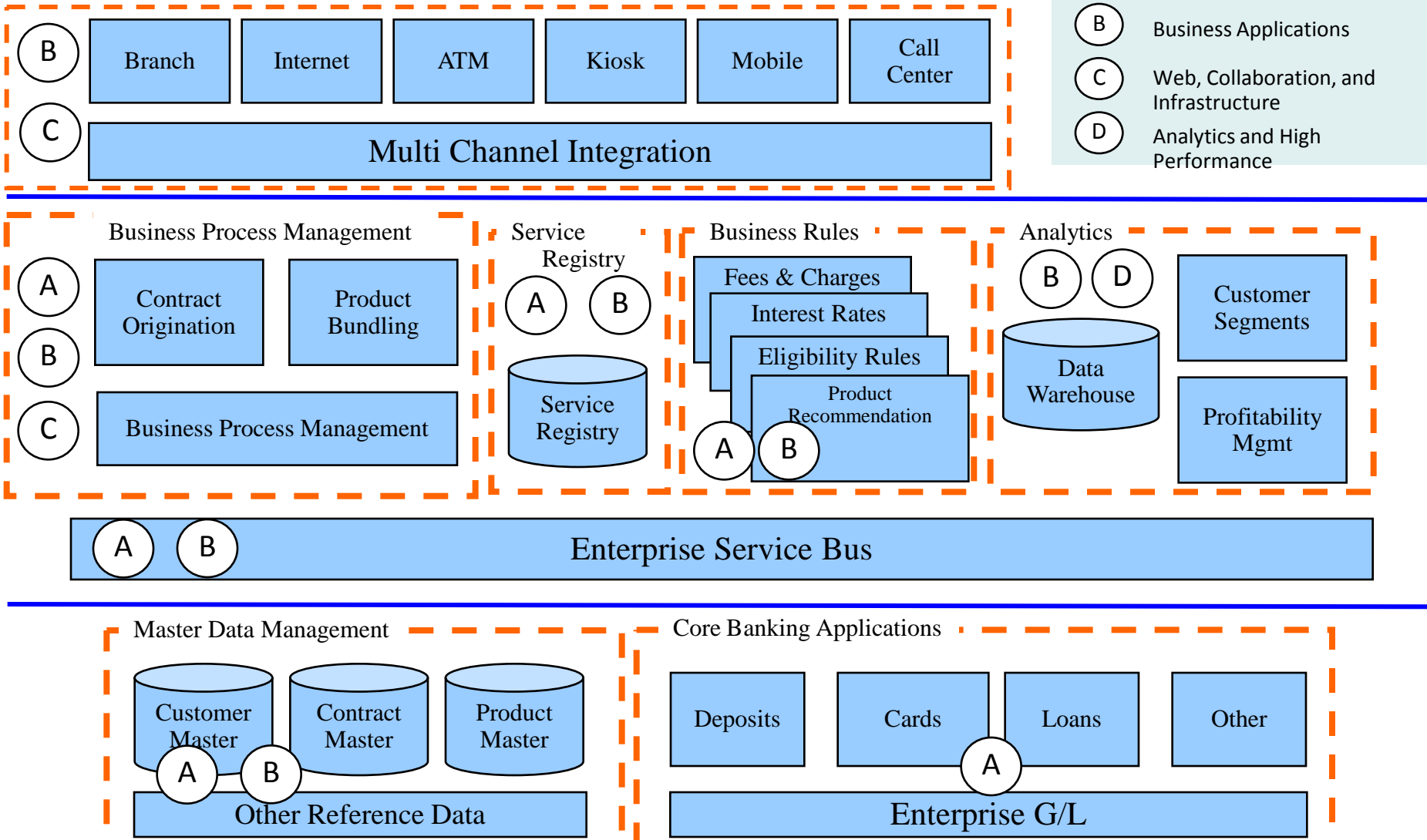
Analytics and High Performance

- Compute or I/O intensive
- High memory bandwidth
- Floating point
- Scale out capable

分析和计
算性能






























zEnterprise 银行工作负载映射

Banking Workload Mapping for zEnterprise



zEnterprise银行的混合集成平台组件

Banking zEnterprise Hybrid Integration Platform Components

Workload Category	Middleware	Platforms	Platform to Component Mapping
Multi-channel Integration	<ul style="list-style-type: none"> WebSphere Portal WMBTT 	  	①
Business Process Management	<ul style="list-style-type: none"> WebSphere Process Server Business Monitor Business Events Lombardi 	  	②
Service Registry	<ul style="list-style-type: none"> WSRR 	  	③
Business Rules	<ul style="list-style-type: none"> ILOG BRMS 	  	④
Analytics	<ul style="list-style-type: none"> Smart Analytics Cognos InfoSphere Warehouse 	   	⑤
Enterprise Service Bus and Connectivity	<ul style="list-style-type: none"> WESB WMB DataPower WMQ 	    	⑥
Master Data Management and Information Integration	<ul style="list-style-type: none"> InfoSphere MDM Server InfoSphere Information Server 	  	⑦
Core Banking Applications and Data Serving	<ul style="list-style-type: none"> DB2 z/OS CICS WebSphere Application Server 	    	⑧

Platform Legend



z/OS



zLinux
Partition



AIX
zBX Blades



Linux
zBX Blades



Data
Power

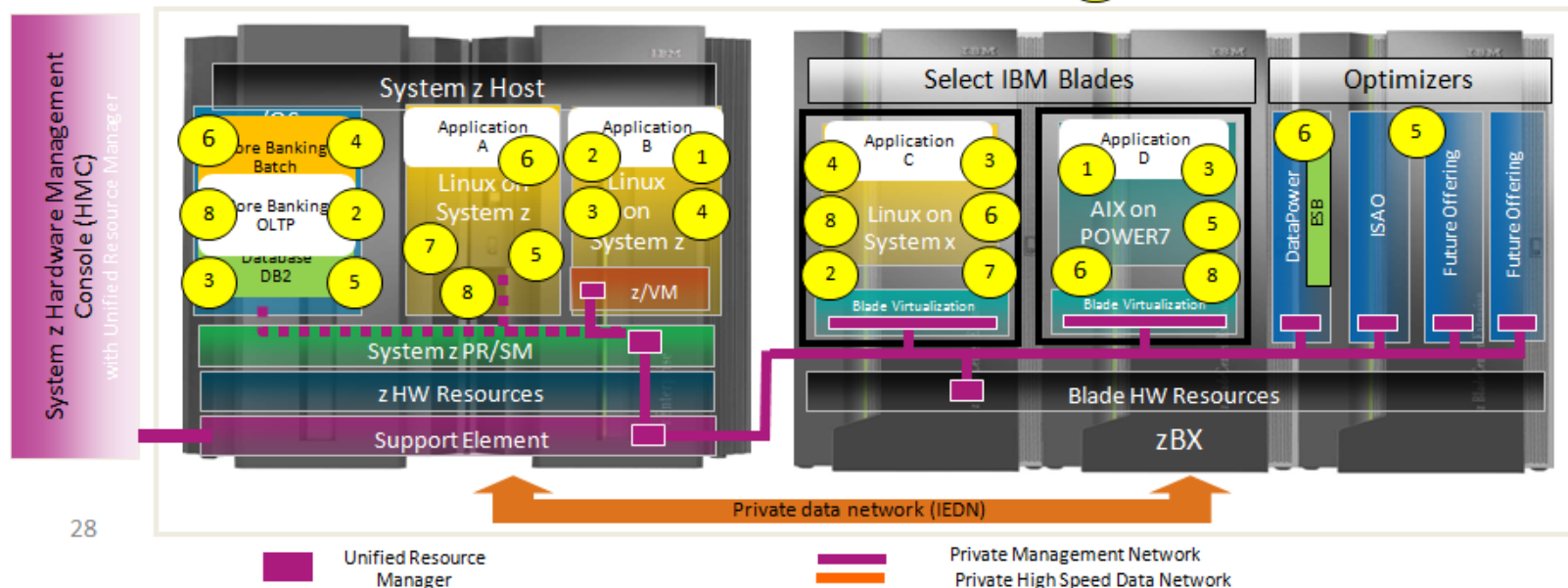
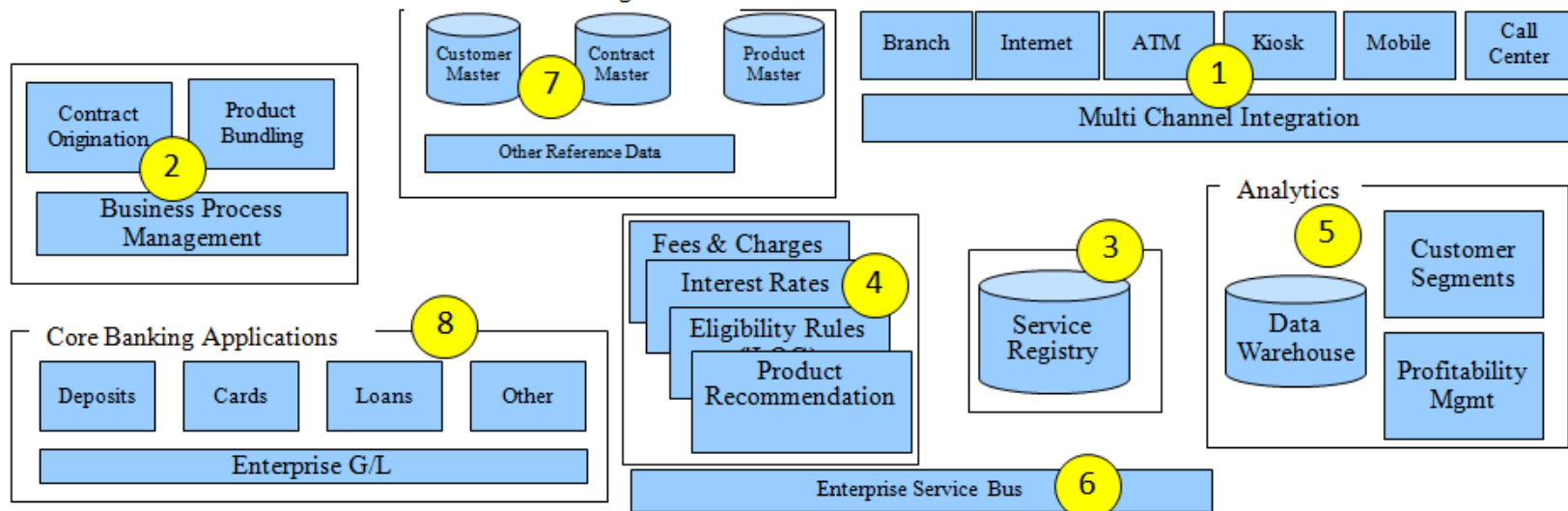


ISAO

zEnterprise 银行工作量的部署选项基于非功能性需求

Banking Workload Deployment Options based on NFR

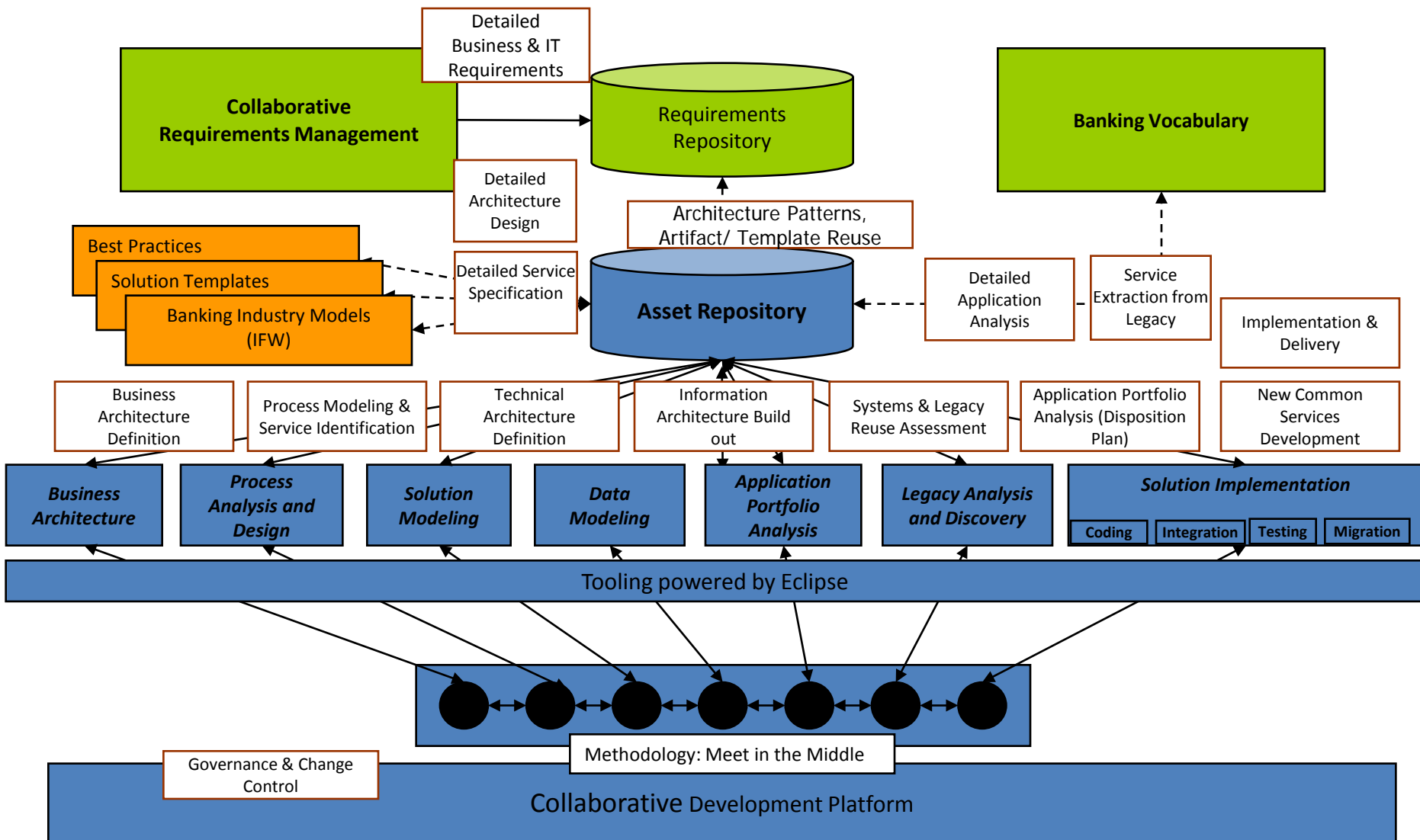
Four Pillars of Core Banking Transformation: Master Data Management, Integration Platform, Analytics, and Core Banking Applications



关键的架构思路 - Key Architectural Considerations

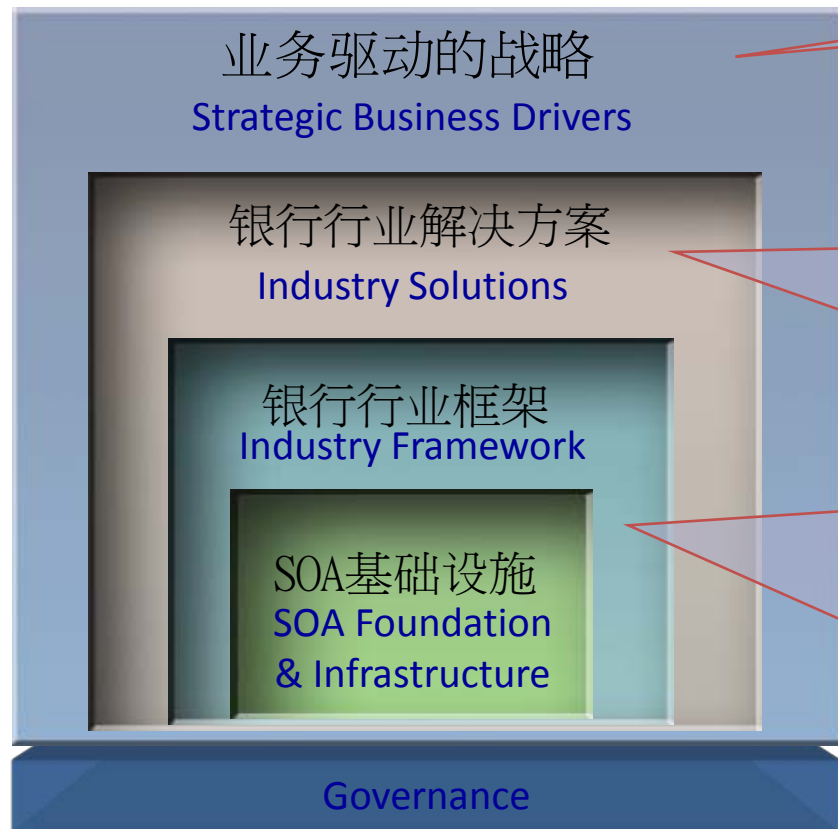
- **SOA based Business driven IT development** 基于SOA的业务驱动的IT发展
Integrated business requirements management and traceability
 - Common business and IT vocabulary
- **Collaborative development platform and integrated engagement management**
协同开发平台和综合管理的参与
 - Method guidance and engagement governance – phases, iterations, iteration plans, work items
 - Integrated development asset repository, promoting cross engagement reuse of artefacts
 - Support for Track-able transformation engagement
- **Realize true potential of model driven development utilizing IBM Banking Industry models**
银行业模型实现模型驱动开发
 - Starting from business analysis to implementation and deployment
 - Automatic and semi-automatic transformations to increase the accelerate development
- **Leverage integrated SDLC tooling portfolio.** 集成的软件开发生命周期工具
 - Extension mechanism for integrating new tools
 - Seamless integration of tools, assets and method

环境 Collaborative workbench can provide consistent vocabulary, integrated tooling and standardized shared development environment to all parties involved in the modernization journey



专业化是一个跨 IBM的使命方向

Industry specialization is a cross-IBM mission



IBM's Industry-specific services + software + hardware offerings are built in context of an industry's strategic business drivers

- i. Where there is high value and demand, IBM *pre-composes composite business services & other IP* into re-usable *Industry Solutions* leveraging ISV capability
- ii. Where demand & opportunity is not yet sufficient, IBM addresses our client's business needs with customized solutions

IBM Global Business Services

Industry Partner
ecosystem

- i. Where there is high value and demand, IBM is *compiling & enhancing software offerings into Industry Frameworks based on SOA* that support the unique needs of each business domain, leveraging ISV capability
- ii. In business domains where demand or opportunity does not (yet) justify creating a new Industry Framework, clients can directly leverage IBM's strong software portfolio & ISV assets embodied by the SOA Foundation

WebSphere.

Rational.

Tivoli.

Information Management

Lotus.

Industry Partner
ecosystem

IBM Global Technology Services

धन्यवाद

Hindi

多謝

Traditional Chinese

Grazie

Italian

ขอบคุณ

Thai

Спасибо

Russian

Gracias

Spanish

多谢

Simplified Chinese

Obrigado

Brazilian Portuguese

Merci

French

شكراً

Arabic

Danke

German

நன்றி

Tamil

ありがとうございました

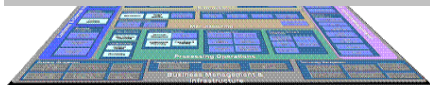
Japanese

감사합니다

转型需要统一视角来进行所有架构层面的分析

Transformation requires an integrated view for all levels of the Architectural Analysis

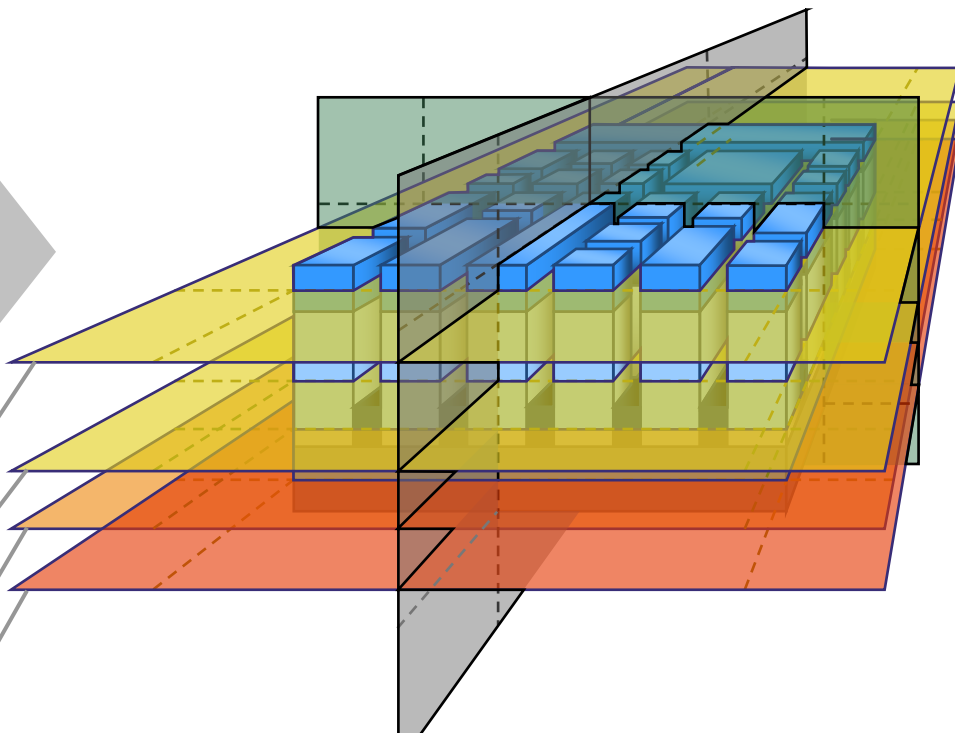
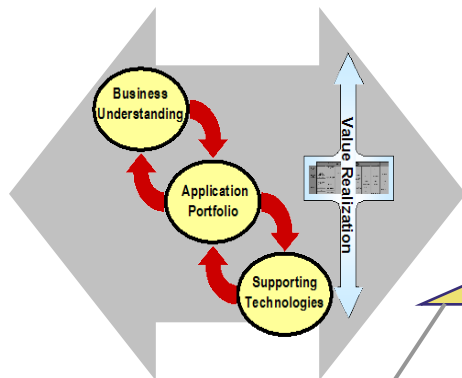
Business Architecture



Application Architecture

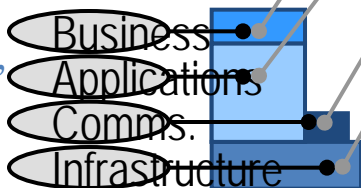


Technology Architecture



Traditional approaches recognize the same three primary layers of analysis, but typically adopt radically different formats for each layer, making the necessary translations between environments overly complex

传统方法同样在这三个主要层次进行分析，但通常在每一层采用根本不同的方式，从而使环境之间的翻译过于复杂



The Componentized approach uses the same business component framework through all levels, allowing business priorities and measures to be easily matched to the underlying designs and technologies



The seamless link between business and technology is key to effective governance and transformation

Different Alternatives for Solution Decision on Granularity

服务标识不同选择的厚粒度

FULL SCOPE

BIG BLOCKS

Granular Service Identification

PROS 优点

System is developed considering all functions at same time, will substitute the existing in big bang

Project is enabled to materialize maximum benefits from advanced concepts (Product Factory-arrangement management....)

- Full perspective on Business Requirements allows for defining common solutions for supporting them
- Specific Project Organization and project responsibilities are needed to realize benefit

Possibility of Obtaining short and long term business benefits

Less Impact on the organization

Less Project Risk

Possibility of stopping the project with business benefits

Reduced risk and impact. Transformation will happen in almost a continuous pace.

Some business benefits

CONS 缺点

Higher Delivery Risk & Higher Organization Impact

Benefits are obtained only at the end of the project when implementation is achieved

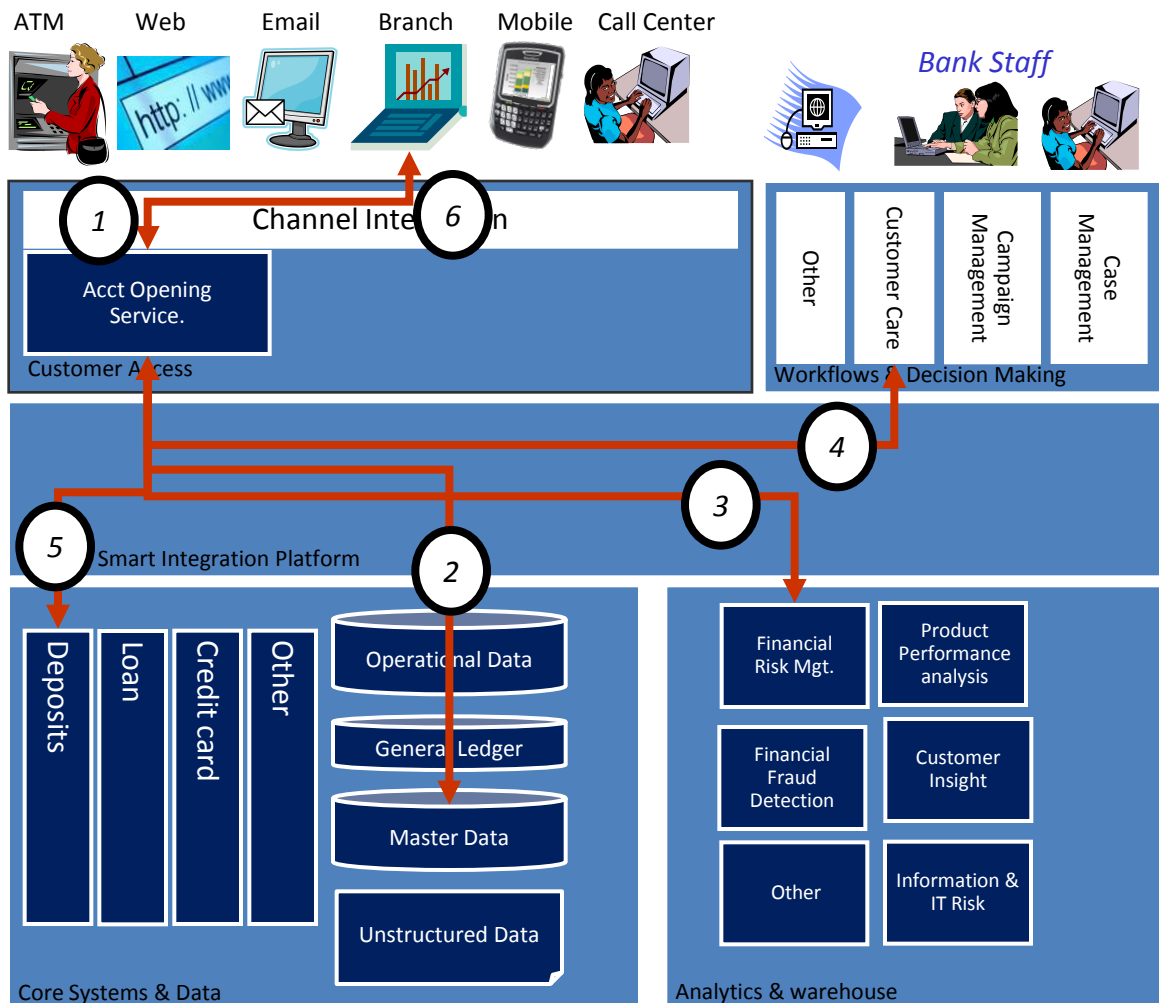
Coexistence in intermediate stages may present some challenges

Some limitations on the maximum benefits available

框架使用面向服务的业务应用：开户范例

Framework Enables Efficient Creation of Service-Oriented Business

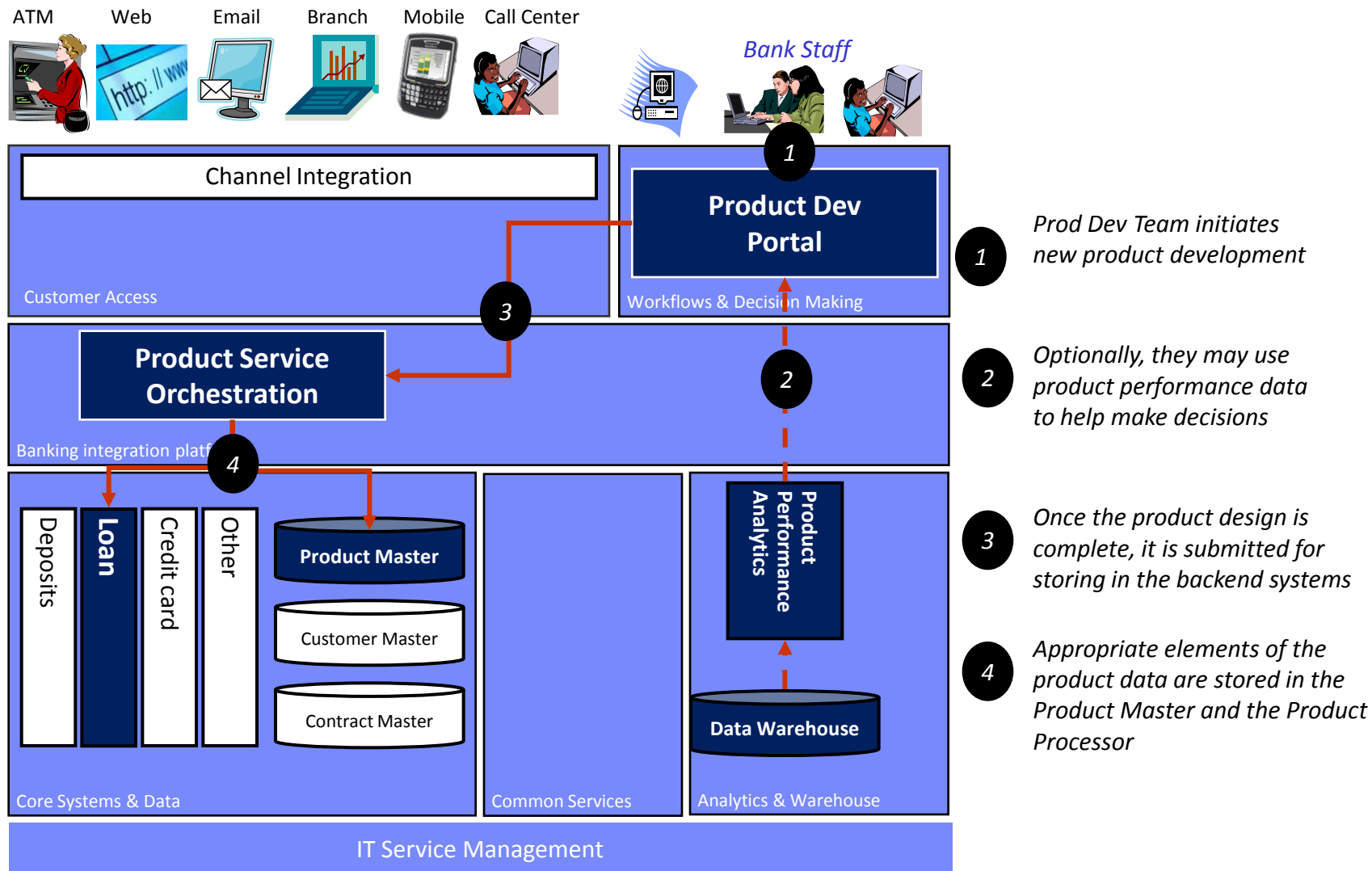
Applications: Account Opening Example



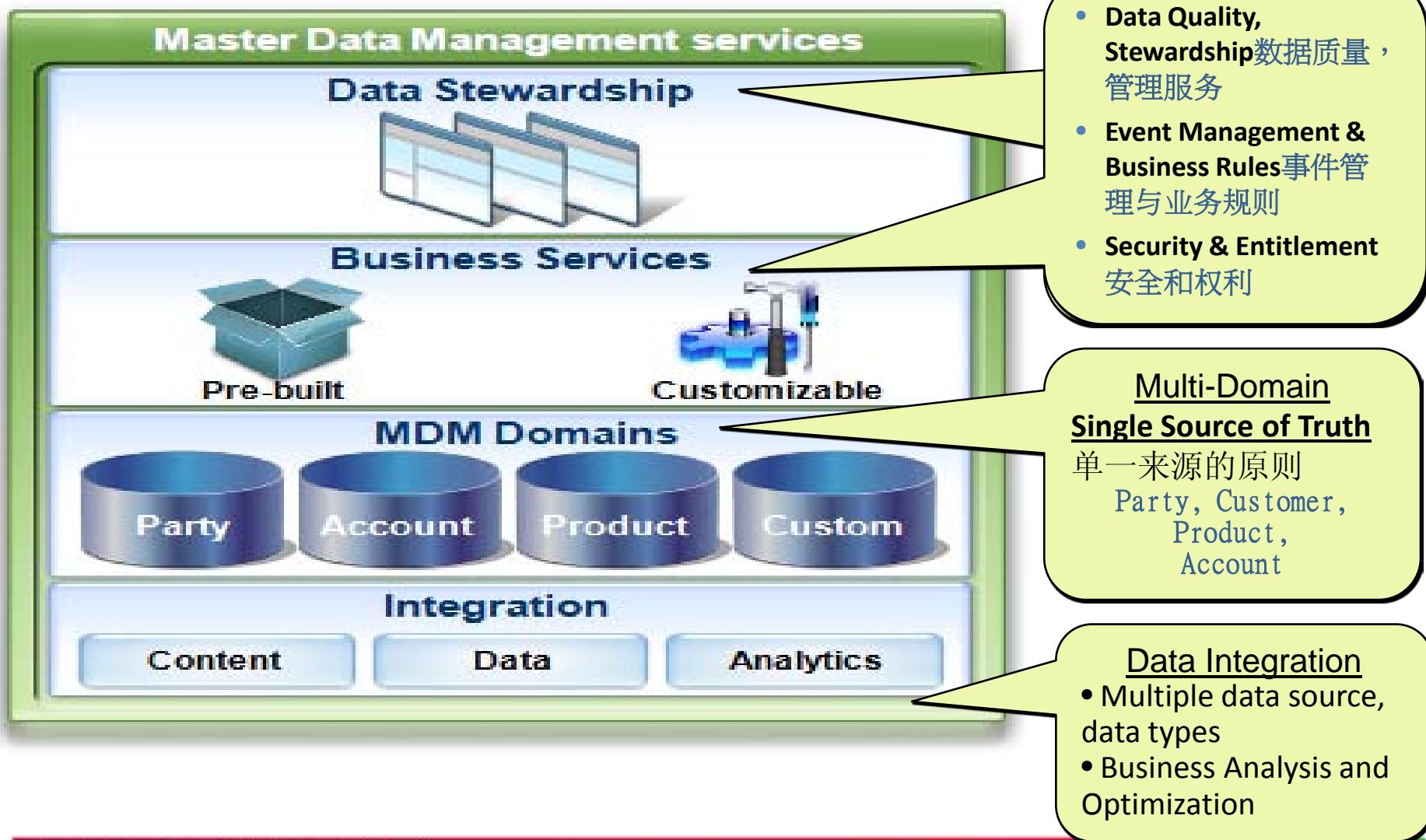
- 1 Customer initiates Account Opening at a Branch
- 2 Account Opening Service retrieves customer & product data from the Master Data repository
- 3 Assess financial risk associated with the customer for this acct
- 4 Customer Care process is triggered so that the bank staff can make the right decisions
- 5 Account is created in the Product Processor
- 6 Account Information is returned to the customer

产品的创造 – 高层次交互图

Product Creation – High Level Interaction Diagram

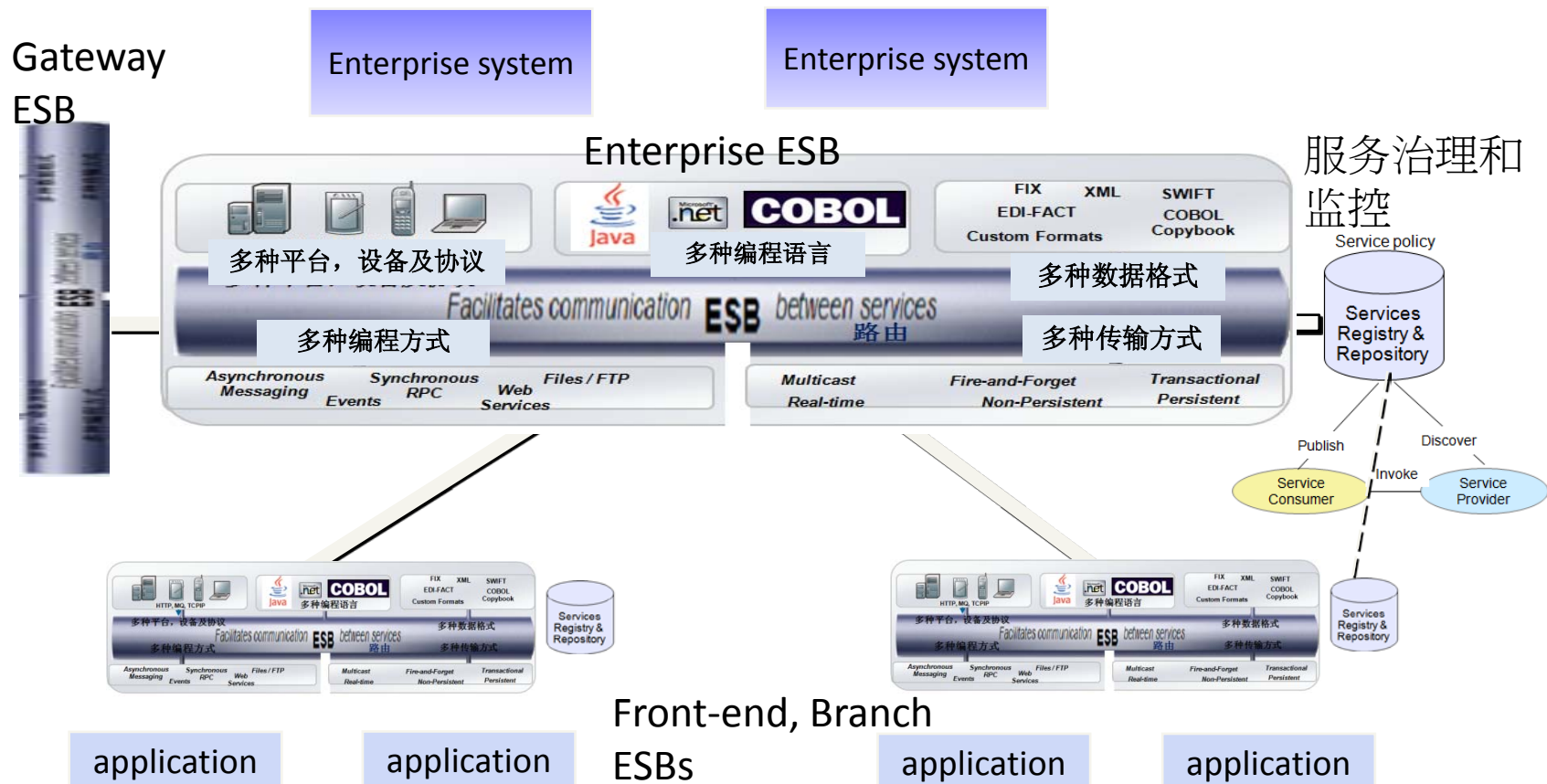


Enterprise Master Data Management Support Core System current and migration to target state Environment



Enterprise Integration Platform: ESB 企业服务总线

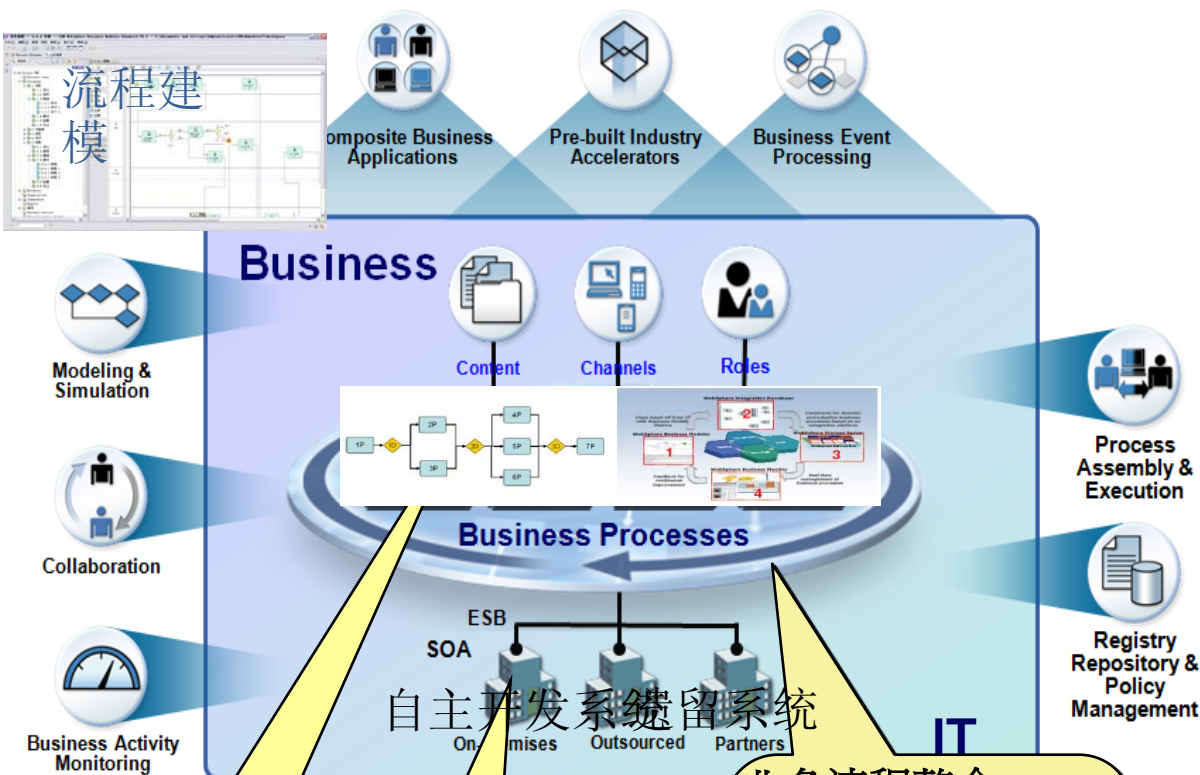
- An ESB is an **SOA integration infrastructure** **SOA集成基础设施** that supports **virtualization and management** **虚拟化和管** service interactions between requesting and provider applications.
- Enterprise Integration Platform will **manage connectivity** access with business and IT policy through SLAs for existing legacy applications, newly developed or packaged applications for external, front, mid and back office supporting **NFRs (performance, scalability, manageability, and security,...)**.



联邦式的连通方式，在不影响任何现有应用系统的前提下，虚拟化地连接各种
Application Services

Enterprise Business Process Management Platform 业务流程管理

- IT implemented business processes to respond quickly to business demands when enabled with BPM capabilities



Functional Capabilities

- Dynamic SOA Capabilities
 - Business Services
- Role-based User Environment 角色的用户环境
 - Human and Automated tasks
- Business Process Modeling and Analysis 流程建模和分析
- Business Activity Monitoring 业务活动监控
 - Business Goal, KPI
- Business Rule Management 业务规则
- Business Event Processing 业务事件管理

企业级跨多个业务系统的流程

系统内部流程在保留在应用内部

业务流程整合

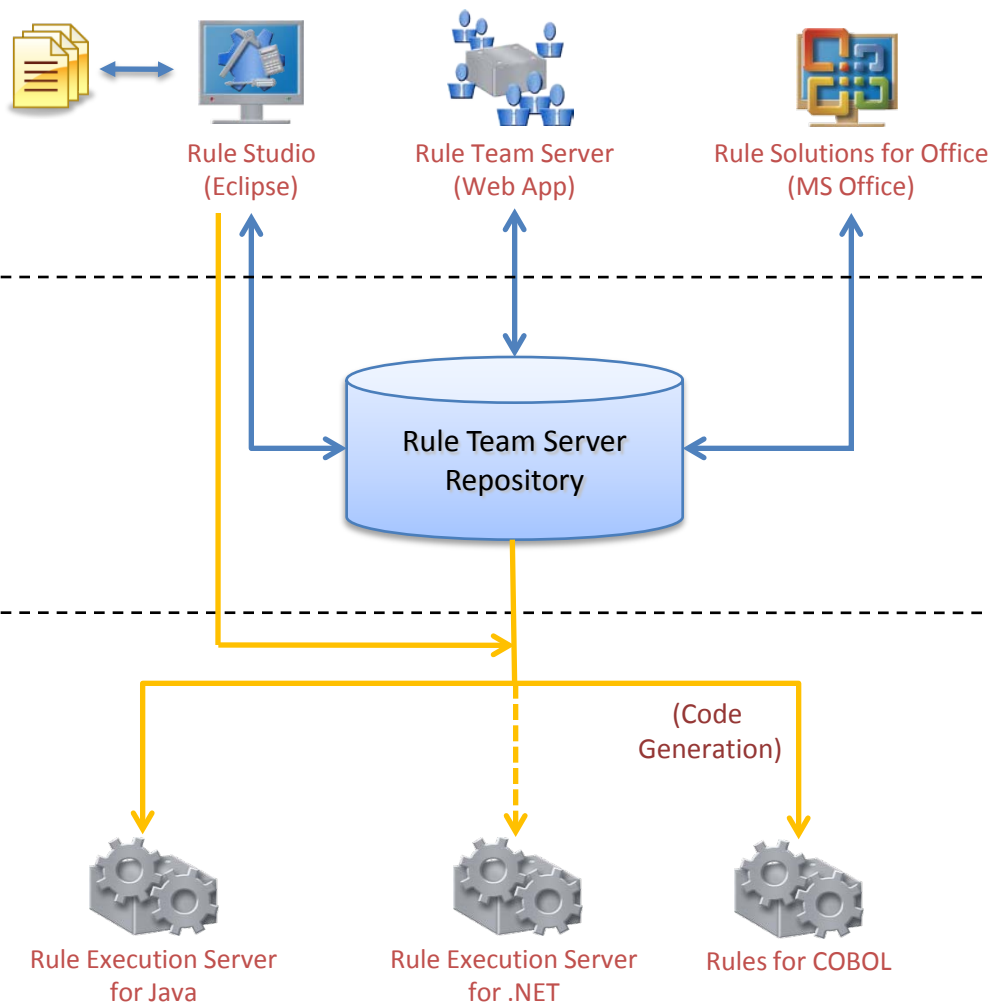
- 跨系统的流程
- 对服务的编排
- 服务来源于各个系统
- 对自动和人工节点的支持

The diagram illustrates the scenario of the business sensitive control point. It shows a central box labeled '业务敏感控制点' (Business Sensitive Control Point) connected to various components. The components include 'Data Center', 'Application Server', 'Database', 'Network', and 'Security'. Arrows indicate the flow of data and control, with a central box labeled '业务敏感控制点' being a key focus.



规则定义一次，到处运行共享

Define once, run everywhere



Rule language technology

- Business vocabulary and syntax
- Multi-locale
- Generic, multi-platform and modular

Rule repository technology

- Robust and secure
- Collaborative
- Governance support: meta-data, permissions, versioning, queries, etc.

Rule execution technology

- Platform-neutral
- Fast
- Standard based
- Fully managed