

Enterprise Architecture

Part 1 Digital Transformation

Part 2 Enterprise Architecture

Part 3 Business Intelligence and Business Analytics

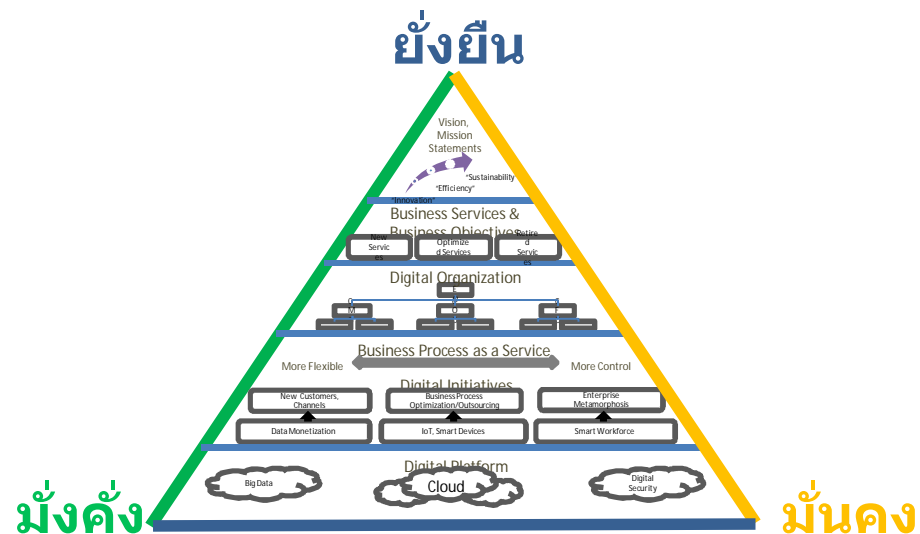
Part 4 People Transformation

อ.दनัยรัฐ ธนบดีธรรมจารี

Line ID: Danairat, FB: Danairat Thanabodithammachari, Tel: +668-1559-1446

August 2016

Part 1



Digital Transformation

The Metamorphosis, Cloud, Big Data, IoT/IoE, Smart Workforce

อ.दनัยรัฐ ธนบดีธรรมจารี

Line ID: Danairat

FB: Danairat Thanabodithammachari

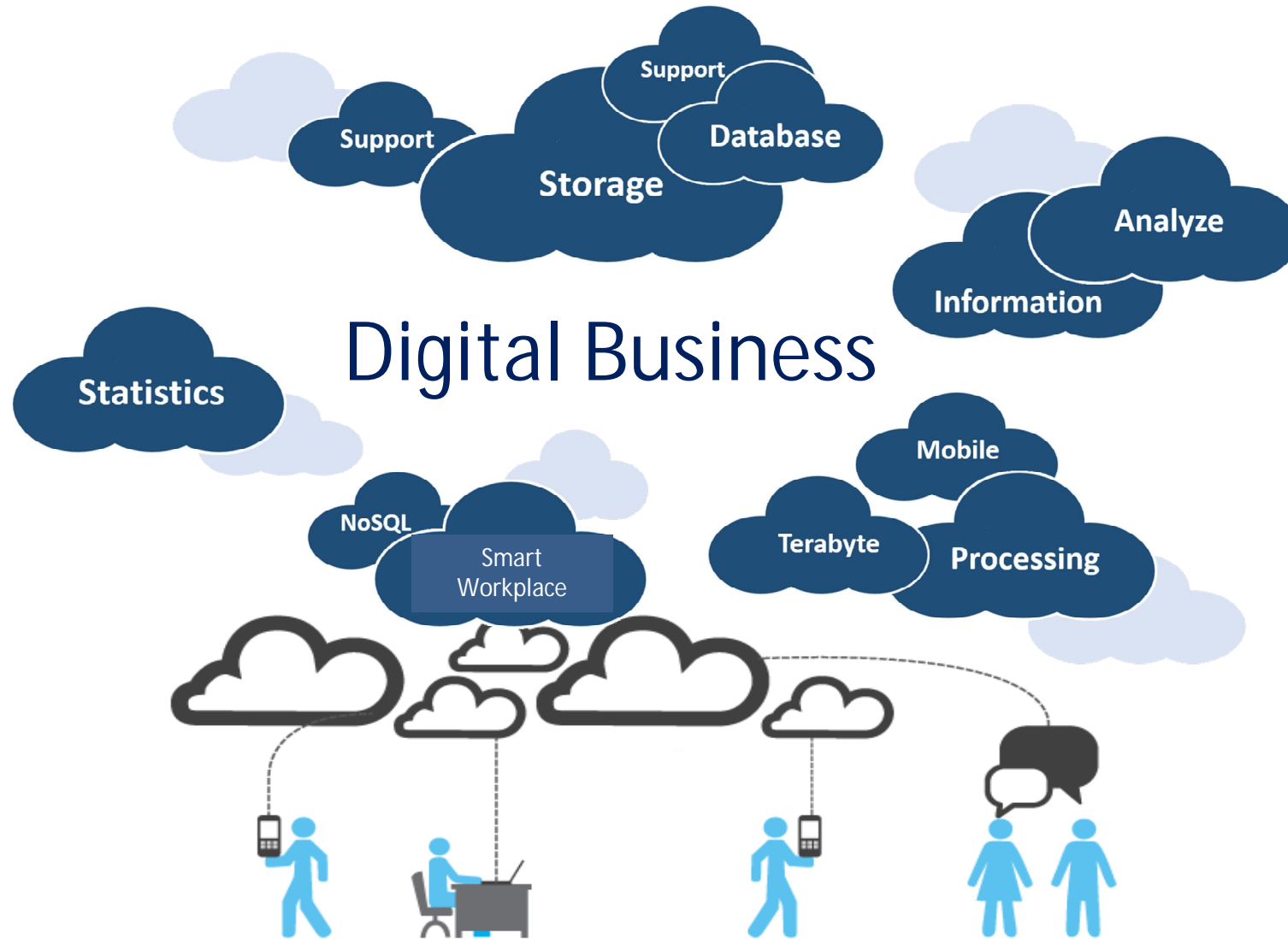
+668-1559-1446

Danairat T.

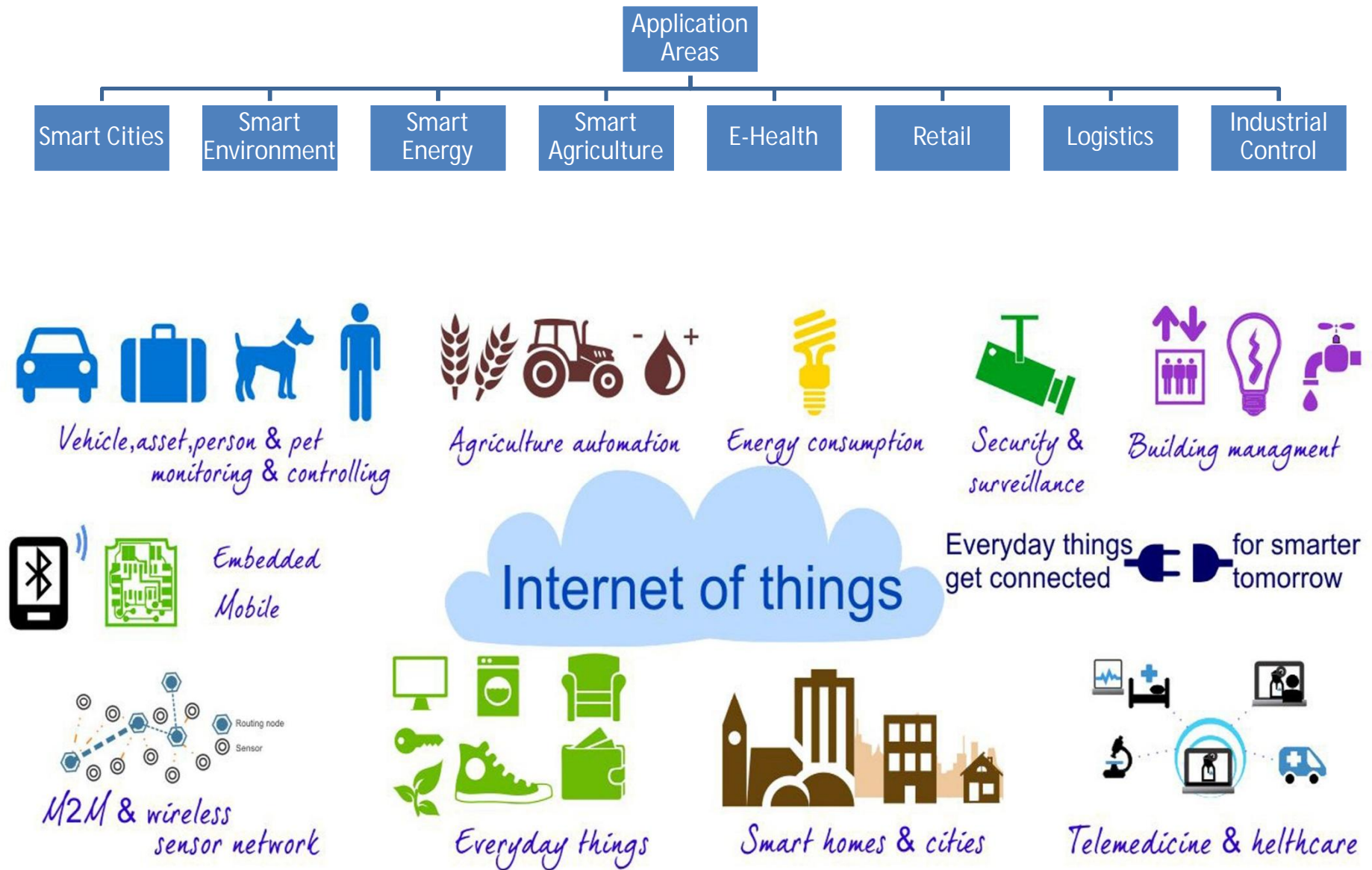
Agenda

- Today Digital Business
- Digital Business Maturity
- Big Data Introduction
- Key Big Data Use Cases
- Digital Transformation Reference Model
- Digital Transformation Domains
- Digital Transformation Worksheet
- Summary

Today Digital Business



Internet of Things

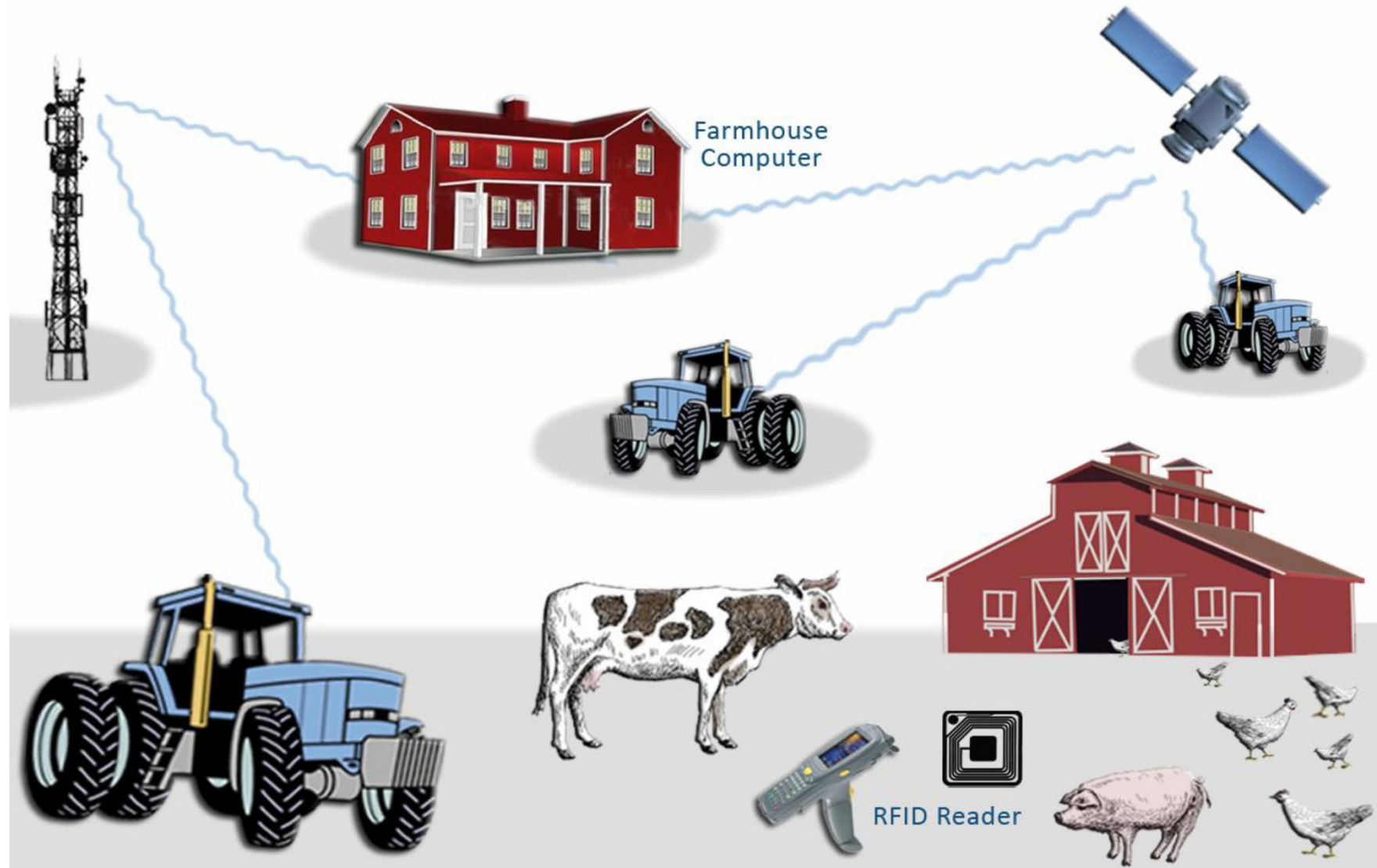


New Digital Touch Points

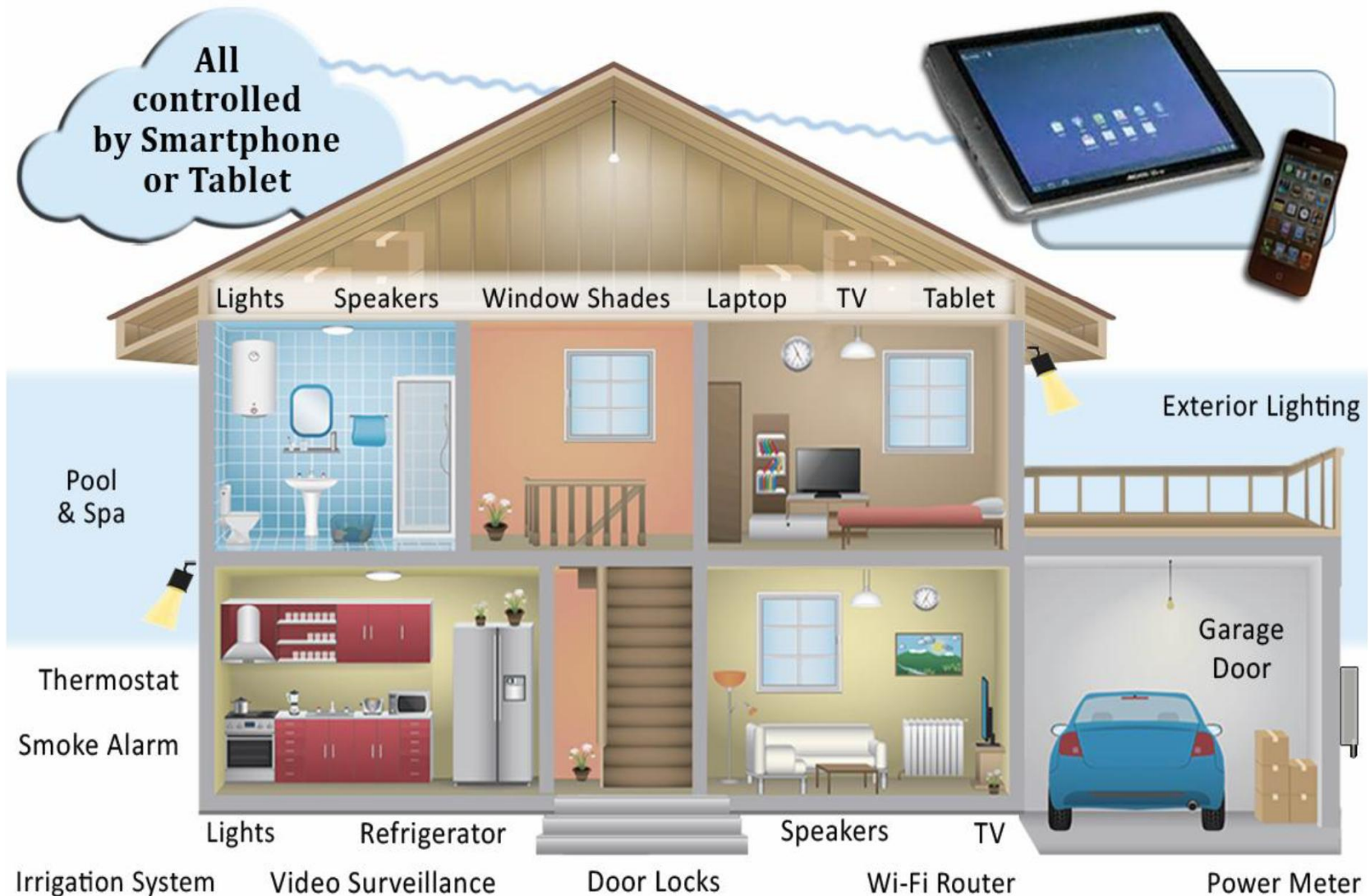
Not only application software



Smart Farming



Smart Home



Self Driving Car



www.google.com/selfdrivingcar/

EV Car



suncountryhighway.com/



Register free for 3 free articles per month, commenting privileges and free updates.

The Nine Elements of Digital Transformation

Opinion & Analysis • January 07, 2014 • Reading Time: 10 min
George Westerman, Didier Bonnet and Andrew McAfee

SUBSCRIBE

In-depth research with executives at managers can use technology to rede

Digital transformation — the use of technology to radically performance or reach of enterprises — is a hot topic for co: the globe. Executives in all industries are using digital adva analytics, mobility, social media and smart embedded devic improving their use of traditional technologies such as ER: customer relationships, internal processes and value propo

<http://sloanreview.mit.edu/article/the-nine-elements-of-digital-transformation/>

Forbes / Tech

MAR 9, 2015 @ 09:09 AM 27,882 VIEWS

5 Things To Do When You Lead A Digital Transformation



Gil Press
CONTRIBUTOR

I write about technology, entrepreneurs and innovation.

[FOLLOW ON FORBES \(289\)](#)



FULL BIO >

Opinions expressed by Forbes Contributors are their own.

<http://www.forbes.com/sites/gilpress/2015/03/09/5-things-to-do-when-you-lead-a-digital-transformation/#1d8021a2624d>

Danairat T.

TWEET THIS



Digital transformation is finding out what data can do for your business



Agile allows everybody to see both the forest and the trees but focus on the trees

Digital transformation is what drives new investments in information technology today and what may finally get the U.S. economy **growing at a faster pace**. But while we hear a lot about digital transformation today, the term is rarely defined. Instead, we typically get a list of the latest digital technologies to impact enterprises—mobile devices, social networks, cloud computing, big data analytics, etc.—and very little guidance regarding how to go about the desired transformation. An exception that proves the rule is Isaac

Publications

 <p>Digital Transformation Review n°8</p> <p>The New Innovation Paradigm for the Digital Age: Faster, Cheaper and Open</p>	 <p>Digital Transformation Review n°7</p> <p>Strategies for the Age of Digital Disruption</p>	 <p>Digital Transformation Review n°6</p> <p>Crafting a Compelling Digital Customer Experience</p>
 <p>Digital Transformation Review n°5</p> <p>Clearing Up for Digital Operations</p>	 <p>Digital Transformation Review n°4</p> <p>Digital Transformation: Accelerating Digital Transformation</p>	 <p>Digital Transformation Review n°3</p> <p>Digital Transformation: making it happen</p>
 <p>Digital Transformation Review n°2</p> <p>The digital economy is triggering a new wave of transformation for organizations and their leaders</p>	 <p>Digital Transformation Review n°1</p> <p>The challenges of the digital revolution</p>	 <p>Your Digital Journey Is Being Mapped by Your Customers</p> <p>MIT-Sloan Management Review</p>
 <p>Embracing Digital Technology: A New Strategic Imperative</p> <p>MIT-Sloan Management Review Research Report</p>	 <p>The Digital Advantage</p> <p>How digital leaders outperform their peers in every industry</p>	 <p>Using Digital Tools to Unlock HR's True Potential</p> <p>Unleashing Digital in HR</p>

Digital affects core businesses, opens new frontiers, and requires foundational change.

New frontiers	Emerging themes		
	Connected cars and autonomous driving	Industry 4.0	E-government and e-education
Core	Smart grid, digital utilities, and smart home	Digital patient and e-health	Digital consumer journey
	Digital logistics	Financial technology and digital banking	Digital media and entertainment
Foundations	Customer-experience design		Value chain
	Digital front-end processes	Integrated physical and digital experience	Automation of back-end processes
	Multichannel commerce	Customer-life-cycle management	End-to-end digitization
	Digital marketing and social media		Outsourcing of support functions
	Technology		Organization and culture
	System and data architecture (2-speed IT)	Big data and advanced analytics	2-speed organization
	Devices	Data security	Cross-functionality
	Connectivity		Agility
			Flat hierarchies
			Digital talent

McKinsey&Company

<https://www.capgemini-consulting.com/digital-transformation>

Who should lead your digital transformation? The CEO, CIO, CMO,...?

POSTED BY : JO AND DADO OCTOBER 29TH, 2014 LEAVE A COMMENT IN ARTICLES 👁 11740 VIEWS

The logo for Harvard Business Review, featuring the text "Harvard Business Review" in white on a red square background.

Last month, **Harvard Business Review** published an article on why we need better managers to deal with Digital Transformation. In their post they mentioned several of the aspects that the digital leadership in your company needs to excel at:

- **Creating a transformative vision** of how your firm will be different in the digital world.
- **Engaging employees** in making the vision a reality.
- Channeling an organization's energy through **digital governance**.
- **Breaking down silos** at the leadership level to drive digital transformation together.

<http://www.digitaltransformationbook.com/tag/harvard-business-review/>

Digital Strategy vs. Digital Transformation

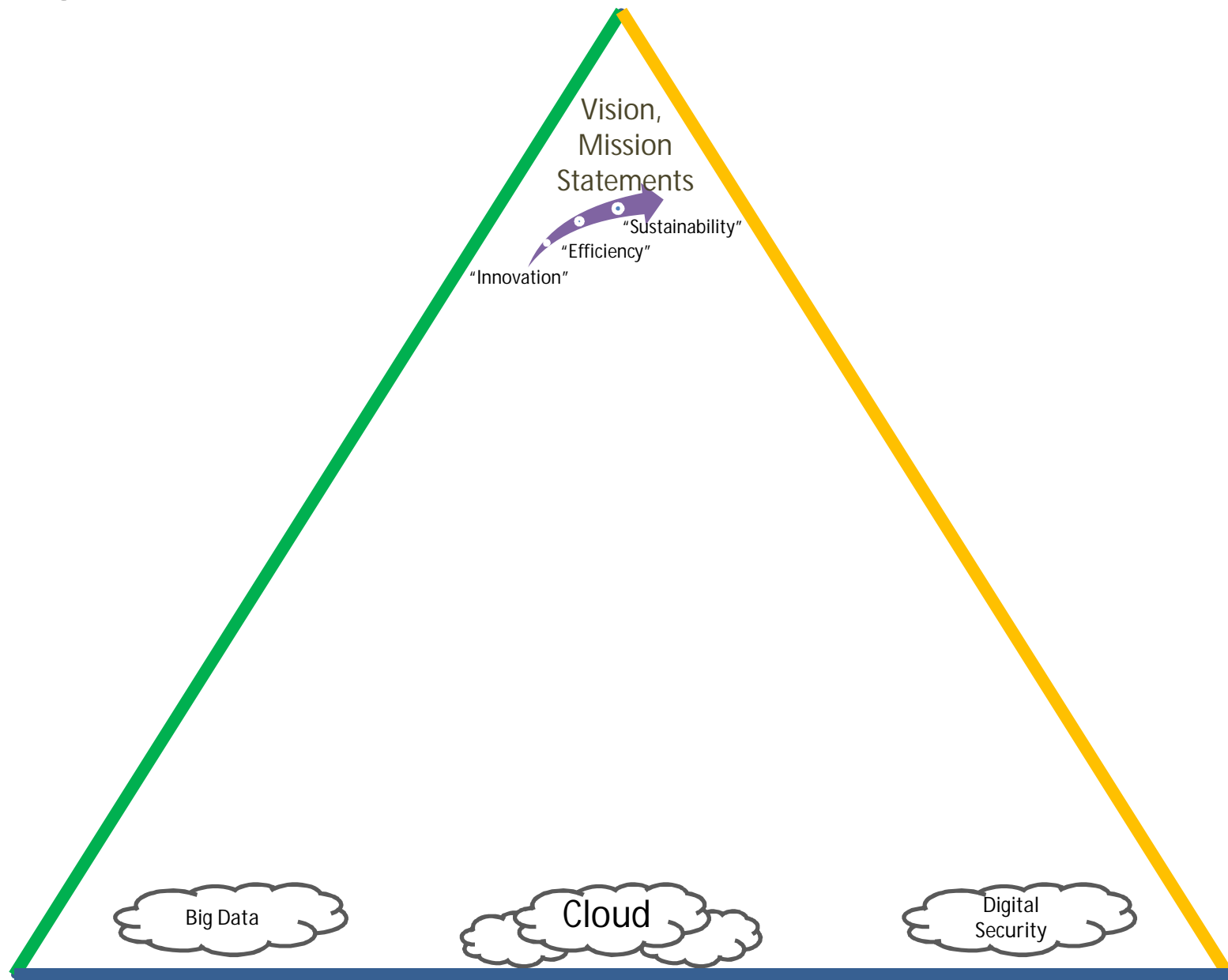
Digital Strategy	Digital Transformation
Project or Program Level	Enterprise Wide Level
Quick Term Win	Medium to Long Term Win
Bottom-up or Top-Down approach	Top-down approach
Technology Leads The Changes	Process or Culture Leads The Changes
Serve the needs of one particular business group	Serve the needs of an enterprise or inter-enterprise
Eg. Create Digital Channel and Social Analytic for Marketing Business Unit, Image processing for Production Business Unit	Eg. Re-define company mission, transforming organization and revise business processes with related policies and adopt new technologies into cross-function business units
Related Technologies: Cloud Computing, Big Data, Smart Devices (Mobile, IoT/IoE, 3D Printing, etc.), Social Network/AI Technology, Cyber-physical system (CPS), Advanced System Architectures and Securities	

Digital Transformation

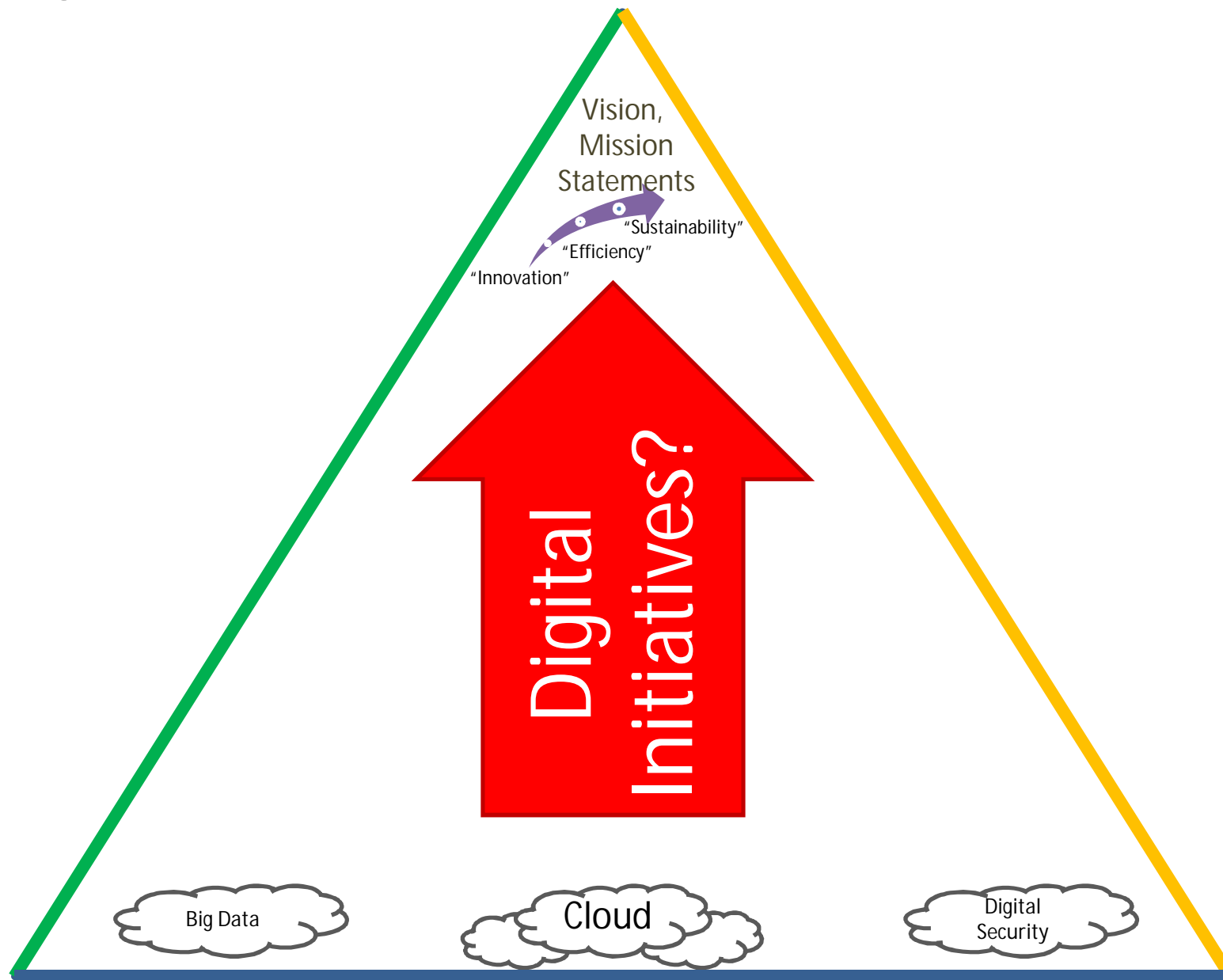


Digital transformation is the process of transforming an **vision, missions, services**, organizations, digital initiatives with business processes and **technologies** to the organization.

Digital Transformation Reference Model



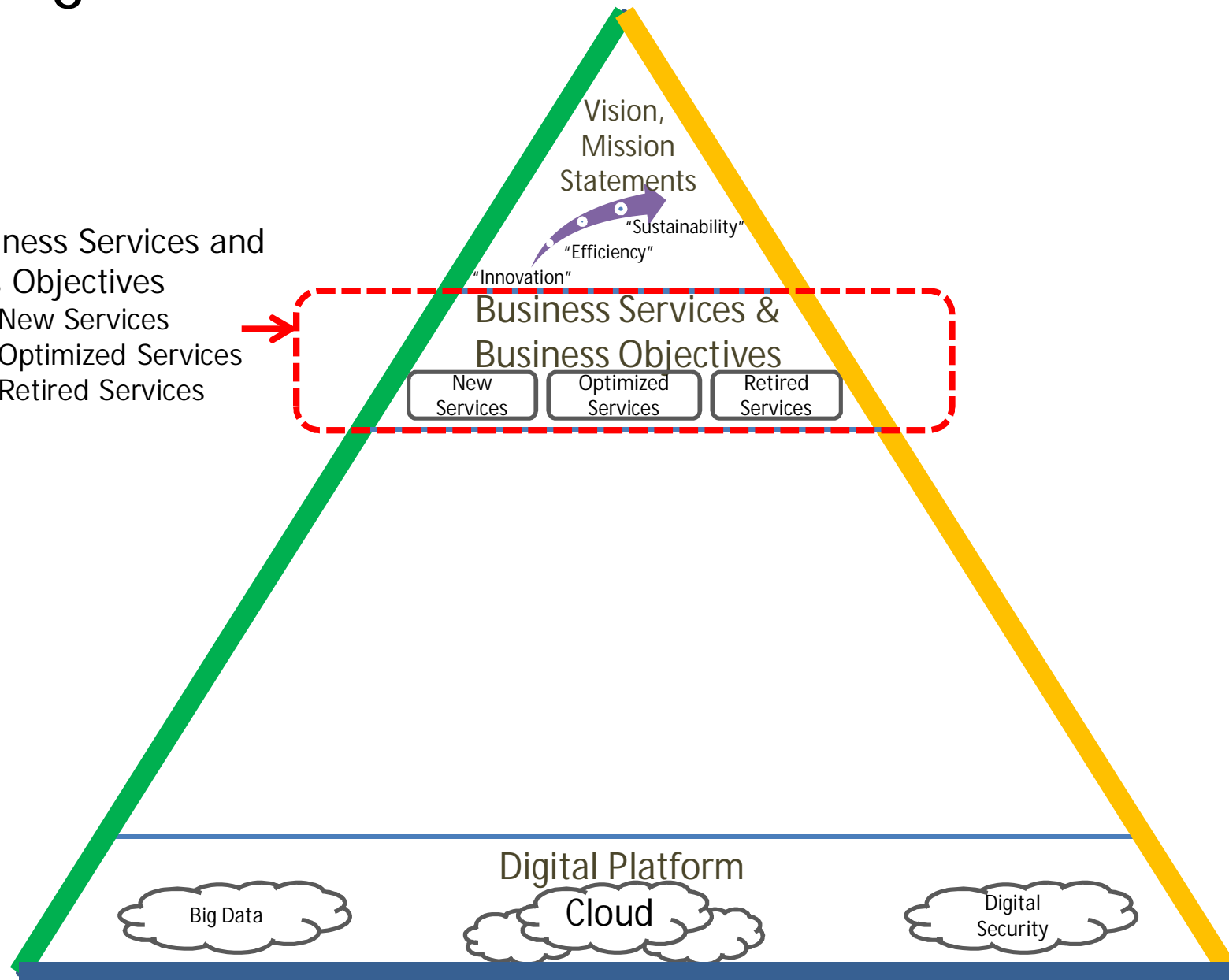
Digital Transformation Reference Model



Digital Transformation Reference Model

The Business Services and Business Objectives

- New Services
- Optimized Services
- Retired Services



Business Services and Business Objectives

The Brainstorm Workshop

New
Services

Optimized
Services

Retired
Services

New
Services

- Client: _____, Service Name: _____, Objective: _____, Released Date: _____

New
Services

- Client: _____, Service Name: _____, Objective: _____, Released Date: _____

New
Services

- Client: _____, Service Name: _____, Objective: _____, Released Date: _____

Optimized
Services

- Client: _____, Service Name: _____, Objective: _____, Released Date: _____

Optimized
Services

- Client: _____, Service Name: _____, Objective: _____, Released Date: _____

Retired
Services

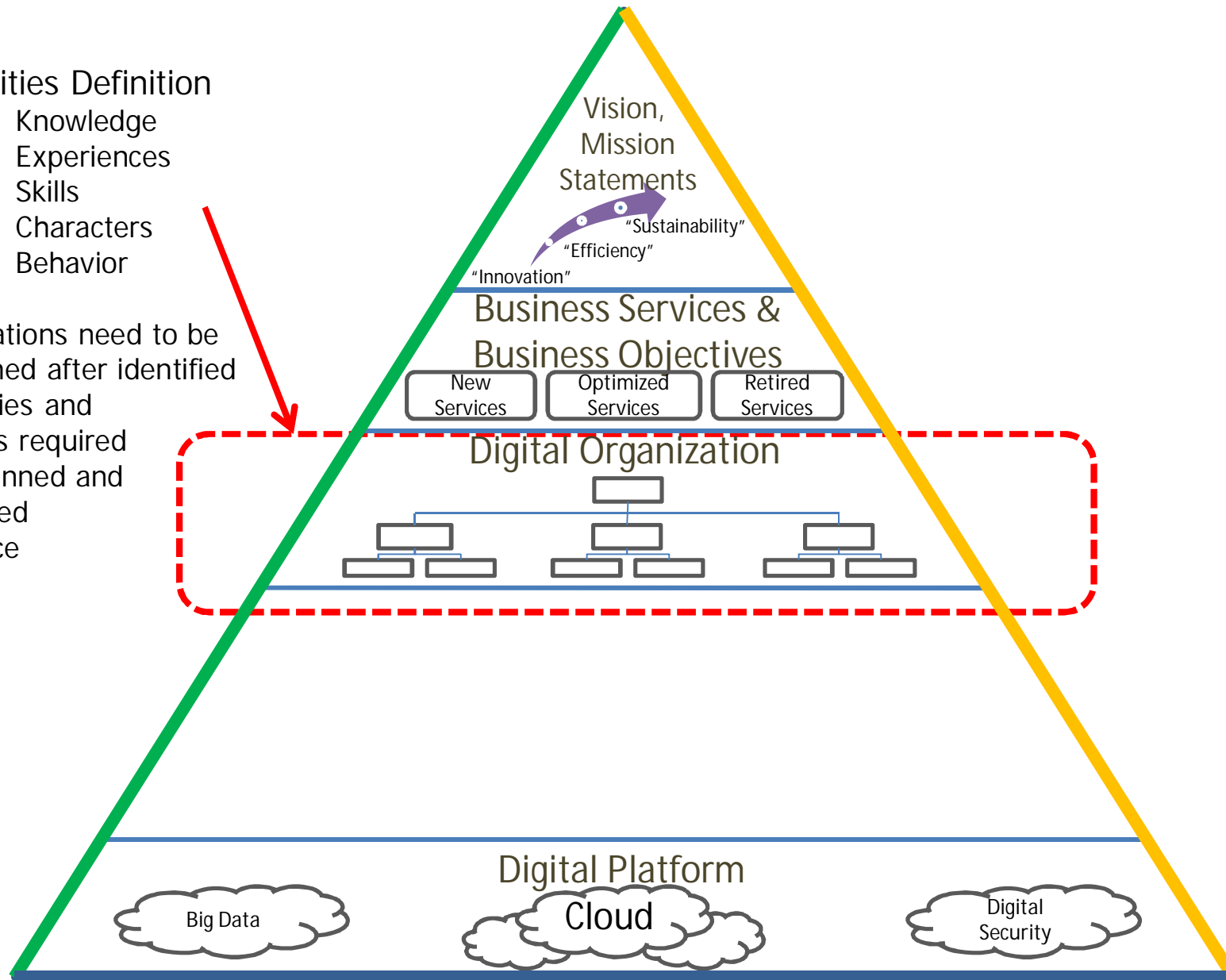
- Client: _____, Service Name: _____, Objective: _____, Released Date: _____

Digital Transformation Reference Model

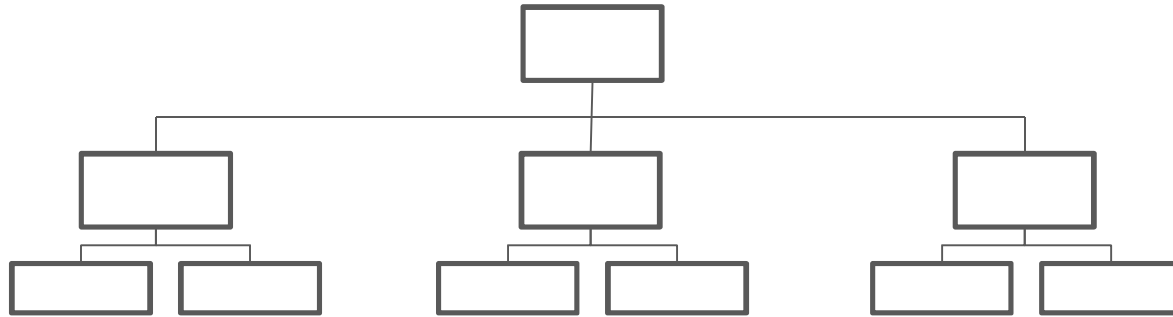
Capabilities Definition

- Knowledge
- Experiences
- Skills
- Characters
- Behavior

Organizations need to be established after identified capabilities and functions required from manned and unmanned workforce

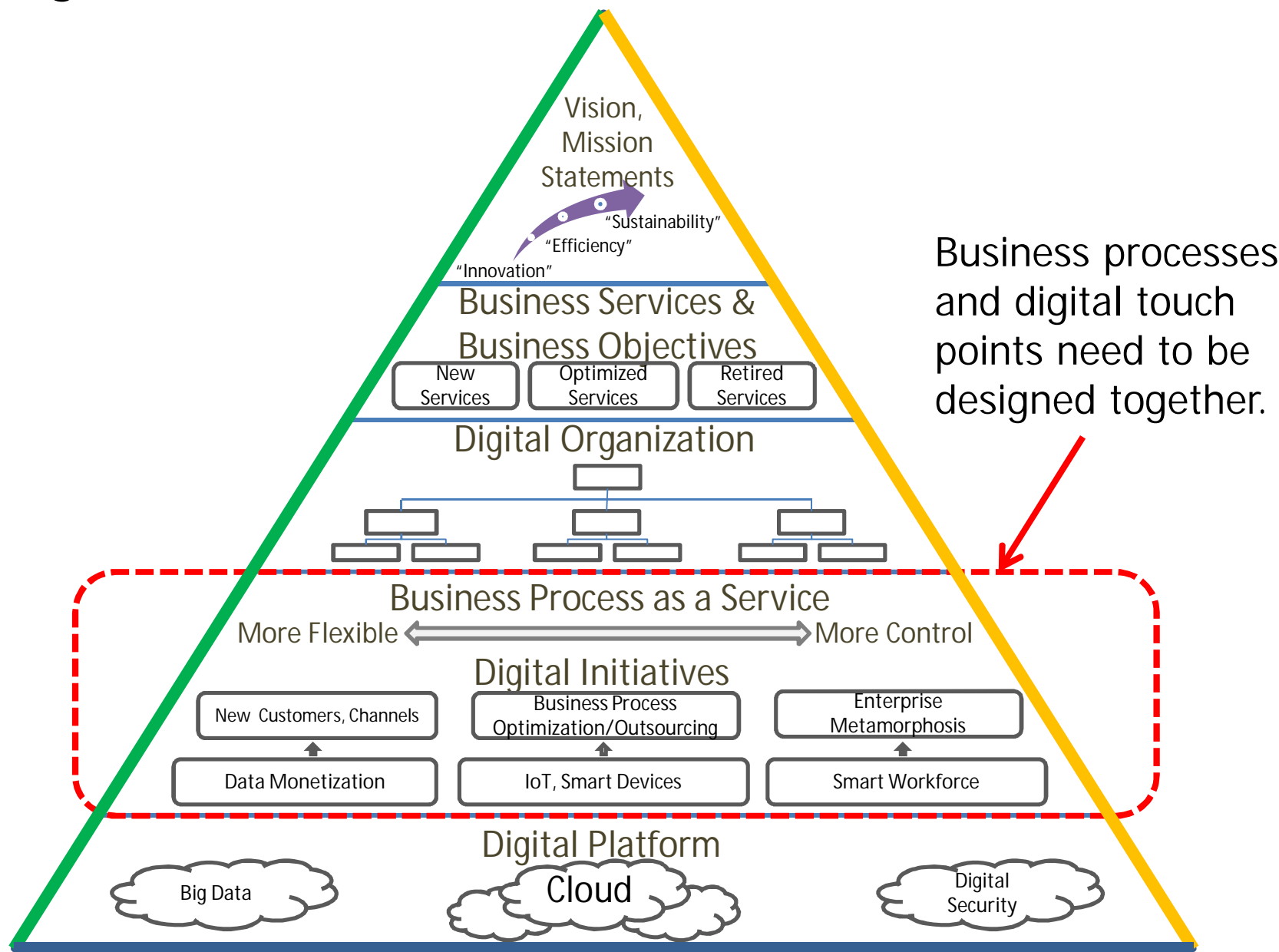


Digital Organization

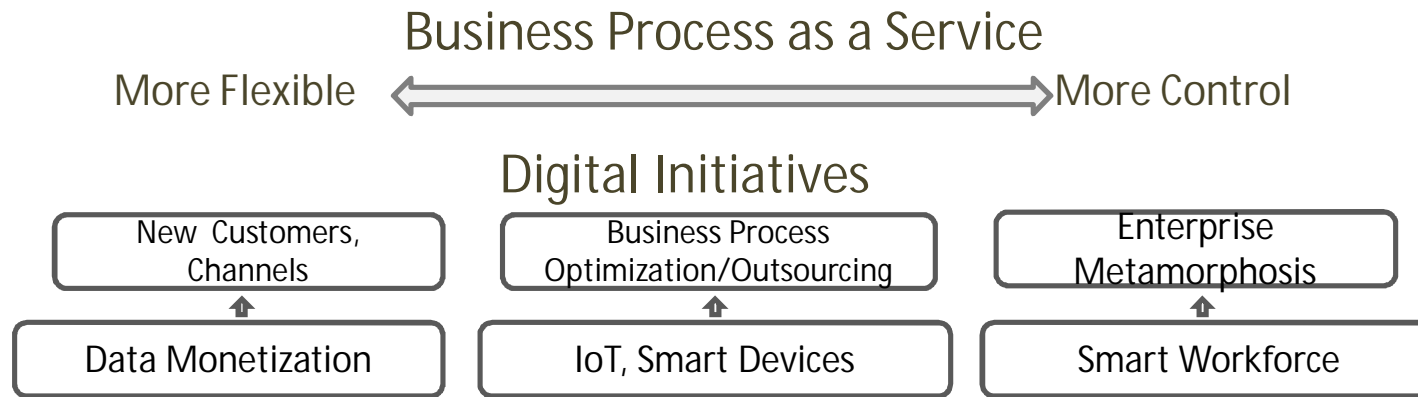


- Start paperless organization in some process
- Always online
- Fellowship vs. Employee
- **Machines and Decision engines**
- **Unmanned Staffs**

Digital Transformation Reference Model

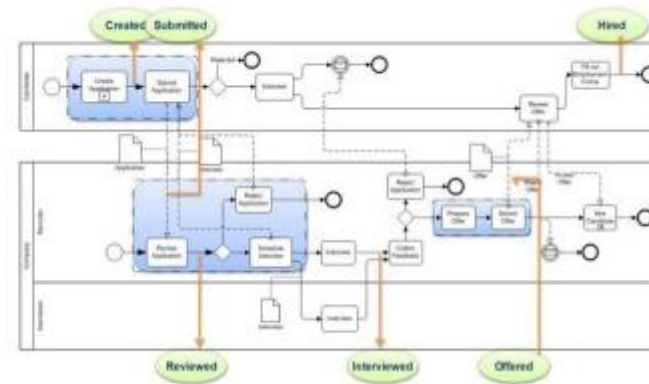
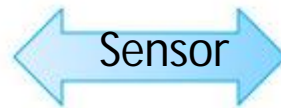


BPaaS and Digital Initiatives



- Business Process for customers need to be more flexible
- Business Process for operation need to be more automation
- Business Process for back office (HR, payroll, finance) need to be more control
- Digital initiatives and Business process in “To Be” state
- Enterprise Metamorphosis will redefine a new vision

Business Process, IoT and Social Integration



- Enrich citizen profile
- Improve citizen relationship
- Improve business rules and approval conditions
- Enhance operational transparency

Business Service Analysis Worksheet

Service Name: _____

Service Owner: _____

Version: _____

Date/Time: _____

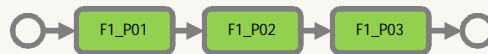
Key Objectives: 1. _____

2. _____

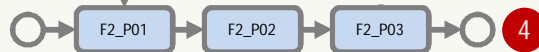
3. _____

4. _____

Business
Function1



Business
Function2



Business
Function3



Business Check Points, Information

1. _____, _____

2. _____, _____

3. _____, _____

4. _____, _____

5. _____, _____

Key Business Issues: _____

Key Technology Issues: _____

Enterprise Repository

Owner: Business Units

Business Objectives Worksheet

Version: ____ Date: ____

#	Business Goals	Business Services	Business Objectives	Owner	Business Processes	Remarks

Business Processes Worksheet

Version: ____ Date: ____

#	Business Process Name	Owner	Strategic Business Process (Y/N)	Main Service Description	High Level Business Process (Please attach up-to-date document)	Expected Transaction Complete Duration (hr,day,week)	Actual Transaction Complete Duration (hr,day,week)	Total of Transaction / (hr, day, month)	% of Transaction Duration done by automated system	Supported by Application(s)	Current Issues	Remarks

Enterprise Repository

Owner: Technology Unit

Applications/Touch Points Worksheet

Version: ____ Date: _____

#	Applications / Touch Points Name	Owner	Activity Flow (please attach up-to-date document)	Integration to which systems (online/batch)	Major Data Required	Current Issues	Remarks

Owner: Business Unit with supported by Technology Unit

Data Worksheet

Version: ____ Date: _____

#	Data Name	Owner	Description	Change Control of data (Y/N)	Structure/ Unstructure	Data Type (DB, JSON, XML, Sound, Image, VDO, etc.)	Current Issues	Ramarks

Enterprise Repository

Owner: Technology Units

Technology Worksheet

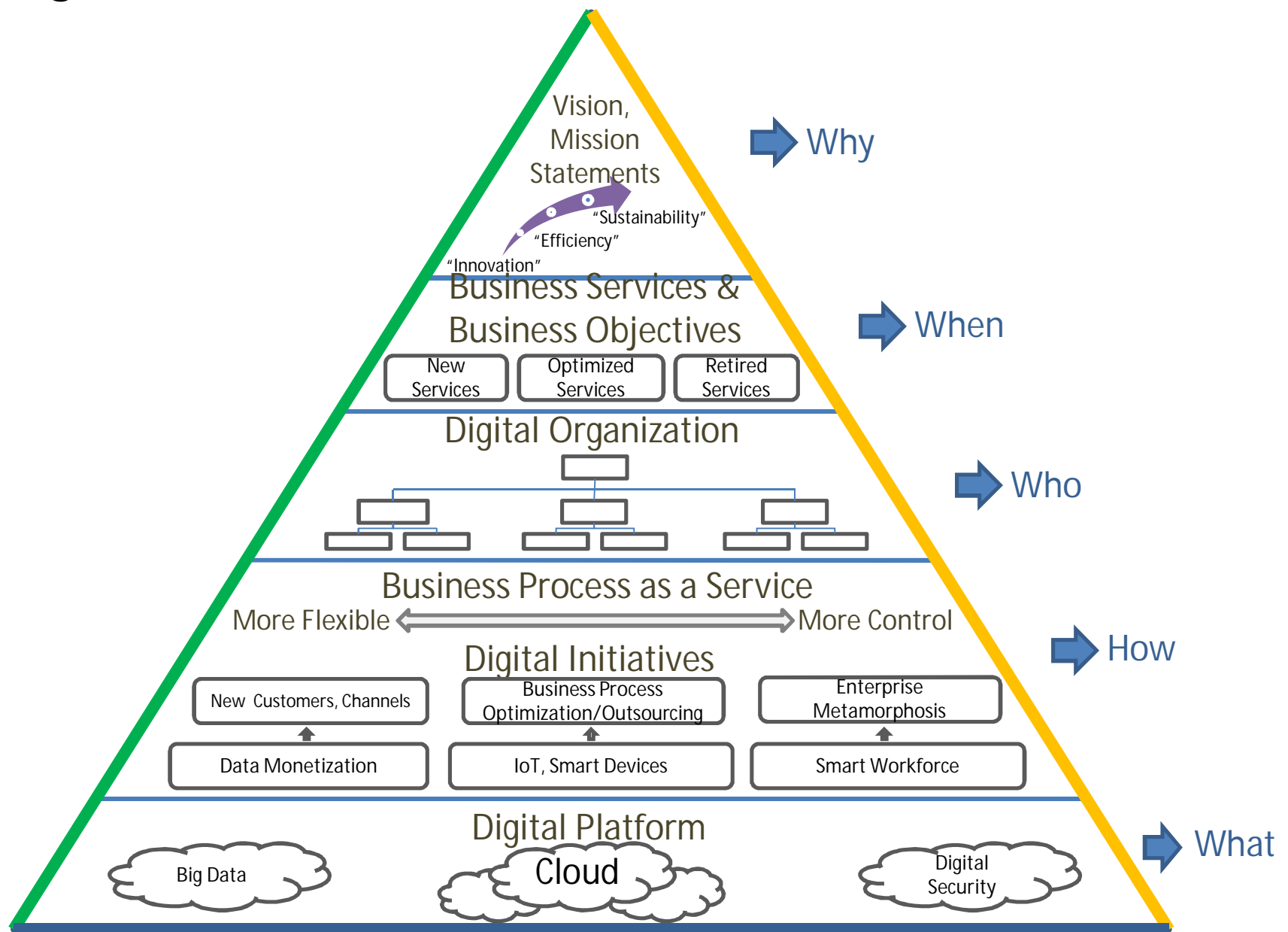
Version: ____ Date: _____

#	Applications / Touch Points / Database / Data Store Name	Total Connections	Concurrent Connections	Required Response Time (sec.)	Actual Response Time (sec.)	Development Software Languages / Framework (for App)	Package / In-House (for App)	Private / Public / Hybrid Cloud	OS / Platform (Windows, Linux, Docker, etc.)	Monitoring Tool Name	Sign On / Security System Name	% growth / year	Initial Cost (Baht)	M.A. Cost /year (Baht)	Remarks

- #
- Applications / Touch Points / Database / Data Store Name
- Total Connections
- Concurrent Connections
- Required Response Time (sec.)
- Actual Response Time (sec.)
- Development Software Languages / Framework (for App)
- Package / In-House (for App)

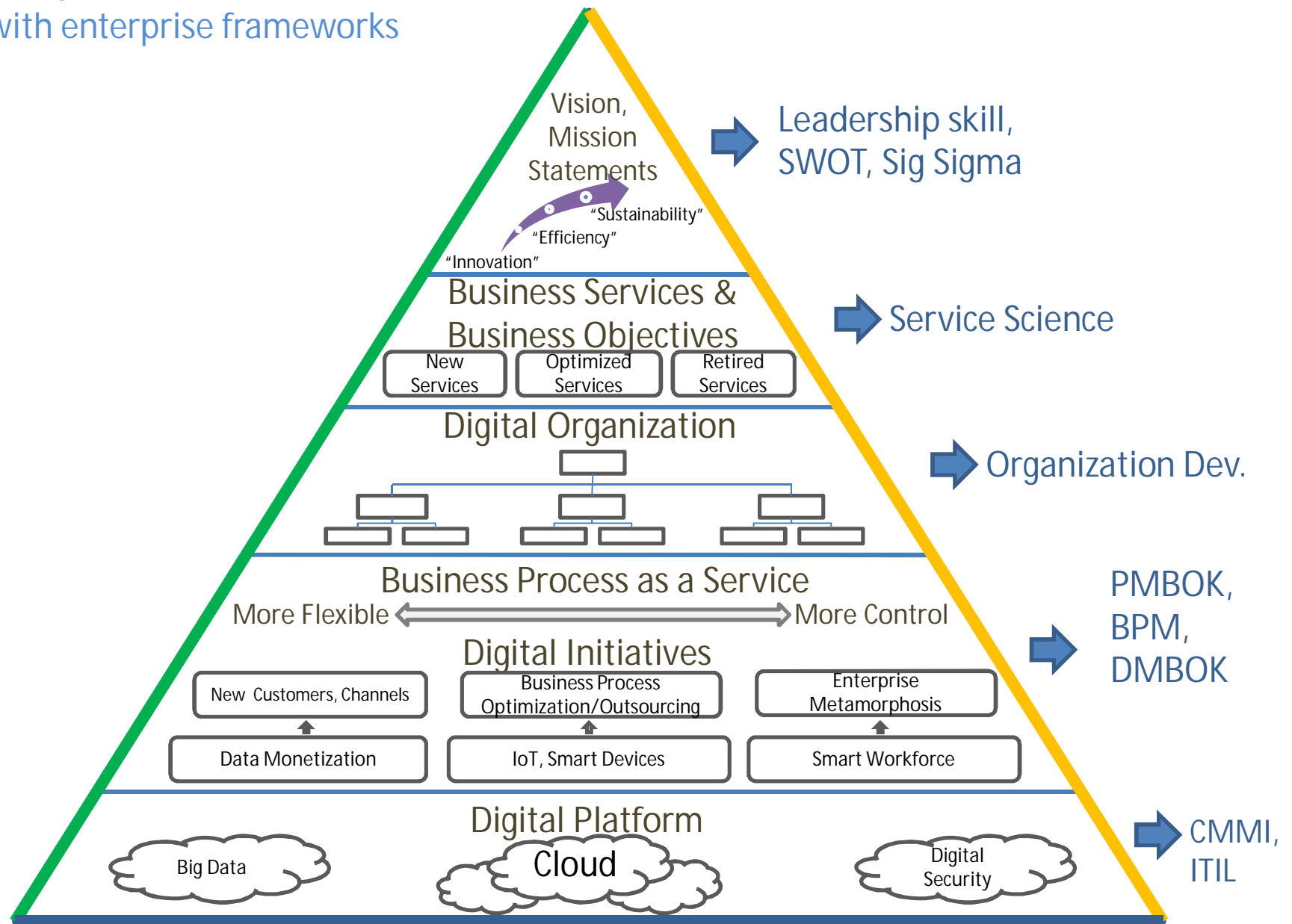
- Private / Public / Hybrid Cloud
- OS / Platform (Windows, Linux, Docker, etc.)
- Monitoring Tool Name
- Sign On / Security System Name
- % growth / year
- Initial Cost(Baht)
- M.A. Cost /year (Baht)
- Remarks

Digital Transformation Reference Model

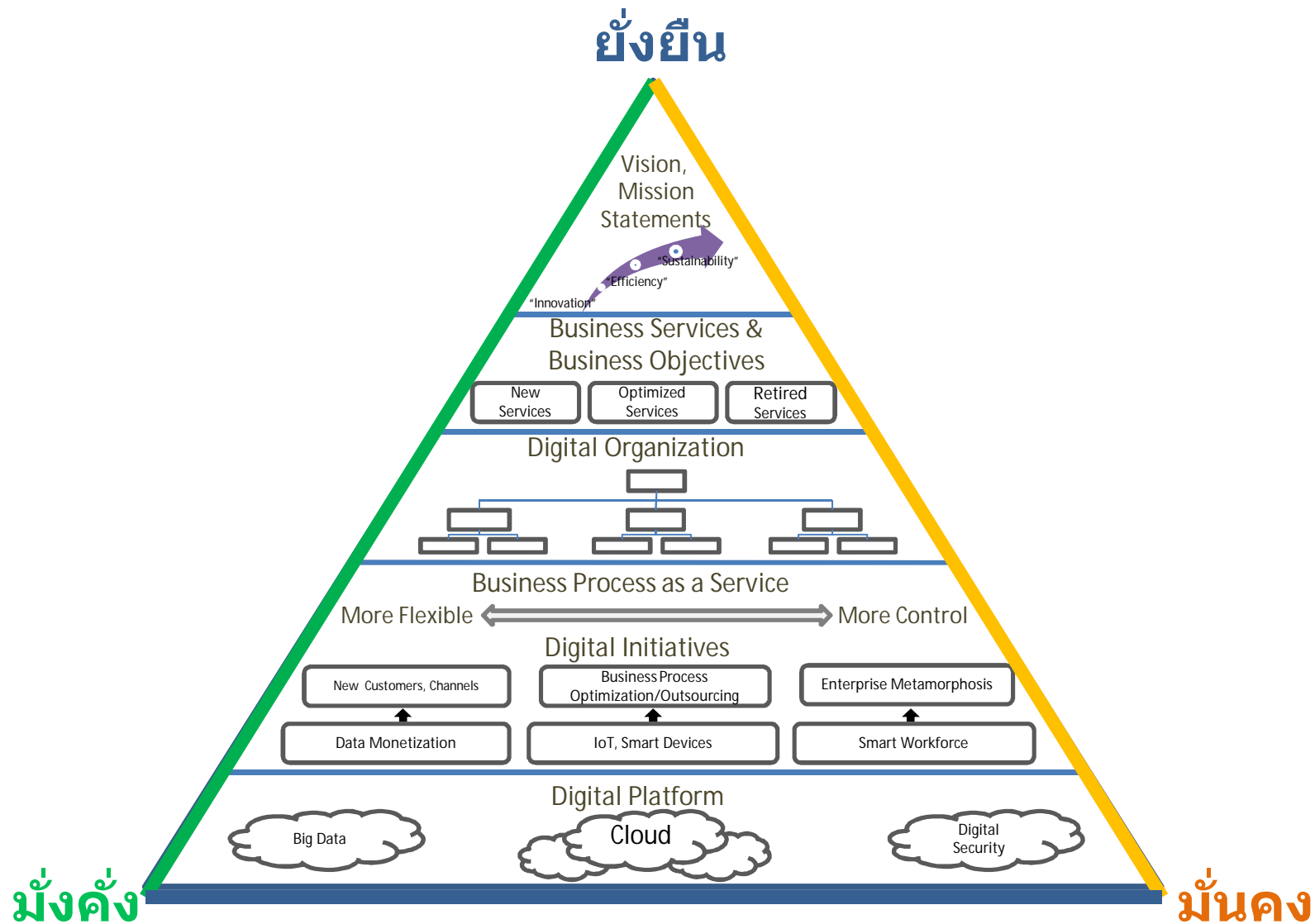


Digital Transformation Reference Model

with enterprise frameworks



Digital Transformation Reference Model



Digital Transformation Domains

#	Domain	Increasing of Revenue (มั่งคั่ง)	Resource Optimization (ยั่งยืน)	Reduce Risk (มั่นคง)
1	Finance	Increase Revenue	Create Services Portfolio	Compliance with laws regulations
2	Customer	New Products, Service, Promotion Innovation	Reuse Business Channels	Service Continuity and Availability, Retired Services
3	Internal	Create New Business Process	Eliminate Production Cost	Standardize Change Control, Eliminate unnecessary laws
4	Learning and Growth	Seek more Talent People	Standardize Skill Required	Enterprise Knowledge Repository, Work from home, Smart workplace

Digital Transformation Domains

#	Domain	Increasing of Revenue	Resource Optimization	Reduce Risk
1	Finance			
2	Customer			
3	Internal			
4	Learning and Growth			

Digital Transformation Worksheet

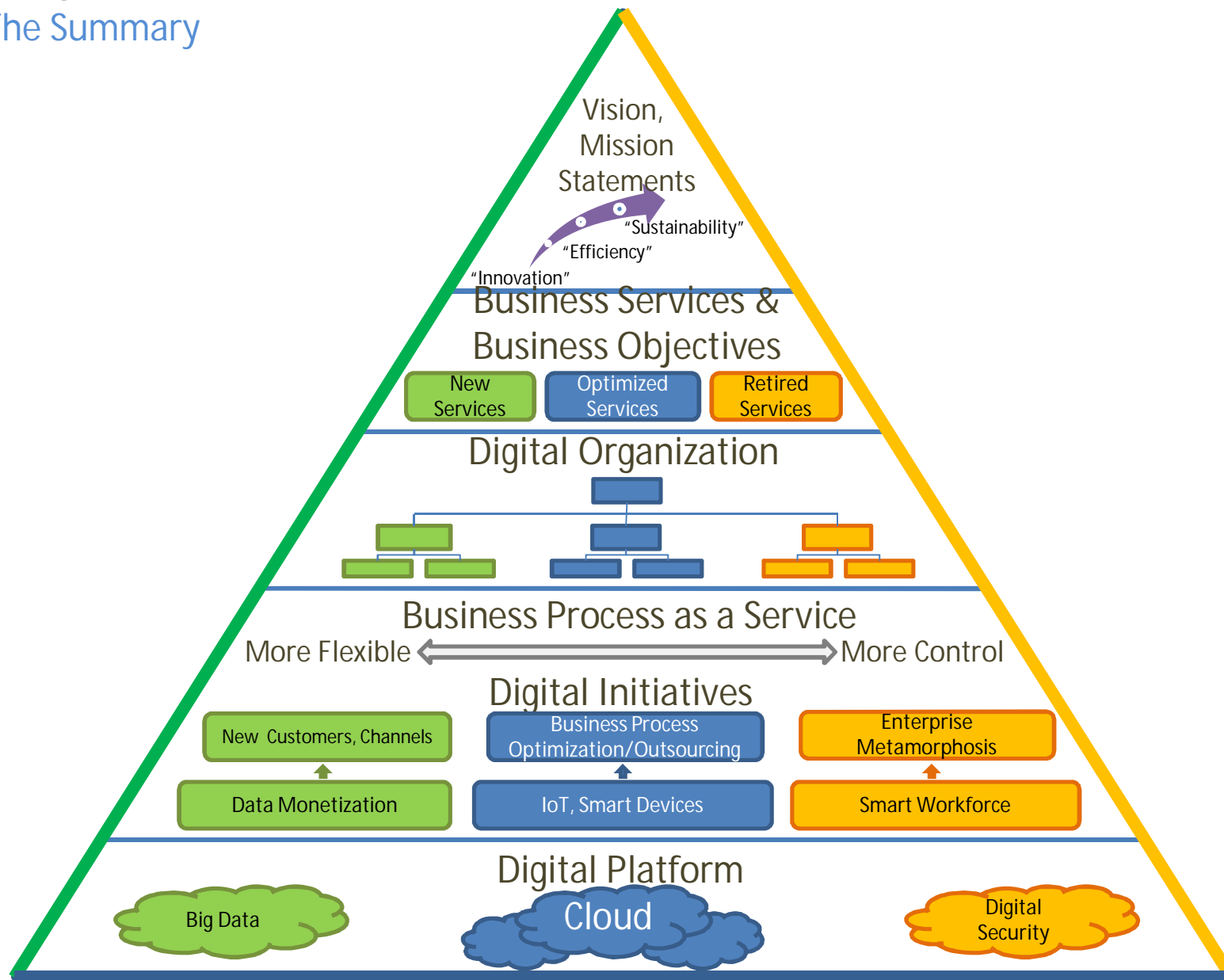
Who (Who care)	What	Service Type	Why (Objectives)	When (to be released)	Digital Data Source

Digital Transformation Master Plan (DX Master Plan)

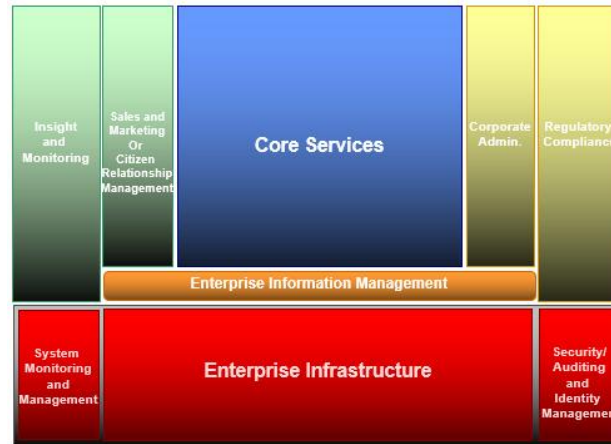
		Standardization & Optimization		Growth					
Initiatives	Projects	2016		2017		2018		2019	
		H1	H2	H1	H2	H1	H2	H1	H2
Executive Intelligence and external integration	Data Interoperability	→	→		→				→
	Information Service for Business Partner	→	→		→				→
Dev Stabilization	DevOps Standards	→	→						→
Business Process Optimization & Application Consolidation	Identify Processes and PMO	→				→			→
	Core Processes Optimization		→	→	→	→	→	→	→
	Applications Consolidation			→	→				→
	Open Data for PPP		→	→	→				→
	Business Intelligence		→	→	→	→	→	→	→
Digital Platform	Cloud, Big Data Platform	→	→						→
	Governance Framework		→	→	→				→
	IoT and Social Integration				→	→	→		→
	Network and Office Automation	→							→

Digital Transformation Reference Model

The Summary



Part 2



Enterprise Architecture for Digital Transformation

อ.ดนัยรัฐ ธนบดีธรรมจารี

Line ID: Danairat

FB: Danairat Thanabodithammachari

+668-1559-1446

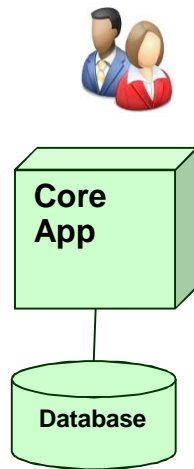
Danairat T.

Agenda

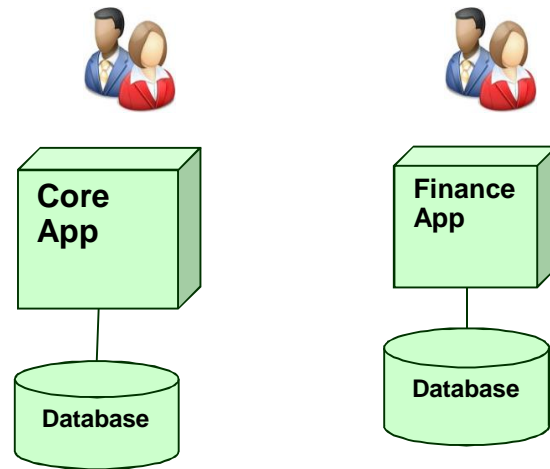
- Why do we need Enterprise Architecture (EA)?
- What is an EA and key benefits?
- EA and ERP Implementation
- Building EA
 - Enterprise Reference model
 - Business Architecture
 - Application Architecture
 - Data Architecture
 - Technology Architecture
 - Key EA Activities
- EA and Digital Transformation Master Plan
- Summary

Why do we need Enterprise Architecture (EA)?

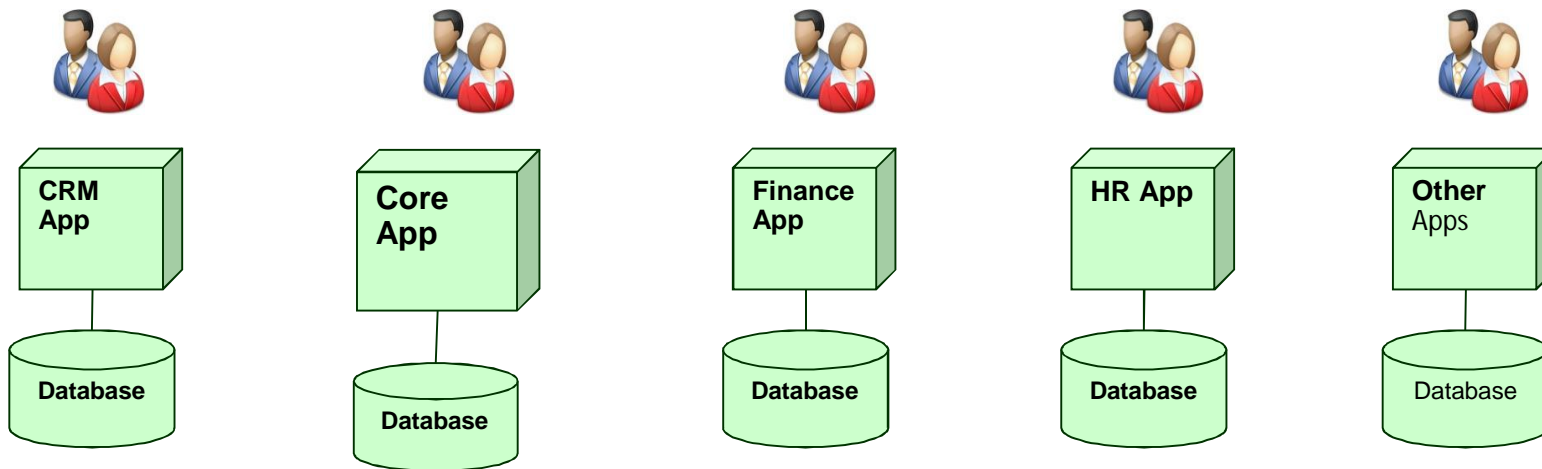
IT Silos



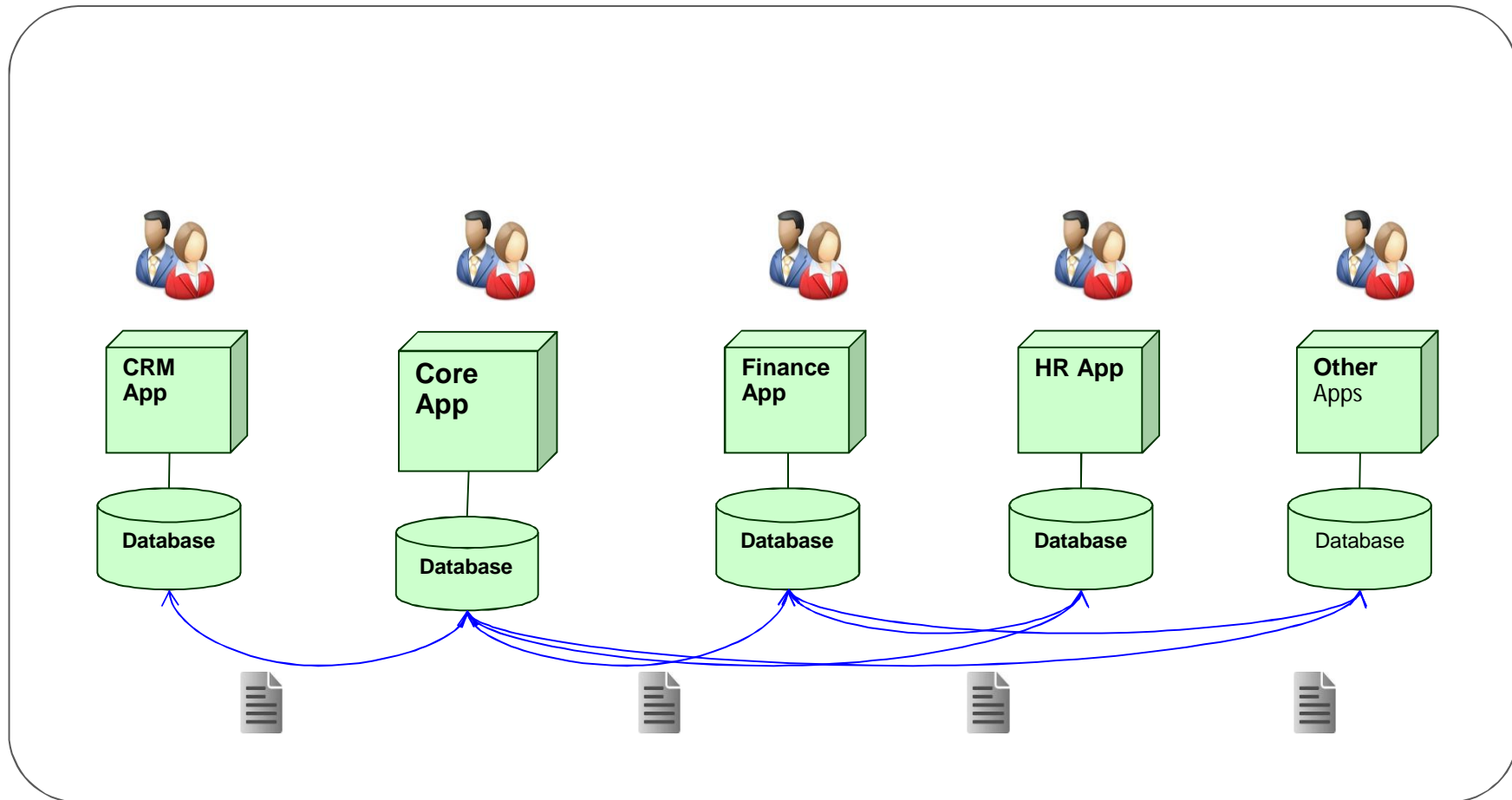
IT Silos



IT Silos

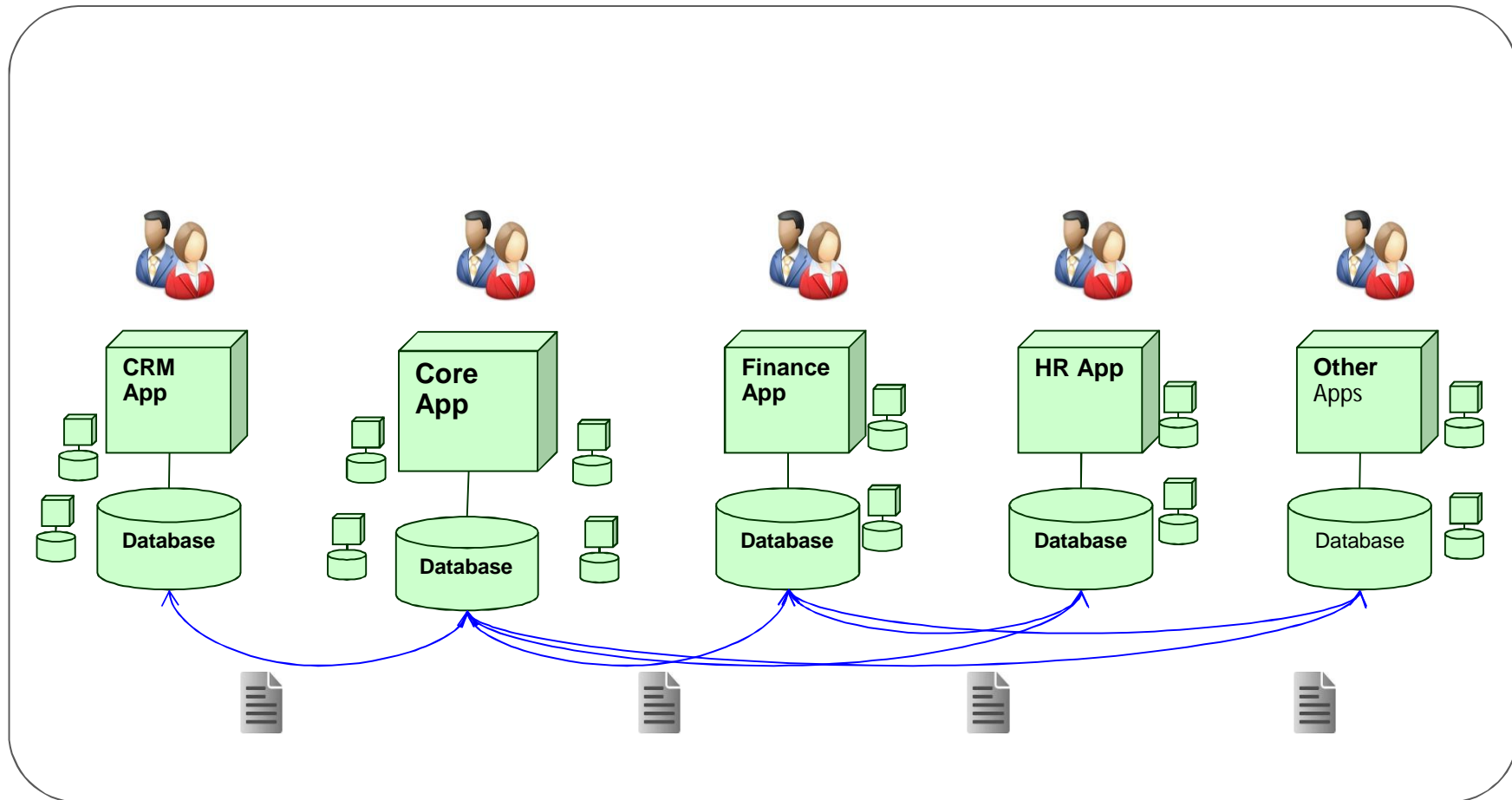


IT Silos



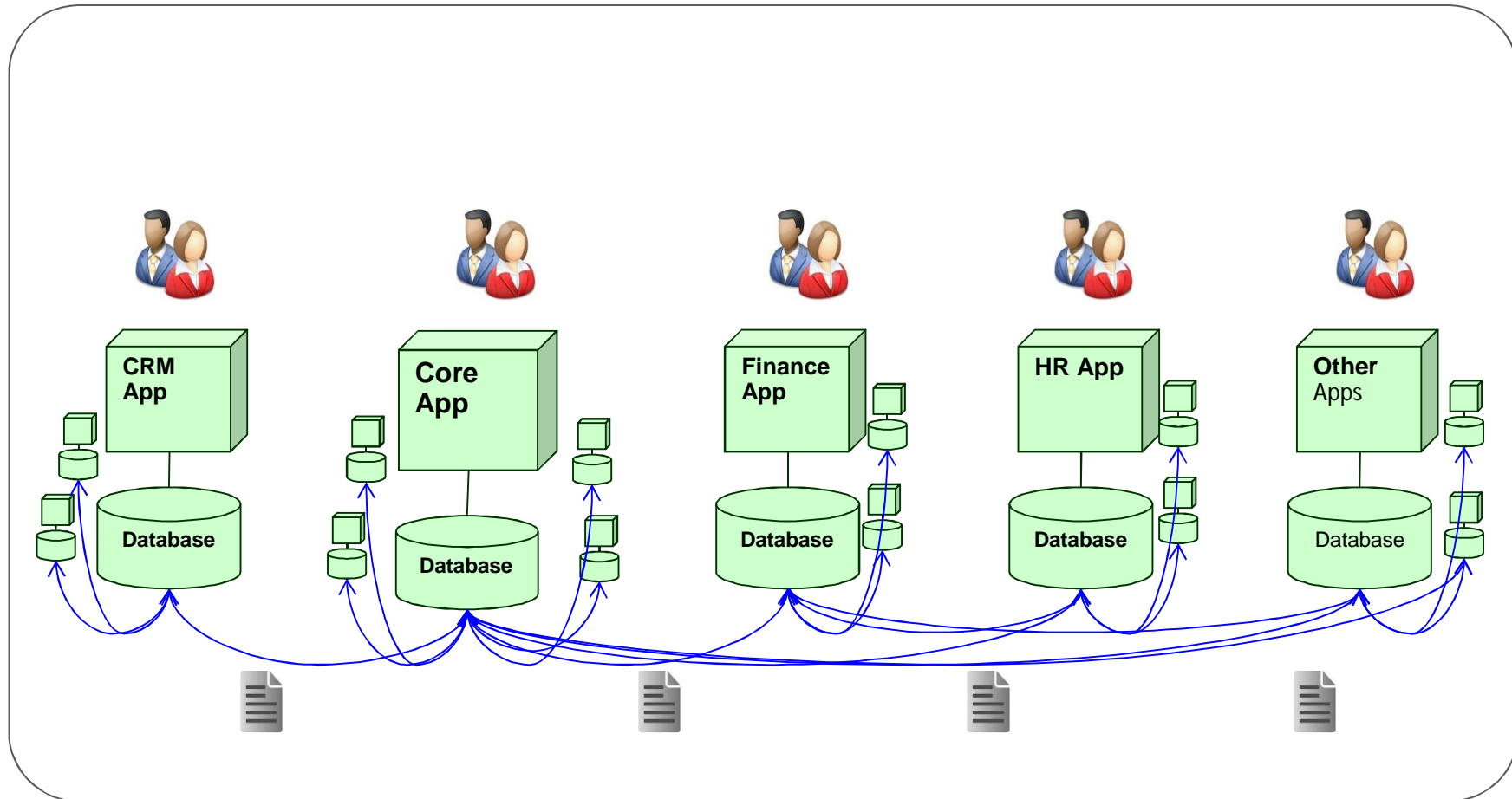
IT Silos make inefficient to scale the business

IT Silos



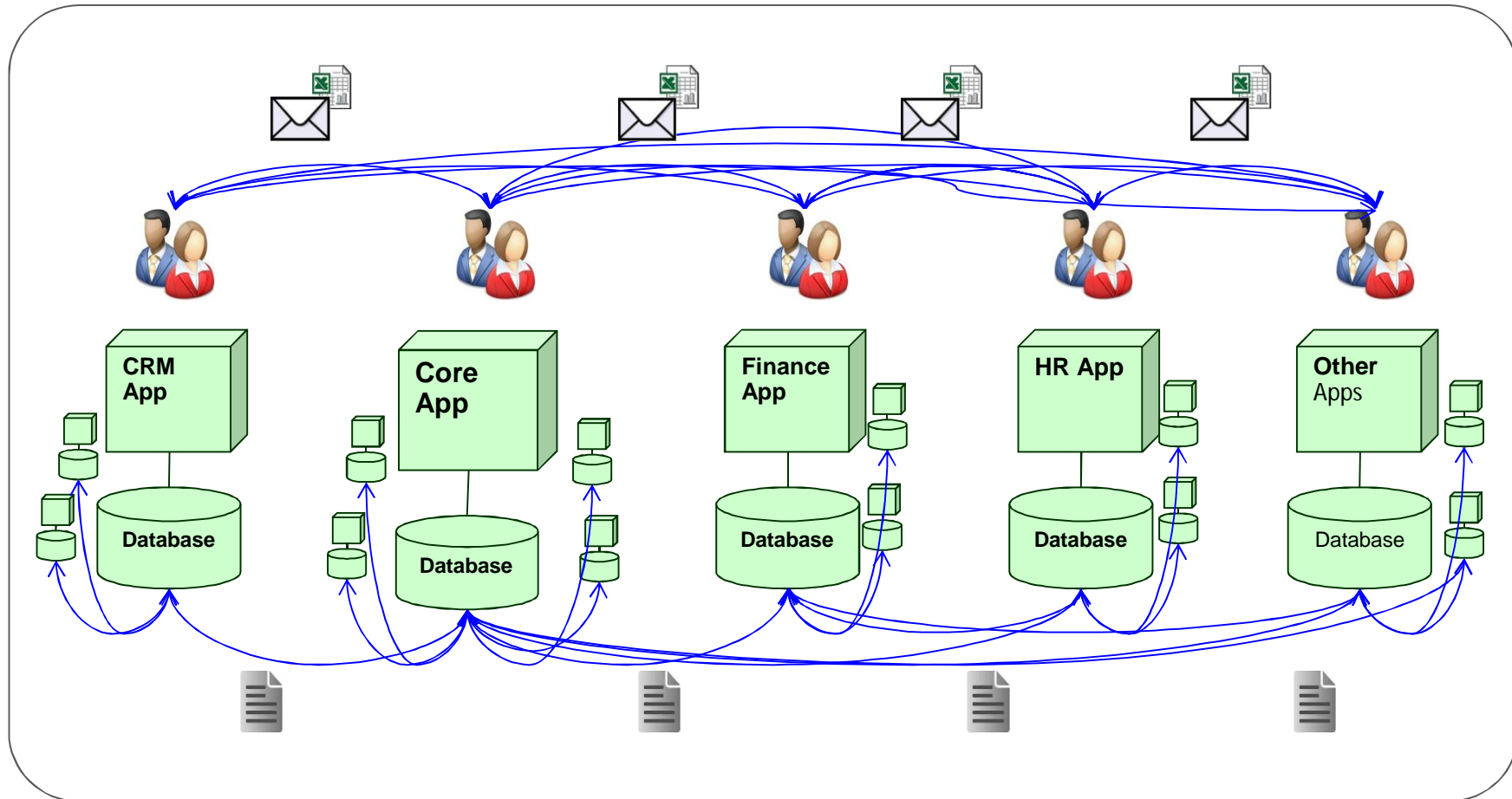
IT Silos make inefficient to scale the business

IT Silos



IT Silos make inefficient to scale the business

IT Silos



IT Silos make inefficient to scale the business

Top Concerns from IT Silos

- แต่ละหน่วยงานในองค์กรให้ข้อมูลที่ไม่ตรงกันแก่ลูกค้า ผู้รับบริการ
- ข้อมูลรายงานผิดพลาดเมื่อต้องใช้ในการตัดสินใจด้าน ธุรกิจ
- มีหลายกระบวนการทำงานที่ซ้ำซ้อนกัน
- ขาดความคล่องตัว และใช้เวลามากเมื่อต้องปรับปรุงเพื่อ รองรับบริการใหม่ๆ
- ต้องใช้ความพยายามอย่างหนักในการทำให้ทุกระบบ ผ่านการตรวจสอบด้าน IT Audit, Regulatory Compliance, หรือ ISO ต่างๆ
- ต้องใช้ทักษะด้าน IT หลากหลายเกินความจำเป็นต่อการดำเนินงานธุรกิจ
- IT เป็น Bottleneck ต่อการขับเคลื่อนธุรกิจ

What is an EA and key benefits?

Enterprise Architecture

What is an Enterprise Architecture?

A structure design to ensure alignment between the business and IT strategies



สถาปัตยกรรมด้าน IT/Digital ให้กับองค์กร เพื่อเป็นโครงสร้างในการต่อยอดธุรกิจได้อย่างยั่งยืน

Enterprise Architecture

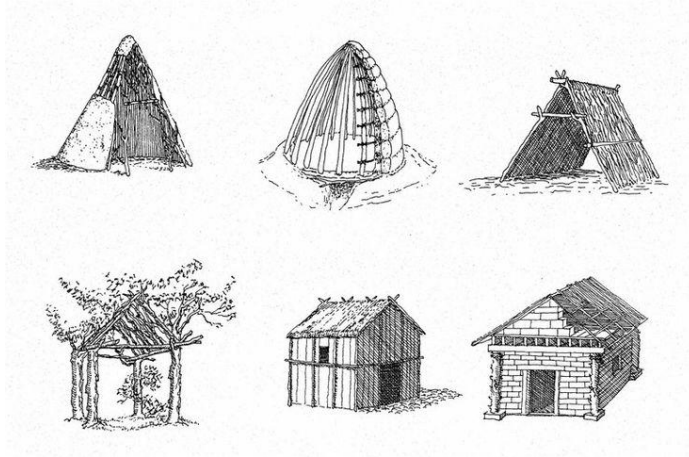
Enterprise Architecture is a structure design to ensure alignment between the business and IT strategies plus operating model, guiding principles.

Enterprise Architect

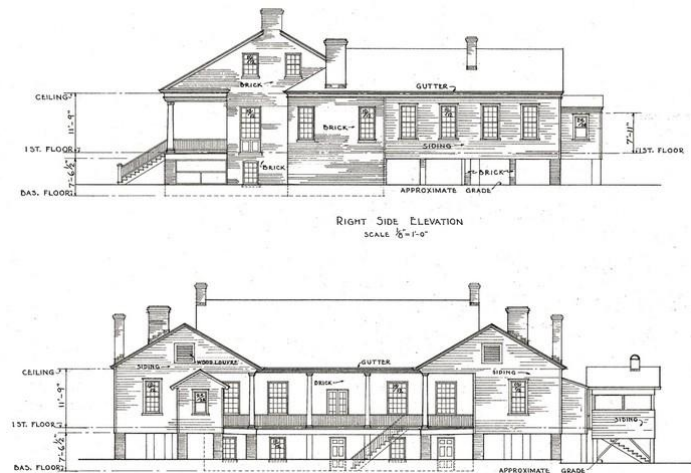
Responsibilities

- Understanding of business needs and technology limitation.
- Facilitate experts to work for enterprise goals
- Promotion of shared infrastructure and applications
- Management of the risks associated with information and IT
- Build staff knowledge and skills in specific areas.
- Involvement in the standards and policy guidelines.

without EA vs. with EA



VS.



Quick build and difficult to scale

Design for scale and maintain

without EA vs. with EA



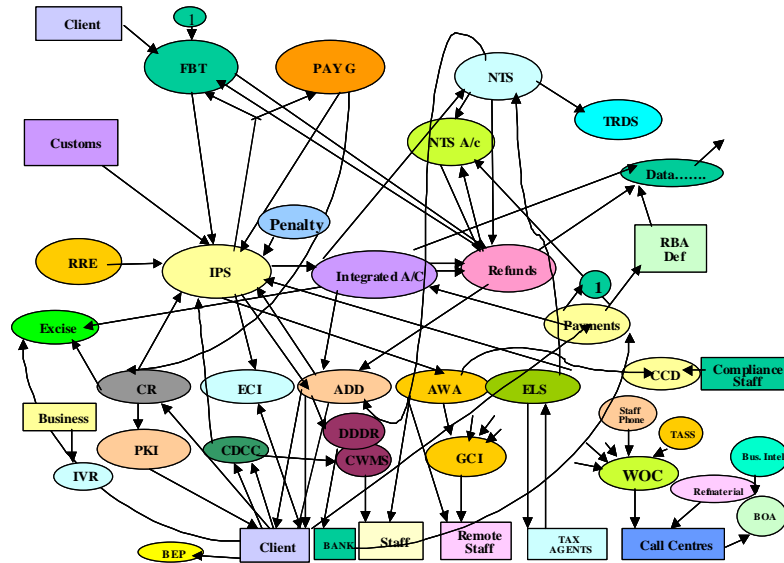
Quick build and difficult to scale
Difficult to apply security

VS.

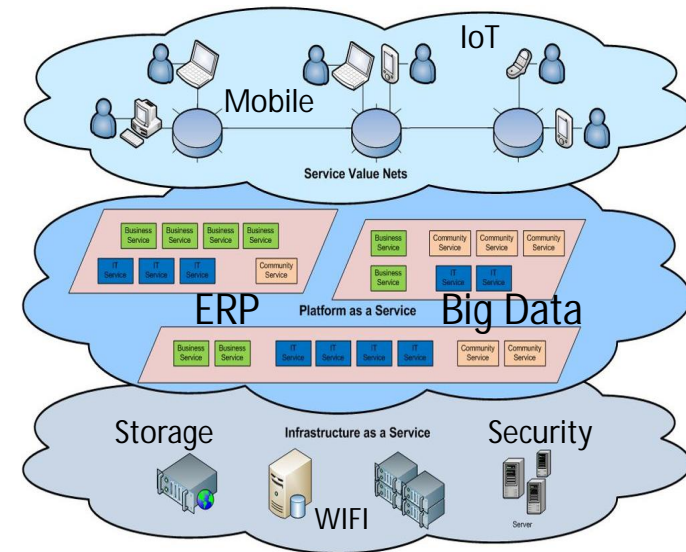


Design for scale and maintain
Secure architecture for growth

without EA vs. with EA



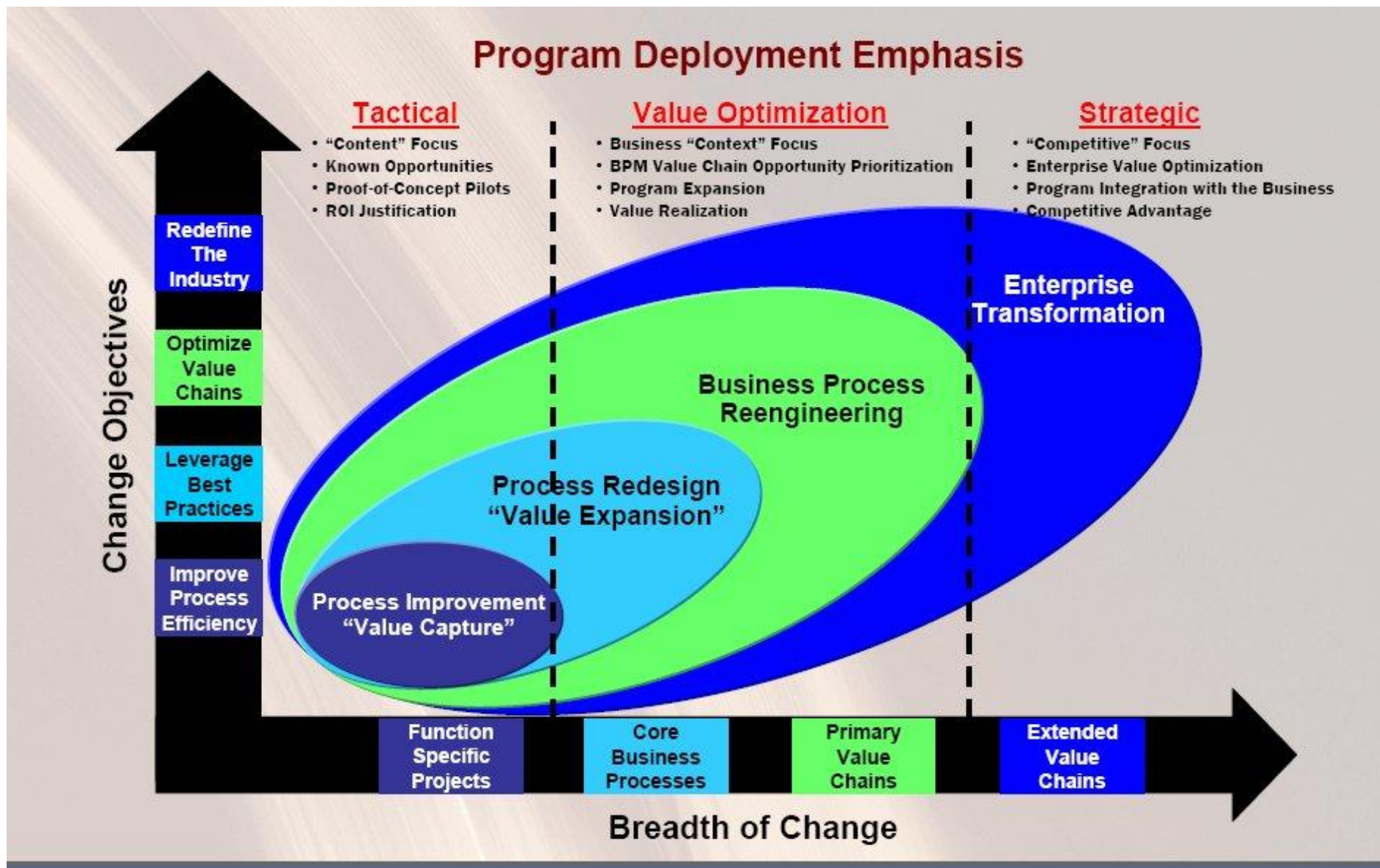
VS.



Without Enterprise Architecture
Inefficient IT
Complex and Delay Response

With Enterprise Architecture
Productive IT
Cloud, Big Data, Social, Mobile

Enterprise Transformation



Types of Architectures

Architecture	Description
Business Architecture	Creating business operating model, business services, organization and business process/policy
Solution Architecture	Creating an information system with its integration
Application Architecture	Creating an application touch points with screen flows and creating report results
Data Architecture	Creating data model both structured and unstructured data and governance framework
Technology and Infrastructure Architecture	Creating digital infrastructure and smart office including network, office automation, wireless, storage, cloud, big data and security infrastructure
Enterprise Architecture	Creating enterprise blueprint with facilitate all architects and key users to build transitioning roadmap

Key Benefits from Enterprise Architecture

Benefit	Description
Productivity	Faster to build new service from existing IT inventory
Innovation	Enterprise can be able to create new innovation by using EA centralized repository
Cost Saving	Cost saving with reusable process, application, data and infrastructure
Reduce Risk	EA governs the change impact analysis for new services deployment
Digital platform establishment	EA creates a foundation for digital business execution including cloud, big data, social, mobile, and smart workforce
Enterprise Architecture	Creating enterprise blueprint with facilitate all architects and key users to build transitioning roadmap

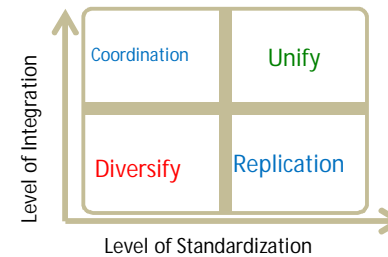
A Foundation for Business Execution

Key Components

Reference Models/ Artifacts / Guidelines

Operating Model

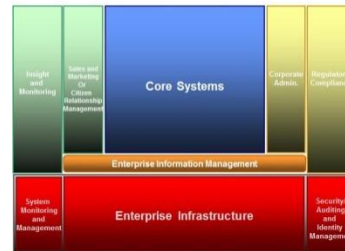
The necessary level of business process integration and the necessary level of business process standardization



Enterprise Architecture

The Reference Models, Relationships, Maturity Model with Guiding Principles for Business and IT Alignment

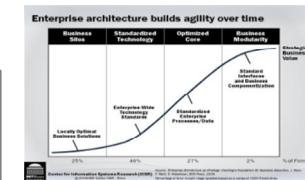
EA Reference Model



EA Repository



EA Maturity Model

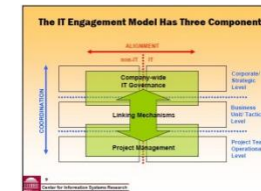
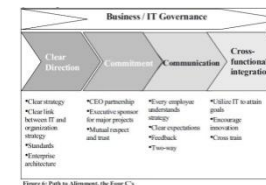


Engagement Model

The Development Process, Governance and Project Management

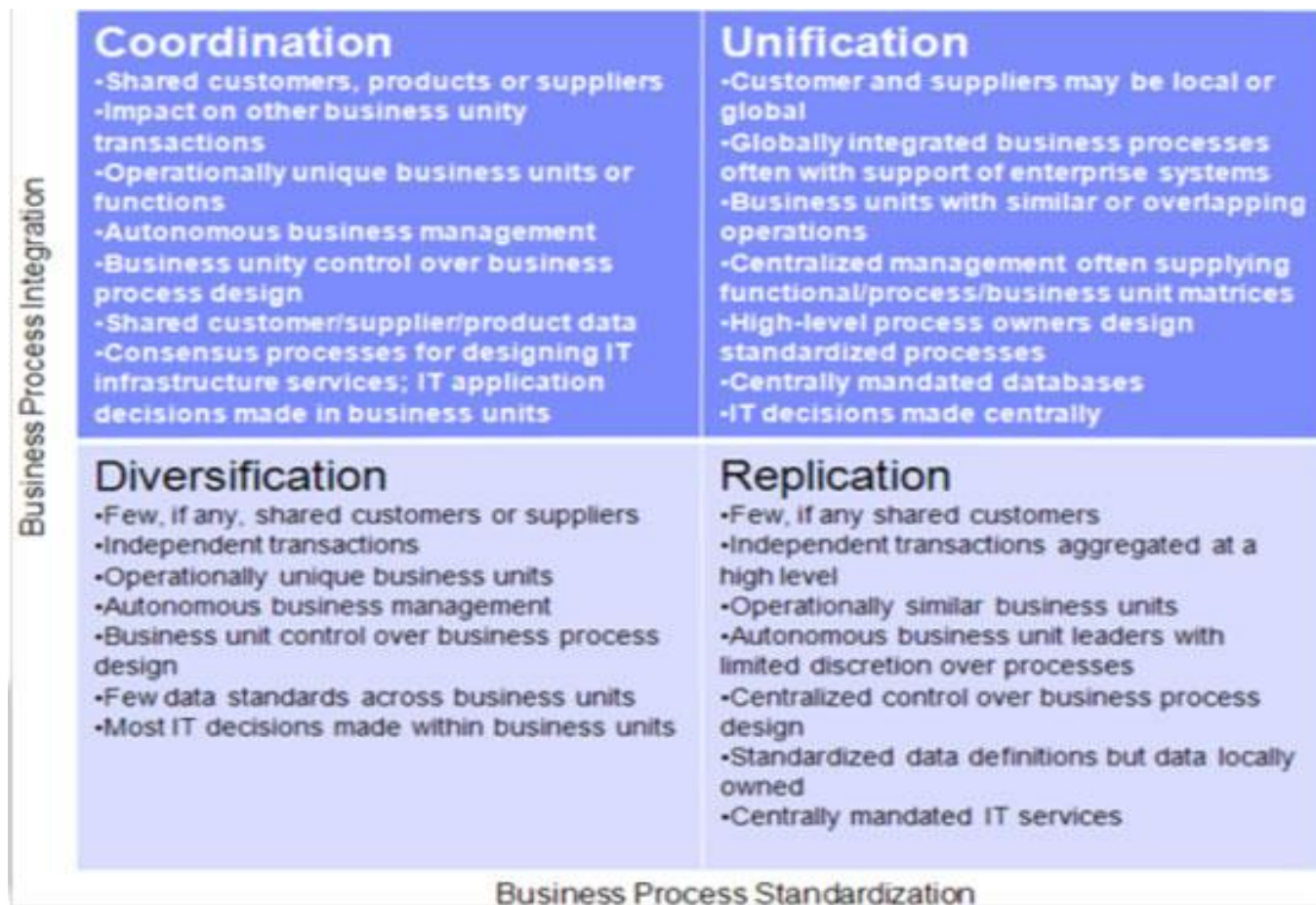
Enterprise Architecture Development Process The Engagement Guideline

1. Select program or project to start (NOT high risk) supported by business executives
2. Establish Virtual Team maintain standard architecture development method
3. Acquire and Maintain Knowledge of Enterprise Architecture Development with change and feed back communication system
4. Create architecture reference based on current deployments
5. Develop new architecture layered model from current deployment with business alignment and operation life cycle consideration
6. Replicate to new program or project development



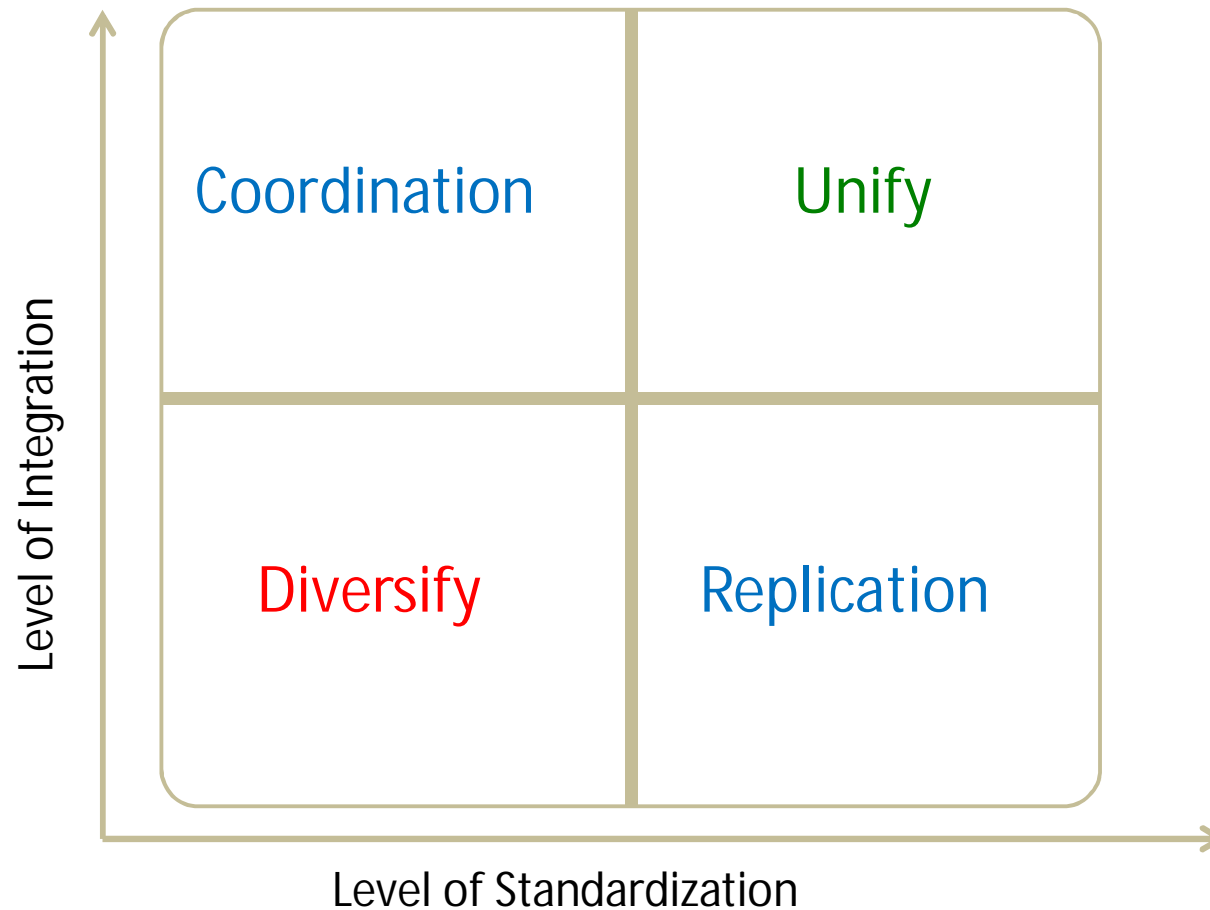
Operating Model

“The operating model is an abstraction representation of the necessary level of business process integration and the necessary level of business process standardization”



Operating Model in Business

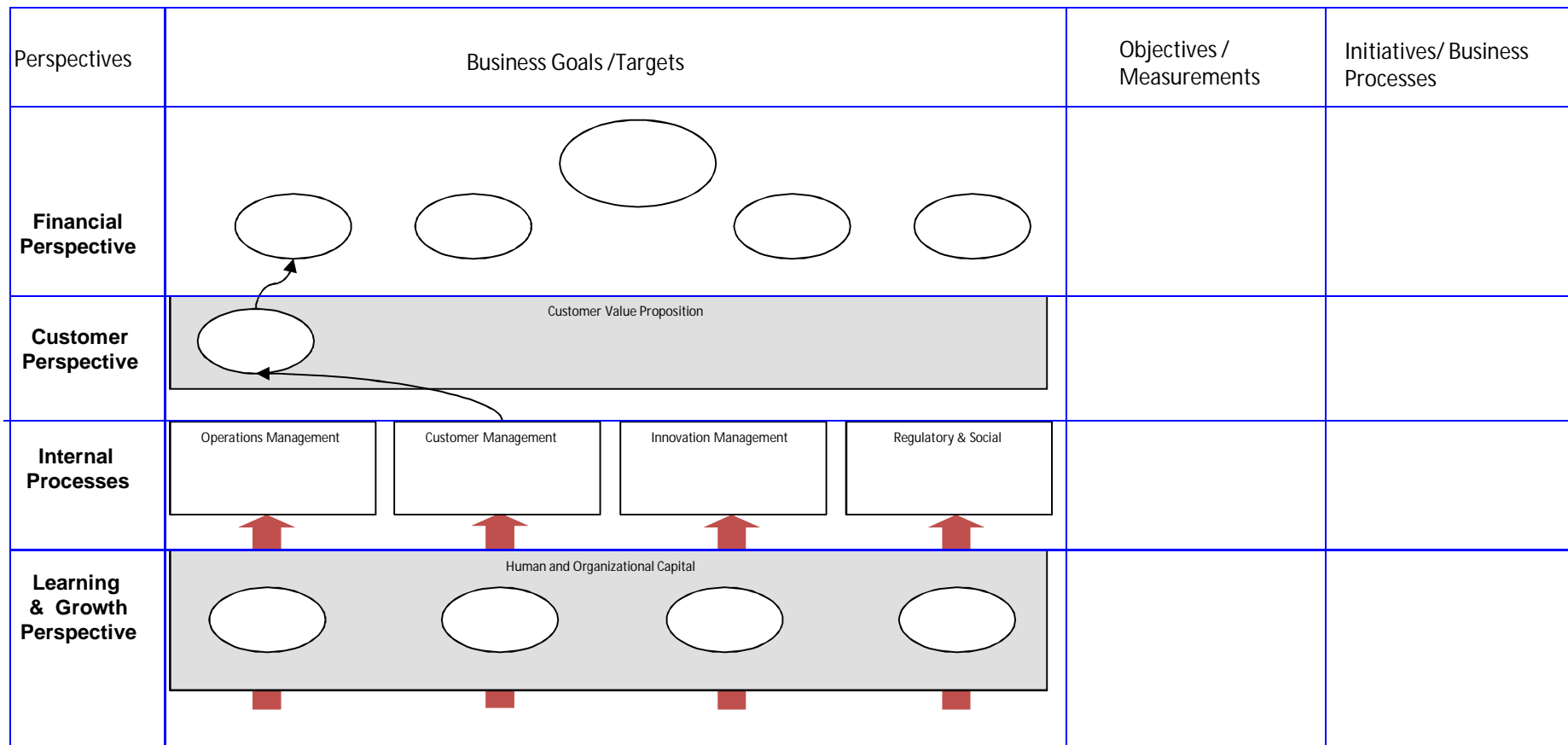
“The operating model is an abstraction representation of the necessary level of business process integration and the necessary level of business process standardization”



Business Strategy Map

Purpose	<ul style="list-style-type: none">• A Business Strategy Map is a visual representation of the strategy of an organization. It illustrates how the organization plans to achieve its mission and vision by means of a linked chain of continuous improvements.
How to Use the Artifact	<ul style="list-style-type: none">• Business Strategy Maps describe an organization's strategies from four perspectives:<ul style="list-style-type: none">• Financial perspective• Customer perspective• Internal (business) process perspective• Learning and growth perspective
Audience	<ul style="list-style-type: none">• Executive Stakeholders• Line of Business Executives

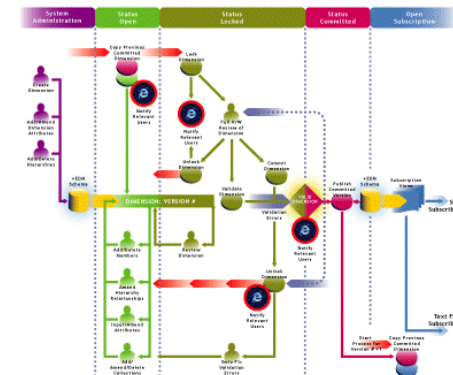
Group Workshop - Business Goal and Strategy Map



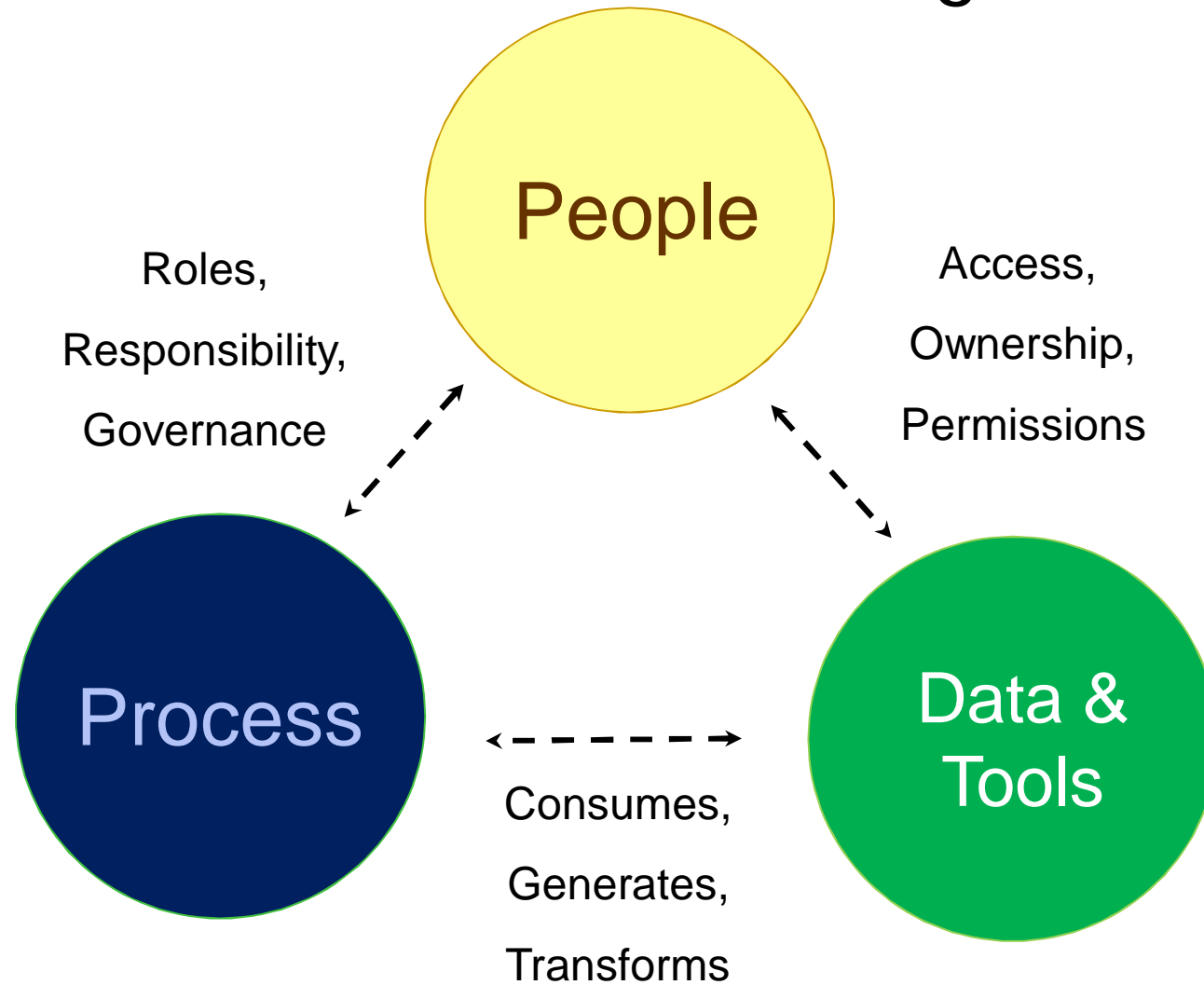
Business Process Management

Business process management (BPM) is a management approach focused on **aligning all aspects of an organization**.

It promotes business **effectiveness** and **efficiency** while striving for **innovation**, **flexibility**, and **integration with technology**.



Business Process Management



EA and BPM

EA Goals

- Enterprise planning
 - Describe current and future state of the structure of an enterprise
- Business-IT alignment
 - Links between business/technology artefacts
 - Business visibility and measurement
- Change-friendly capability delivery
 - Adaptable and agile for continuous change

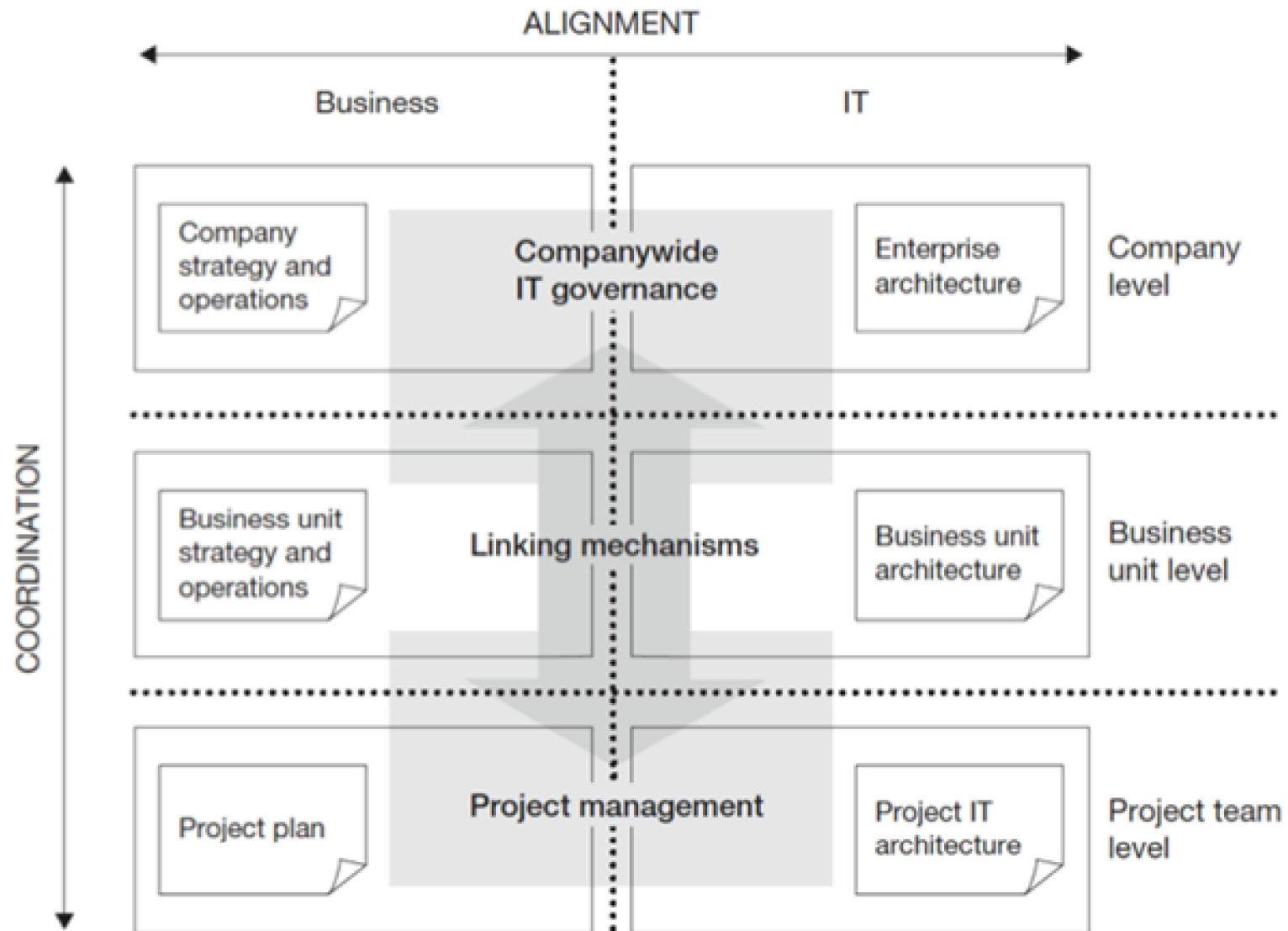
BPM Goals

- Efficiency
 - Automating steps and handoffs
 - Integrating systems and data sources
- Compliance
 - Achieving and proving standardization
- Agility
 - Changing processes quickly and easily
- Visibility
 - See what's happening in a process

Common Enterprise Business Process Samples

Process	Business Process Owner
Human resource processes: <ul style="list-style-type: none"> ■ Hiring <ul style="list-style-type: none"> ✓ Requisition process ✓ Sourcing process ✓ Job fair process ✓ Orientation process ■ Training <ul style="list-style-type: none"> ✓ Need identification process ✓ Course development process ✓ Evaluation process ■ Compensation and benefits <ul style="list-style-type: none"> ✓ Salary planning process ✓ Budget process ✓ Job-leveling process ✓ New hire pay process 	<p>Ephron Levy</p> <p>Fernando Ruiz</p> <p>Susan Gail</p>
Sales and marketing processes: <ul style="list-style-type: none"> ■ Portfolio management ■ Market planning/segmentation ■ Advertising ■ Distribution ■ Lead development ■ Account management ■ Sales and marketing administration ■ Revenue generation 	<p>Bob Johns</p> <p>Samantha Smith</p> <p>Steven Parker</p> <p>Hussein Riyad</p> <p>Abigail Adams</p> <p>Lavali Chopras</p> <p>John Smith</p> <p>Jennifer Harding</p>
Finance processes: <ul style="list-style-type: none"> ■ Budgeting and forecasting ■ Payroll ■ Tax planning ■ Risk management ■ Cash management 	<p>Alejandro Izquierdo</p> <p>Darpan Gupta</p> <p>Cybil Johnson</p> <p>Tim Seinfeld</p> <p>Susan Case</p>
Information technology processes: <ul style="list-style-type: none"> ■ Application development ■ Change order ■ Client relationship ■ Portfolio management ■ Program management ■ Incident management 	<p>Ajit Ganeshes</p> <p>Isabel Munoz</p> <p>Brigitte Dupree</p> <p>Bill Stein</p> <p>Tom Williams</p> <p>Paul Reines</p>

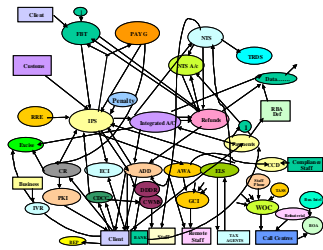
Business and IT Alignment



MIT Sloan Center, 2011

พัฒนาการของการใช้ไอทีในองค์กร

Silo

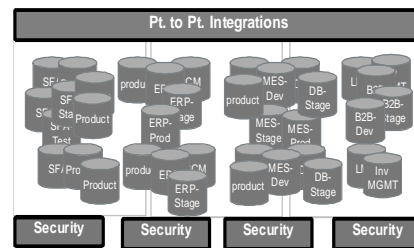
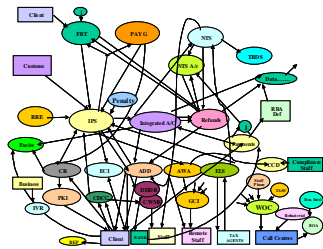


- ต่างคนต่างทำ แล้ว
มาเชื่อมกันทีหลัง
- ระบบงานกระจัด
กระจาย เชื่อมต่อกัน
ขาดมาตรฐาน
- เปลี่ยนแปลงยาก
- ขยายระบบยาก
- ใช้เวลามากในการ
จัดการ และ
แก้ปัญหา
- มีความเสี่ยงสูง

พัฒนาการของการใช้ไอทีในองค์กร

Silo

Standardization



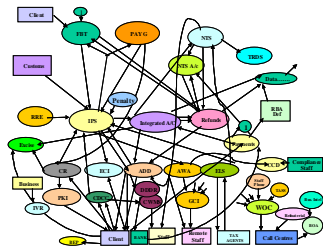
- ต่างคนต่างทำ แล้ว
มาเชื่อมกันทีหลัง
- ระบบงานกระจาย
กระจาย เชื่อมต่อกัน
ขาดมาตรฐาน
- เปลี่ยนแปลงยาก
- ขยายระบบยาก
- ใช้เวลามากในการ
จัดการ และ
แก้ปัญหา
- มีความเสี่ยงสูง
- จัดกลุ่มกระบวนการ
ทำงาน และ
ทรัพยากรไอที
- มีมาตรฐานในการ
รับส่งข้อมูล
- ประหยัดค่าใช้จ่าย
ด้าน SW License
และ support
- ลดต้นทุนด้าน IT
project
time/costs/risks

พัฒนาการของการใช้ไอทีในองค์กร

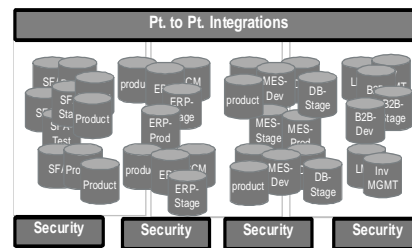
Silo

Standardization

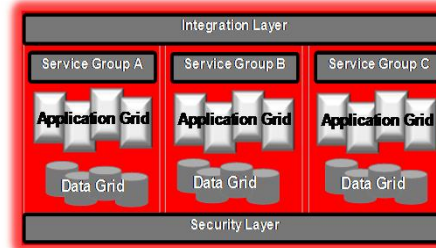
Optimization



- ต่างคนต่างทำ แล้วมาเชื่อมกันทีหลัง
- ระบบงานกระจาย กระจาย เชื่อมต่อกันขาดมาตรฐาน
- เปลี่ยนแปลงยาก
- ขยายระบบยาก
- ใช้เวลามากในการจัดการ และแก้ปัญหา
- มีความเสี่ยงสูง



- จัดกลุ่มกระบวนการทำงาน และทรัพยากรไอที
- มีมาตรฐานในการรับส่งข้อมูล
- ประหยัดค่าใช้จ่ายด้าน SW License และ support
- ลดต้นทุนด้าน IT project time/costs/risks



- ตัดกระบวนการทำงานที่ซ้ำซ้อน
- ลดทรัพยากรทางไอทีที่ไม่จำเป็น
- ผลให้บริการด้านไอทีได้เร็วขึ้น
- เพิ่มความปลอดภัยด้านไอที

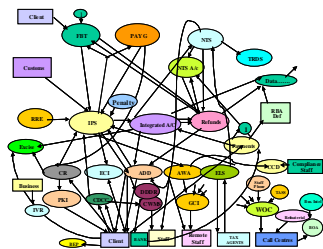
พัฒนาการของการใช้ไอทีในองค์กร

Silo

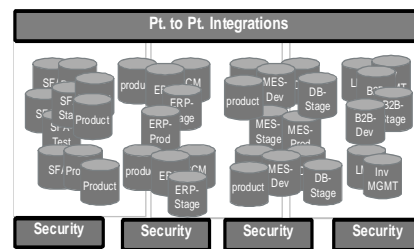
Standardization

Optimization

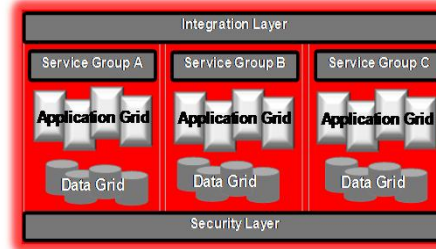
Modularity



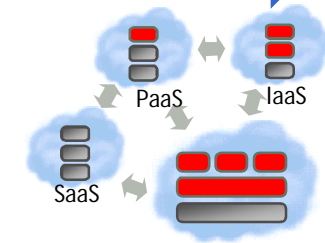
- ต่างคนต่างทำ แล้วมาเชื่อมกันทีหลัง
- ระบบงานกระจาย กระจาย เชื่อมต่อกันขาดมาตรฐาน
- เปลี่ยนแปลงยาก
- ขยายระบบยาก
- ใช้เวลามากในการจัดการ และแก้ปัญหา
- มีความเสี่ยงสูง



- จัดกลุ่มกระบวนการทำงาน และทรัพยากรไอที
- มีมาตรฐานในการรับส่งข้อมูล
- ประหยัดค่าใช้จ่ายด้าน SW License และ support
- ลดต้นทุนด้าน IT project time/costs/risks

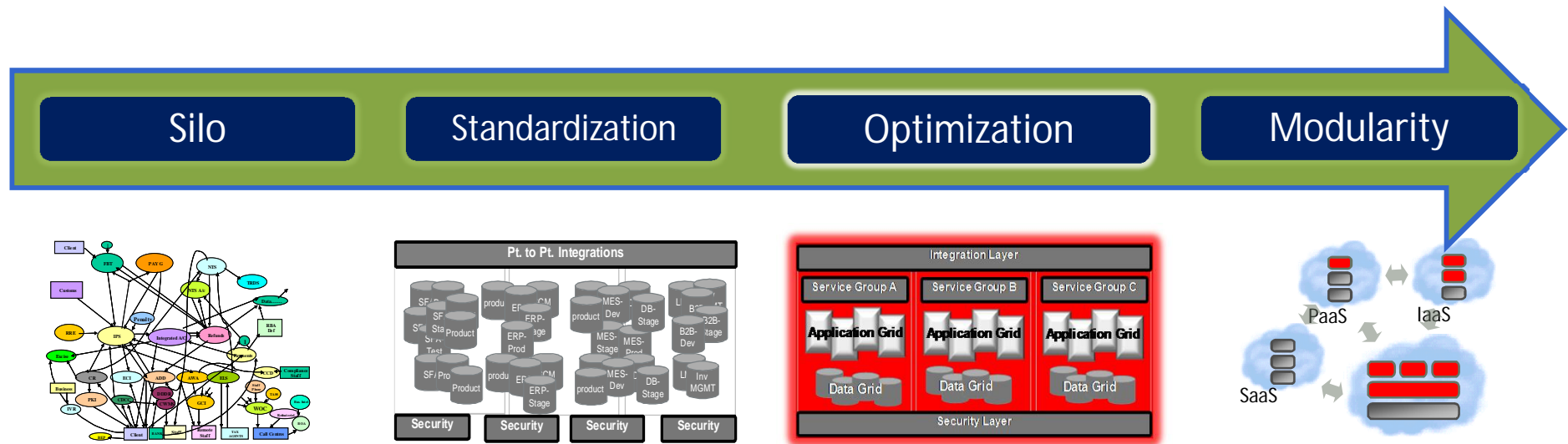


- ตัดกระบวนการทำงานที่ซ้ำซ้อน
- ลดทรัพยากรทางไอทีที่ไม่จำเป็น
- ผลให้บริการด้านไอทีได้เร็วขึ้น
- เพิ่มความปลอดภัยด้านไอที



- แบ่งกลุ่มบริการทางด้านไอทีโดยมุ่งการต่อยอดบริการใหม่ๆ ให้เร็วที่สุด
- ผลให้บริการได้เร็วและปลอดภัย
- การวางแผนทาง IT ทำควบคู่ไปกับการวางแผนทางธุรกิจ
- เจ้าหน้าที่ไอทีทำงานได้เต็มประสิทธิภาพ

Enterprise Architecture Maturity – Details



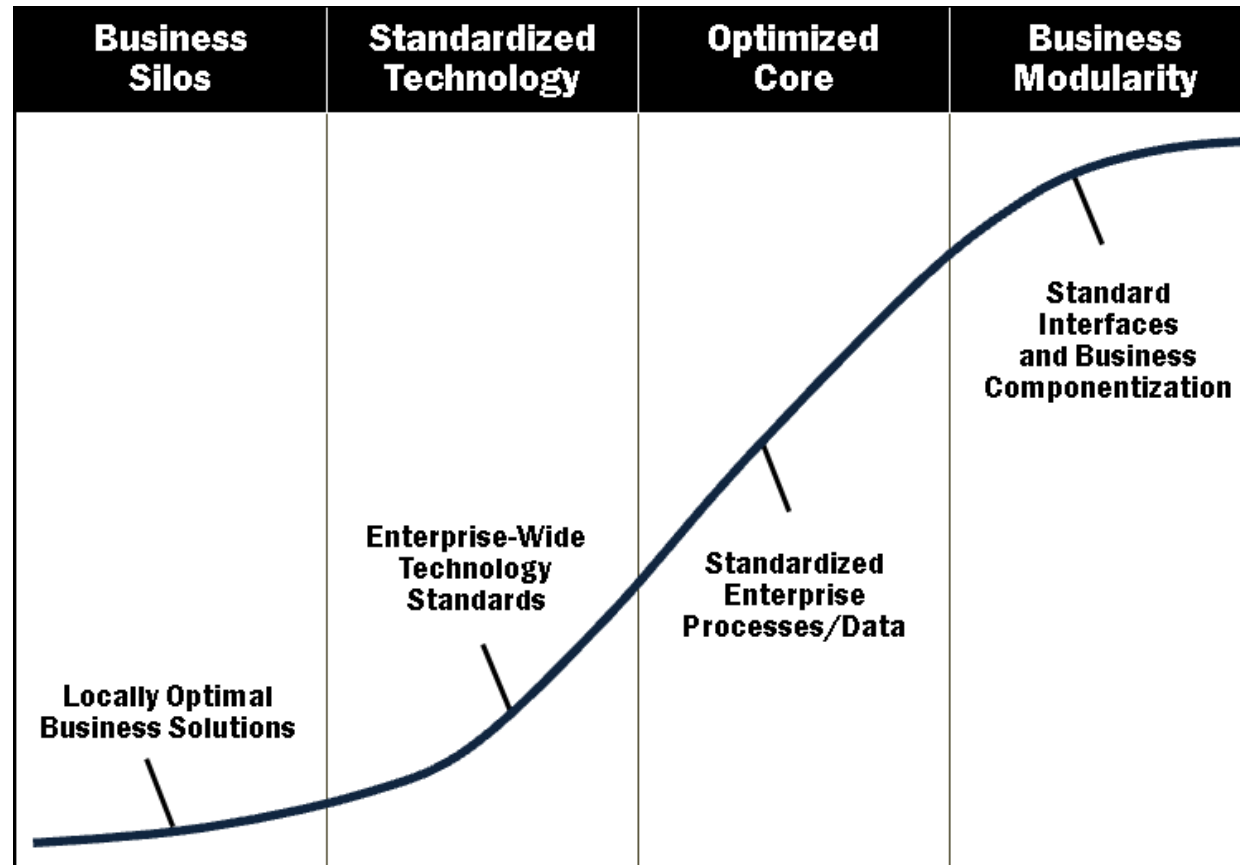
- **Local IT silos**
- **Peak load sized**
- **Difficult to scale**
- **Difficult to change**
- **Expensive to manage**
- **Complexity driven risk**

- **Standardized interfaces/systems**
- **Lower license and support costs**
- **Increased utilization of IT skills**
- **Reduced IT project time/costs/risks**

- Pools of resources
- Consolidated
- Better productivity
- Higher QoS
- Improved IT agility
- Improved security and management

- **Rapid provisioning**
- **Lower costs**
- **IT as a “Business”**
- **Faster project turnaround**
- **Greater focus on business**

Enterprise Architecture Maturity Model

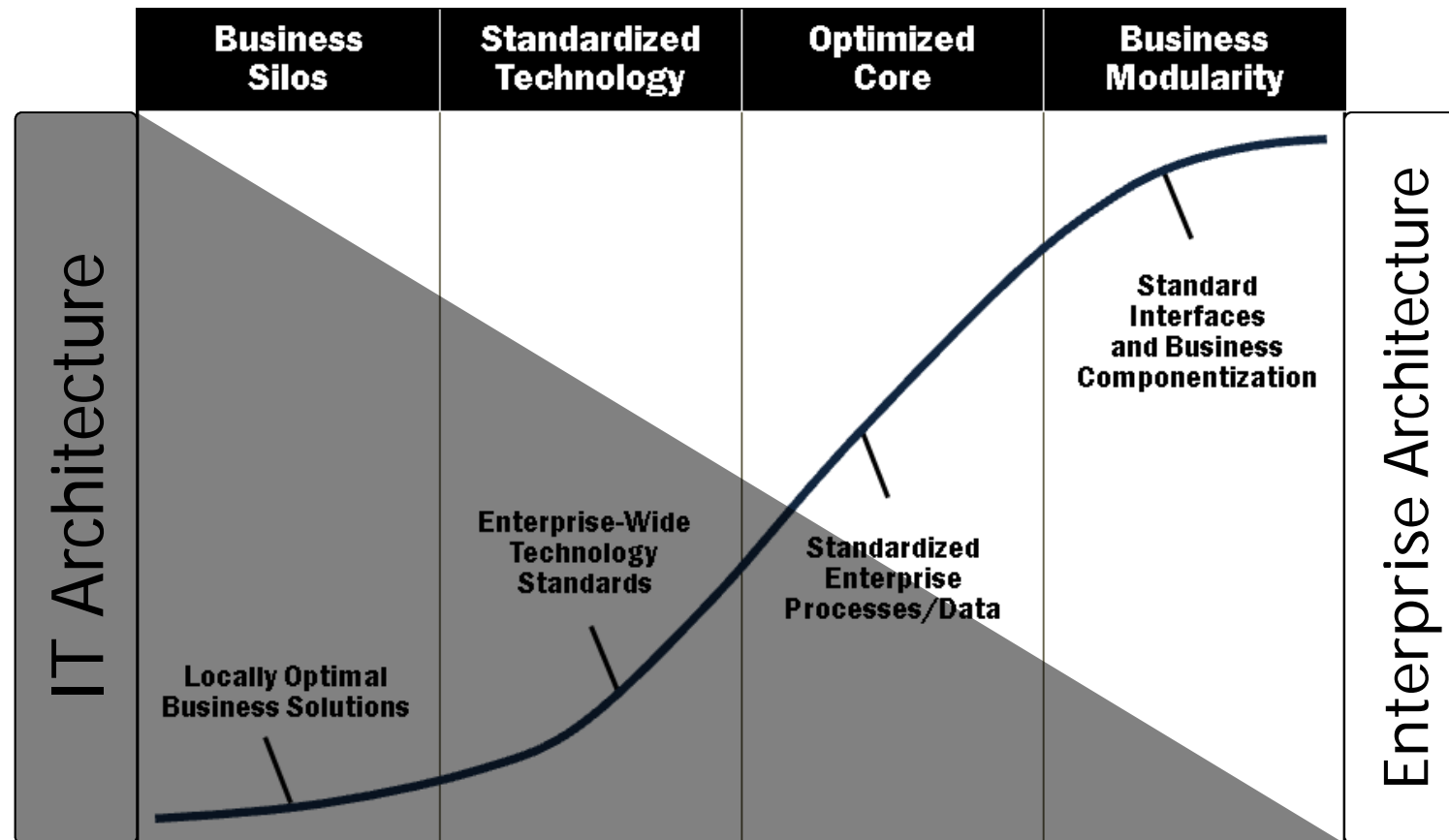


Center for Information Center Systems Research (CISR)

2009 MIT Sloan CISR – Ross

Source: *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*, J. Ross, P. Weill, D. Robertson, HBS Press, 2006

Enterprise Architecture Maturity Model



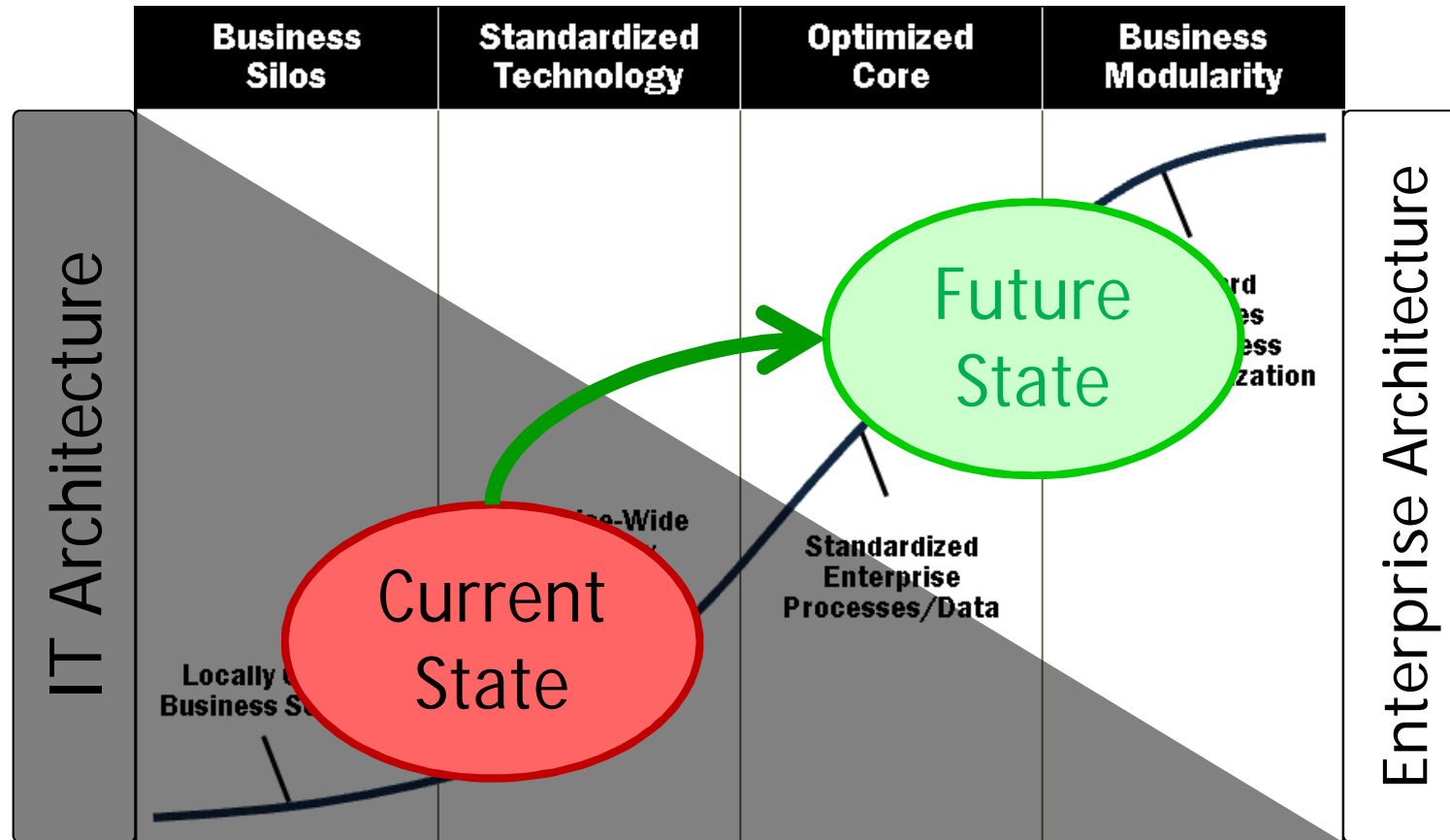
Center for Information Center Systems Research (CISR)

2009 MIT Sloan CISR – Ross

Source: *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*, J.

Ross, P. Weill, D. Robertson, HBS Press, 2006

Enterprise Architecture Maturity Model



Center for Information Center Systems Research (CISR)

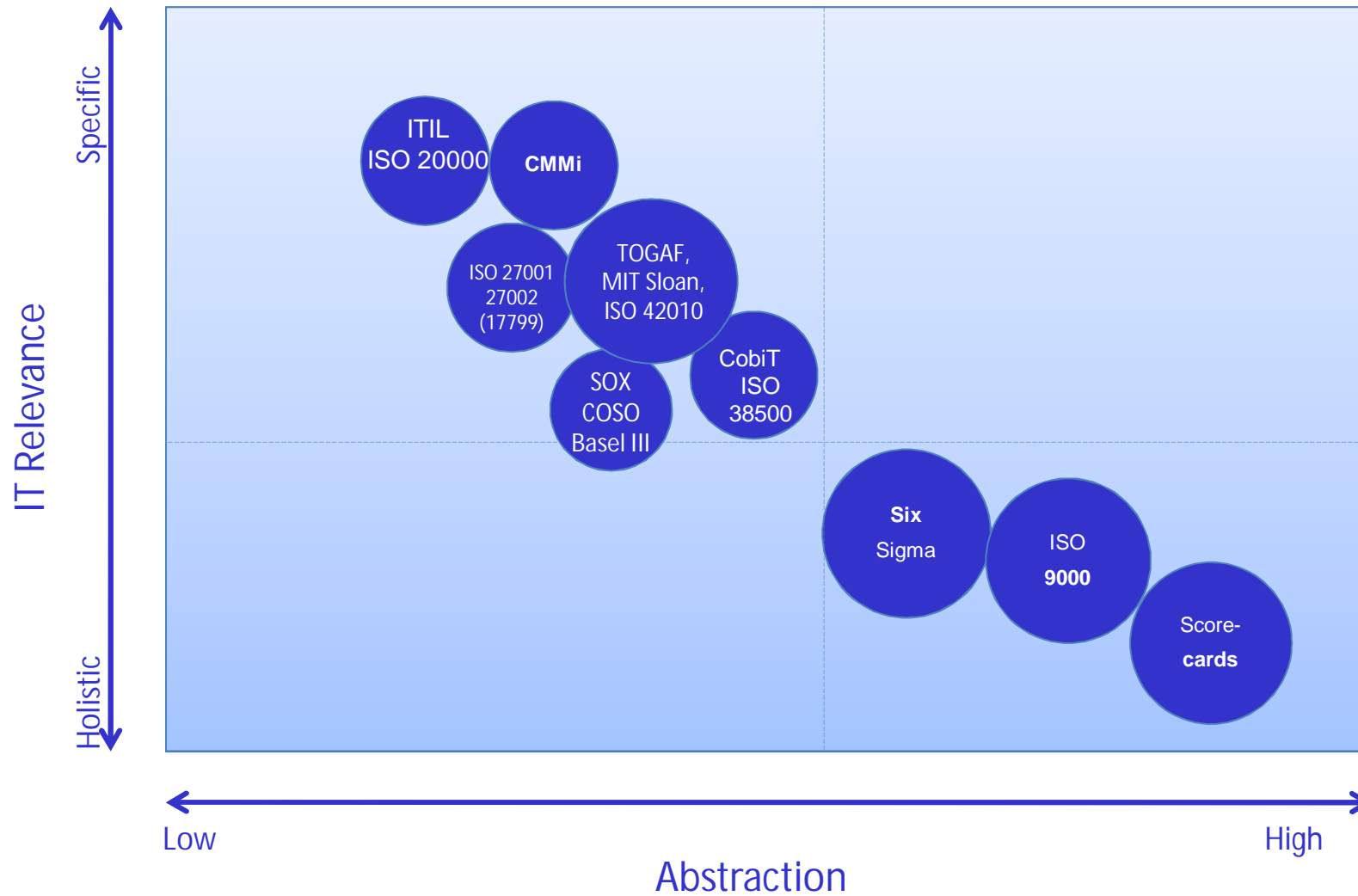
2009 MIT Sloan CISR – Ross

Source: *Enterprise Architecture as Strategy: Creating a Foundation for Business Execution*, J.

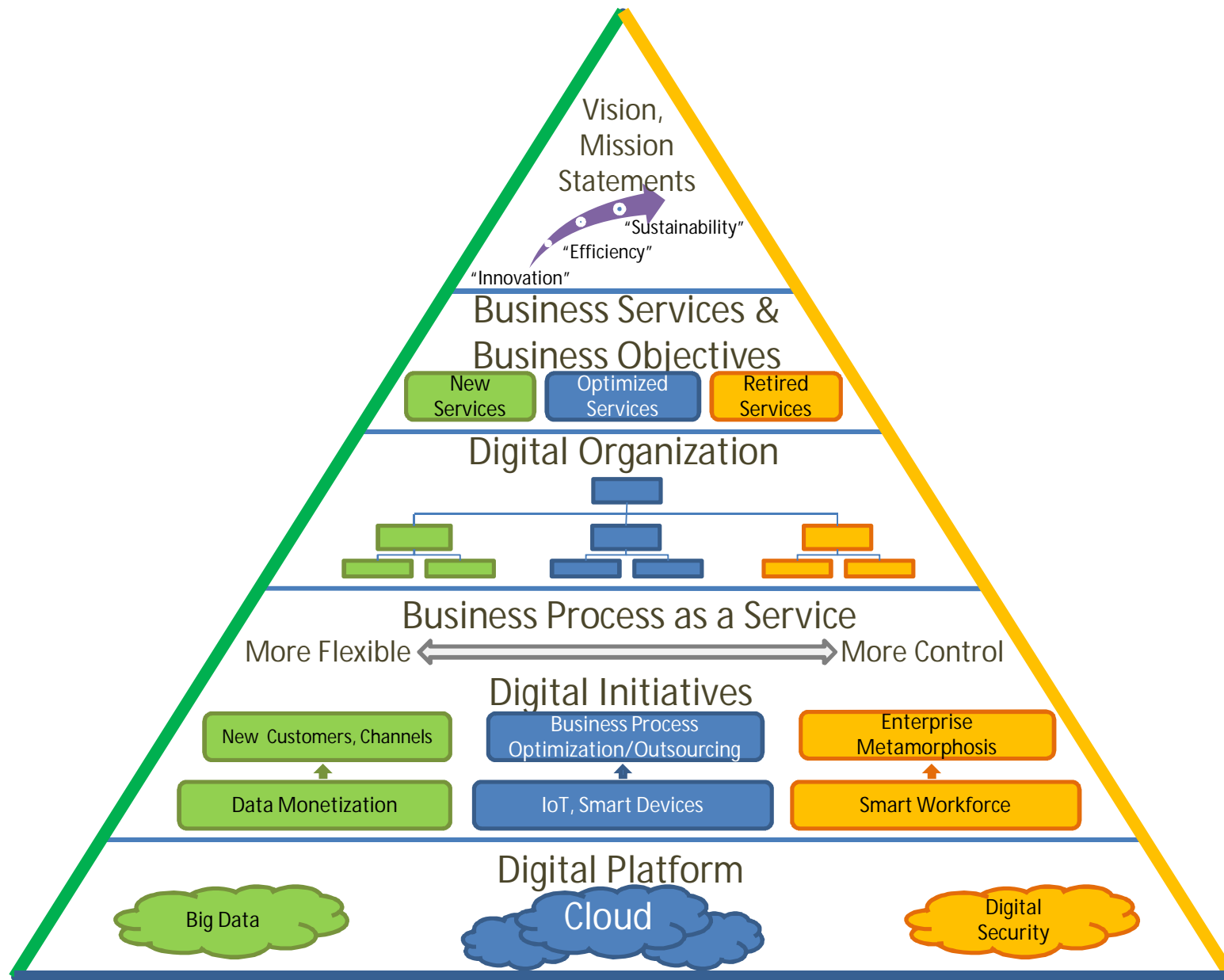
Ross, P. Weill, D. Robertson, HBS Press, 2006

Building Enterprise Architecture

There are many of related standards/guidelines



Digital Transformation Reference Model



Building Enterprise Architecture

The Digital Transformation Guideline















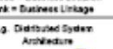















1. Select program or project to start (NOT high risk) supported by C-Level
2. Establish Virtual Team maintain standard architecture development method
3. Acquire and Maintain Knowledge of Enterprise Architecture Development with change and feed back communication system
4. Create architecture reference based on current deployments
5. Develop new architecture layered model from current deployment with business alignment and operation life cycle consideration
6. Replicate to new program or project development

Architecture Principles

No.	Name	Statement
1	Primacy of Principles	These principles of information management apply to all organizations within the enterprise.
2	Maximize Benefit to the Enterprise	Information management decisions are made to provide maximum benefit to the enterprise as a whole.
3	Information Management is Everybody's Business	All organizations in the enterprise participate in information management decisions needed to accomplish business objectives.
4	Business Continuity	Enterprise operations are maintained in spite of system interruptions.
5	Common Use Applications	Development of applications used across the enterprise is preferred over the development of similar or duplicative applications which are only provided to a particular organization.
6	Compliance with Law	Enterprise information management processes comply with all relevant laws, policies, and regulations.
7	IT Responsibility	The IT organization is responsible for owning and implementing IT processes and infrastructure that enable solutions to meet user-defined requirements for functionality, service levels, cost, and delivery timing.
8	Protection of Intellectual Property	The enterprise's Intellectual Property (IP) must be protected. This protection must be reflected in the IT architecture, implementation, and governance processes.
9	Data is an Asset	Data is an asset that has value to the enterprise and is managed accordingly.
10	Data is Shared	Users have access to the data necessary to perform their duties; therefore, data is shared across enterprise functions and organizations.
11	Data is Accessible	Data is accessible for users to perform their functions.
12	Data Trustee	Each data element has a trustee accountable for data quality.
13	Common Vocabulary and Data Definitions	Data is defined consistently throughout the enterprise, and the definitions are understandable and available to all users.
14	Data Security	Data is protected from unauthorized use and disclosure. In addition to the traditional aspects of national security classification, this includes, but is not limited to, protection of pre-decisional, sensitive, source selection-sensitive, and proprietary information.
15	Technology Independence	Applications are independent of specific technology choices and therefore can operate on a variety of technology platforms.
16	Ease-of-Use	Applications are easy to use. The underlying technology is transparent to users, so they can concentrate on tasks at hand.
17	Requirements-Based Change	Only in response to business needs are changes to applications and technology made.
18	Responsive Change Management	Changes to the enterprise information environment are implemented in a timely manner.
19	Control Technical Diversity	Technological diversity is controlled to minimize the non-trivial cost of maintaining expertise in and connectivity between multiple processing environments.
20	Interoperability	Software and hardware should conform to defined standards that promote interoperability for data, applications, and technology.

Zachman Framework

- Zachman developed a structure or framework for defining and capturing an architecture
- This framework provides for 6 perspectives or “windows” from which to view the enterprise.

	DATA <i>#What</i>	FUNCTION <i>#How</i>	NETWORK <i>#Where</i>	PEOPLE <i>#Who</i>	TIME <i>#When</i>	MOTIVATION <i>#Why</i>	
SCOPE (CONTEXTUAL)	List of Things Important to the Business 	List of Processes the Business Performs 	List of Locations in which the Business Operates 	List of Organizations Important to the Business 	List of Events Significant to the Business 	List of Business Goals/Strat 	SCOPE (CONTEXTUAL)
<i>Planner</i>	Entity = Piece of Business Thing	Function = Class of Business Process	Node = Major Business Location	People = Major Organizations	Time = Major Business Event	End/Mean/Major Bus. Goal/Critical Success Factor	<i>Planner</i>
ENTERPRISE MODEL (CONCEPTUAL)	e.g. Semantic Model 	e.g. Business Process Model 	e.g. Business Logistics System 	e.g. Work Flow Model 	e.g. Master Schedule 	e.g. Business Plan 	ENTERPRISE MODEL (CONCEPTUAL)
<i>Owner</i>	Ent = Business Entity Rel = Business Relationship	Proc = Business Process IO = Business Resources	Node = Business Location Link = Business Linkage	People = Organization Unit Work = Work Product	Time = Business Event Cycle = Business Cycle	Ent = Business Objective Means = Business Strategy	<i>Owner</i>
SYSTEM MODEL (LOGICAL)	e.g. Logical Data Model 	e.g. Application Architecture 	e.g. Distributed System Architecture 	e.g. Human Interface Architecture 	e.g. Processing Structure 	e.g. Business Rule Model 	SYSTEM MODEL (LOGICAL)
<i>Designer</i>	Ent = Data Entity Rel = Data Relationship	Proc = Application Function IO = User Views	Node = OS Function (Processor, Storage, etc) Link = Link Characteristics	People = Role Work = Deliverable	Time = System Event Cycle = Processing Cycle	Ent = Structural Assertion Means = Action Assertion	<i>Designer</i>
TECHNOLOGY MODEL (PHYSICAL)	e.g. Physical Data Model 	e.g. System Design 	e.g. Technology Architecture 	e.g. Presentation Architecture 	e.g. Control Structure 	e.g. Rule Design 	TECHNOLOGY MODEL (PHYSICAL)
<i>Builder</i>	Ent = Segment/Table/etc. Rel = Pointer/Key/etc.	Proc = Computer Function IO = Data Elements/Sets	Node = Hardware/System Software Link = Link Specifications	People = User Work = Screen Format	Time = Execute Cycle Cycle = Component Cycle	Ent = Condition Means = Action	<i>Builder</i>
DETAILED REPRESENTATIONS (OUT-OF-CONTEXT)	e.g. Data Definition 	e.g. Program 	e.g. Network Architecture 	e.g. Security Architecture 	e.g. Timing Definition 	e.g. Rule Specification 	DETAILED REPRESENTATIONS (OUT-OF-CONTEXT)
<i>Sub-Contractor</i>	Ent = Field Rel = Address	Proc = Language Stmt IO = Control Block	Node = Subprocess Link = Protocol	People = Identity Work = Job	Time = Interval Cycle = Machine Cycle	Ent = Sub-condition Means = Step	<i>Sub-Contractor</i>
FUNCTIONING ENTERPRISE	e.g. DATA	e.g. FUNCTION	e.g. NETWORK	e.g. ORGANIZATION	e.g. SCHEDULE	e.g. STRATEGY	FUNCTIONING ENTERPRISE

TOGAF Architecture Development Method

The ADM method consists of eight main phases. As preliminary work, the enterprise architecture framework and architecture principles are fixed for the effort. In the following, a short description of the phases.

A. Architecture vision is the analysis phase of EA project. The project is organized; the scope and domain requirements and constraints are stated. Business scenarios can be used for this.

B. In the Business architecture phase, the current baseline architecture is stated, target architecture is designed and a gap analysis between the two takes place.

C. Information systems architecture consists of the parts Data and Applications. For Data architecture, the types and sources of data needed in the enterprise are defined and a data model is created. A gap analysis is conducted and data model is compared with the business architecture. As to the applications, the applications needed to meet the specified business requirements and data model are turned into an applications architecture and are checked back with the business architecture.

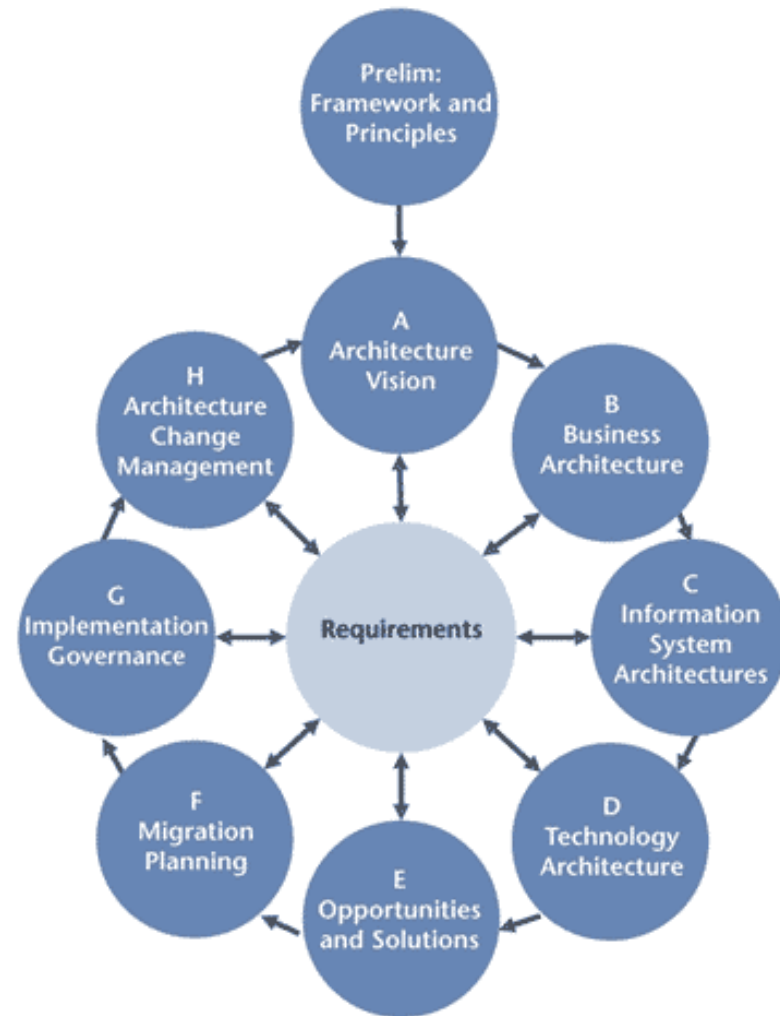
D. For Technology architecture, the previous phases deliver inputs. In this phase, a baseline architecture is stated, and the target technology architecture is designed.

E. Opportunities and solutions is the evaluation phase, where the solutions are selected.

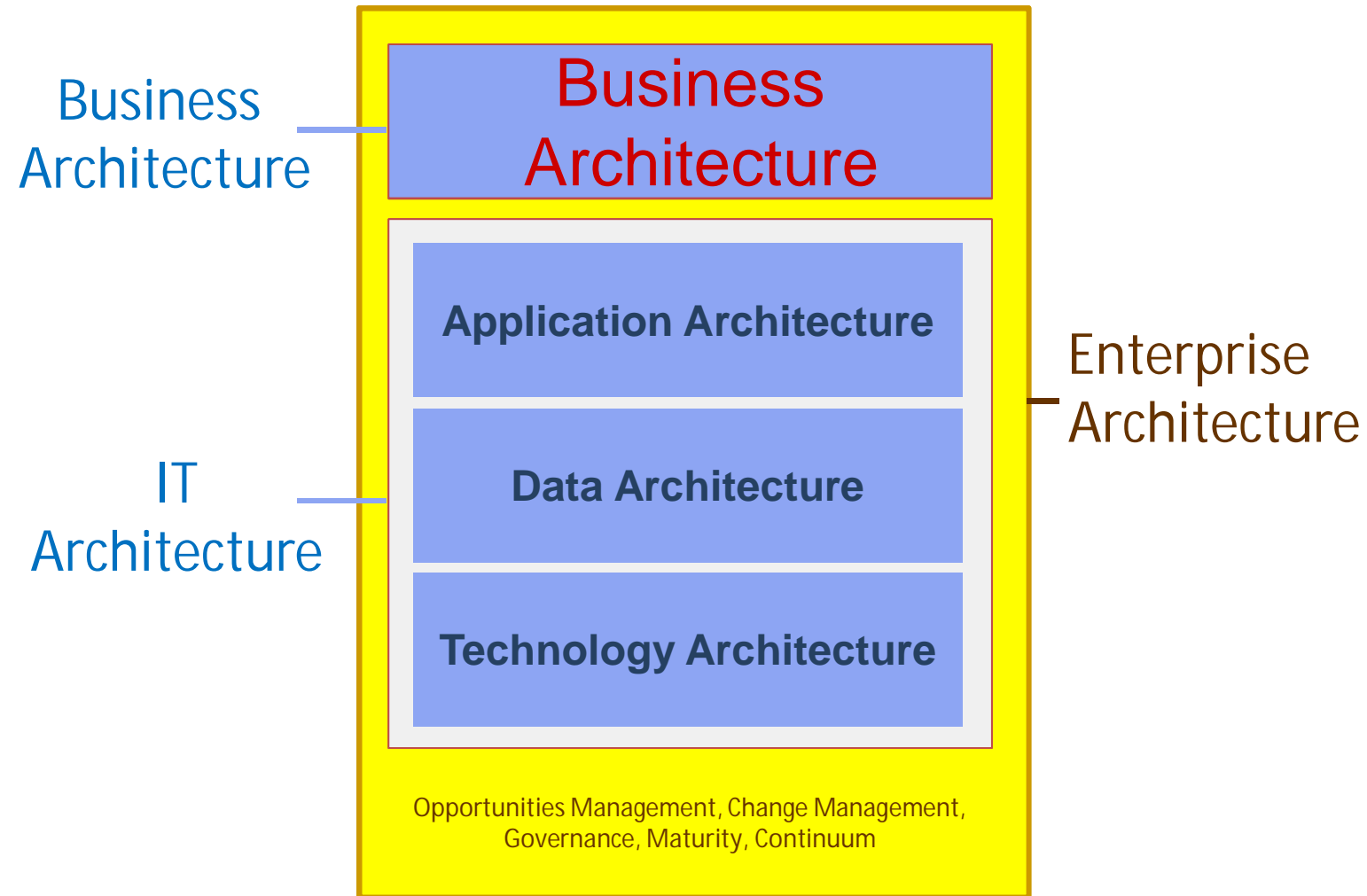
F. Migration planning is the point for checking dependencies in the environment and preparing for implementation of the target architecture.

G. Implementation and Governance is about the administration of implementation and deployment phase of the development project.

H. Architecture change management is the maintenance phase. A new baseline is created and changes in business environment are monitored as well as new technology opportunities.



Business Architecture & IT Architecture



The Enterprise Reference Model



The Enterprise Reference Model



The Enterprise Reference Model



The Enterprise Reference Model



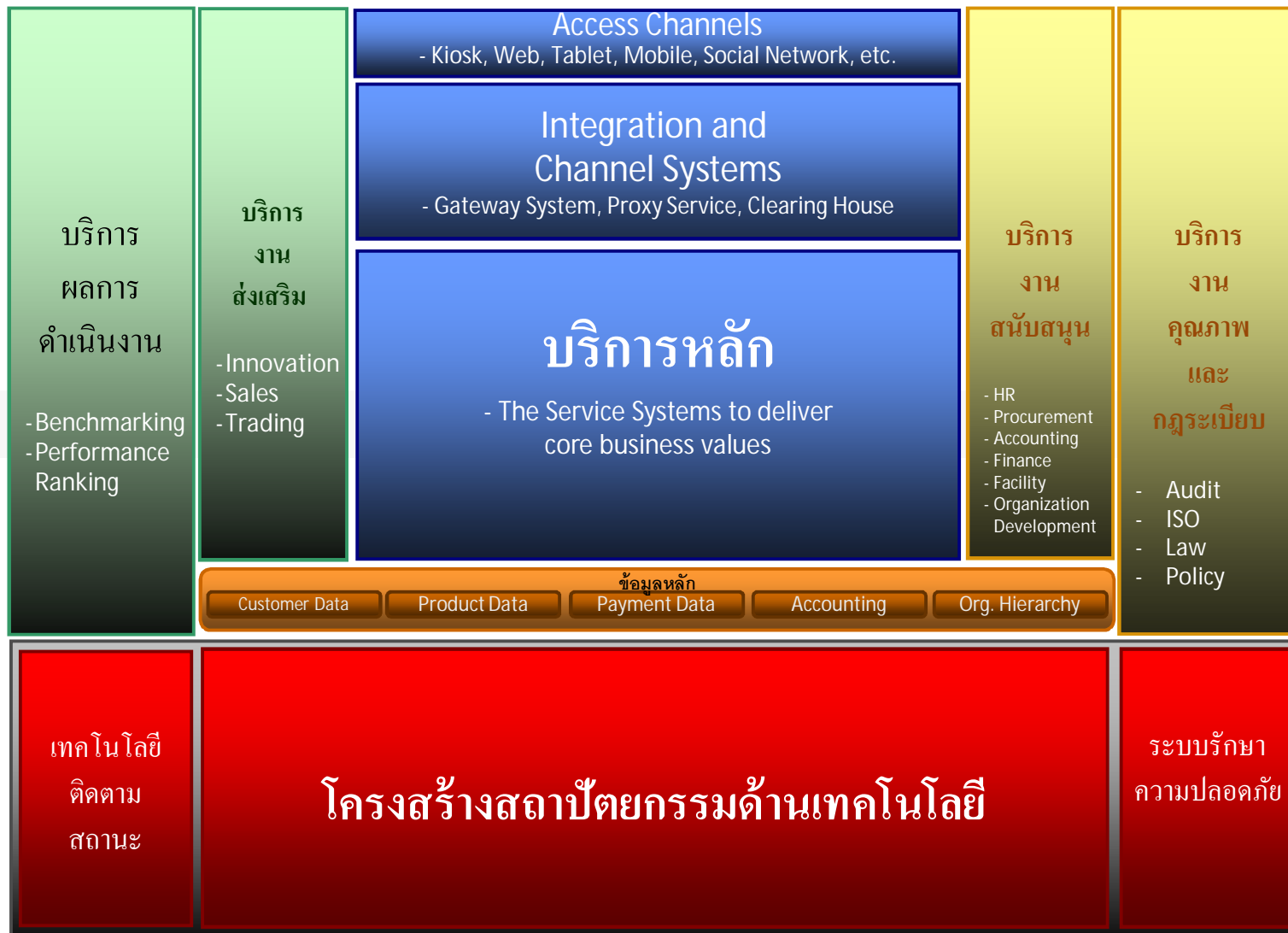
The Enterprise Reference Model



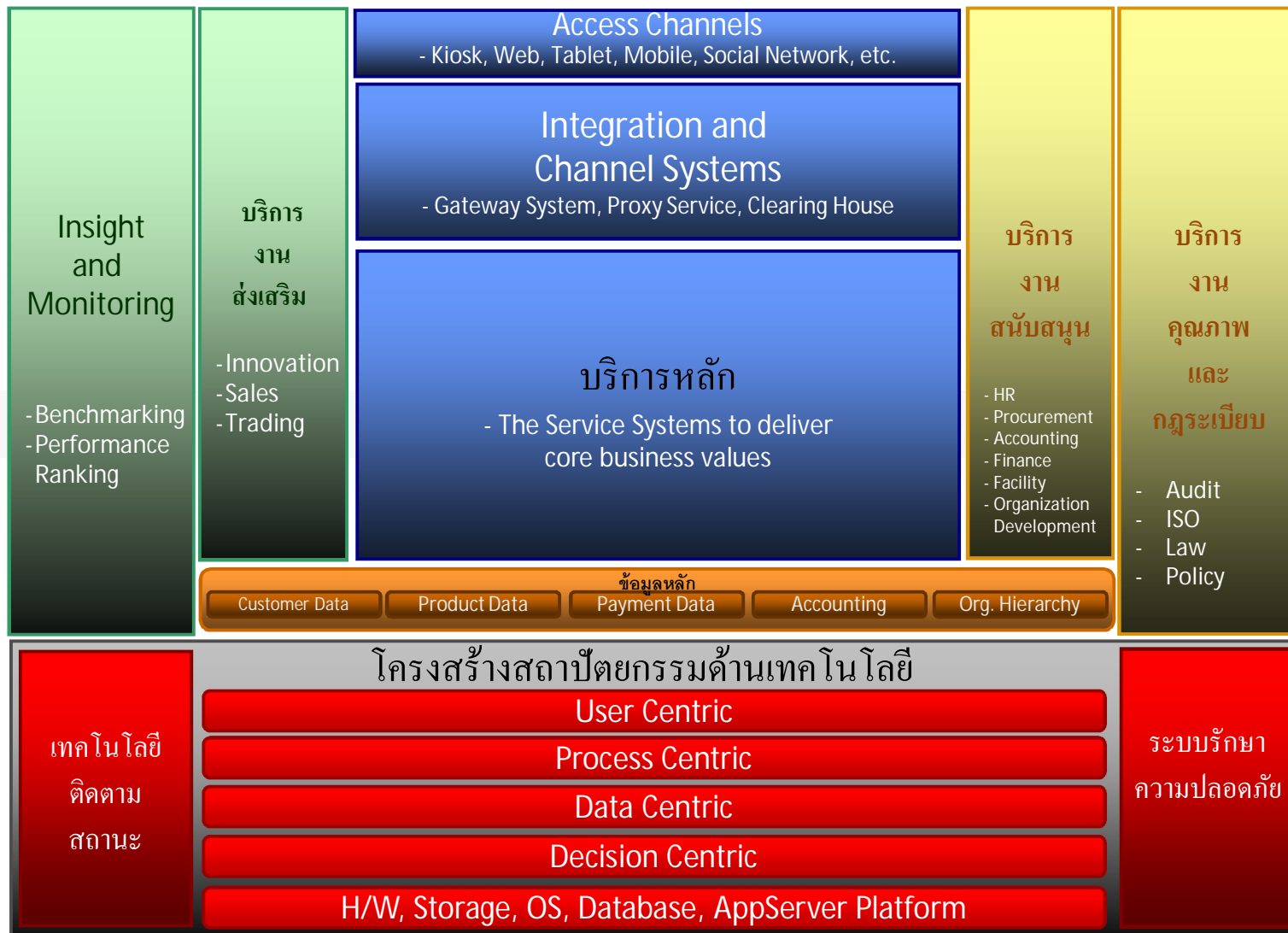
The Enterprise Reference Model



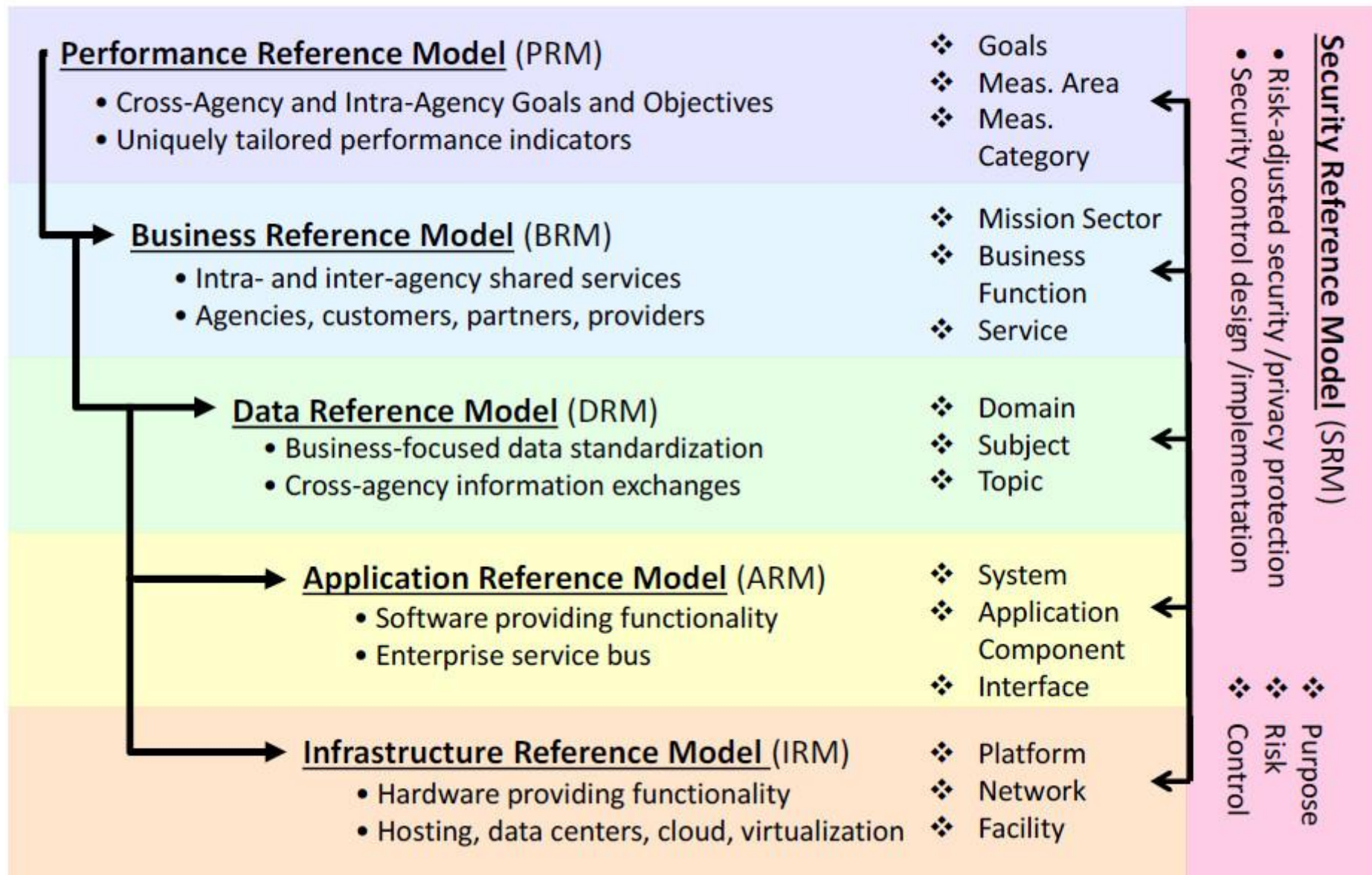
The Enterprise Reference Model



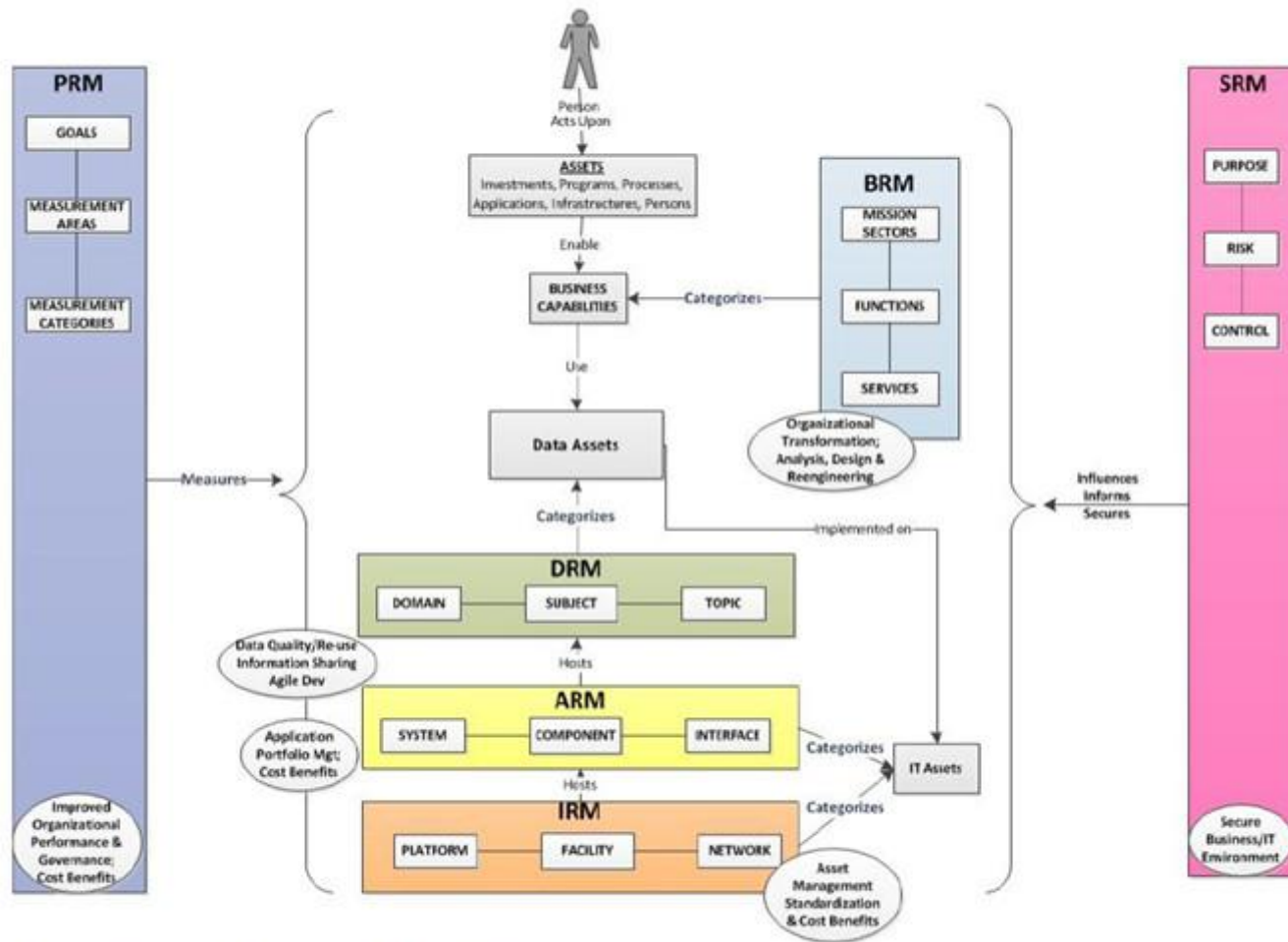
The Enterprise Reference Model



Consolidated Reference Model (CRM)



FEA Reference Models Relationship



<https://www.whitehouse.gov/omb/e-gov/fea>

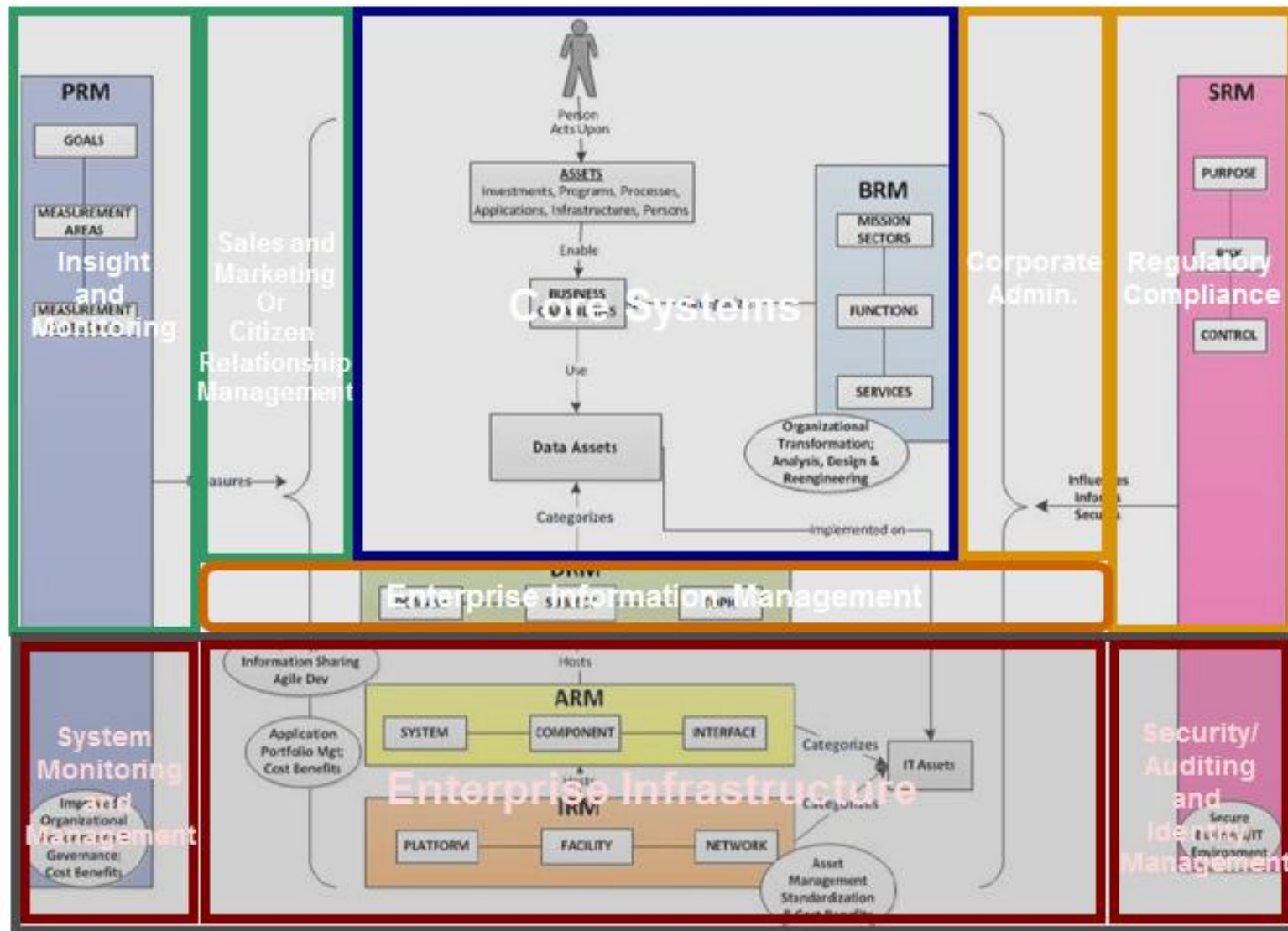
2015, danairat@gmail.com

FEA 2.0, www.whitehouse.gov/omb/fea

Danairat T.

The Enterprise Reference Model

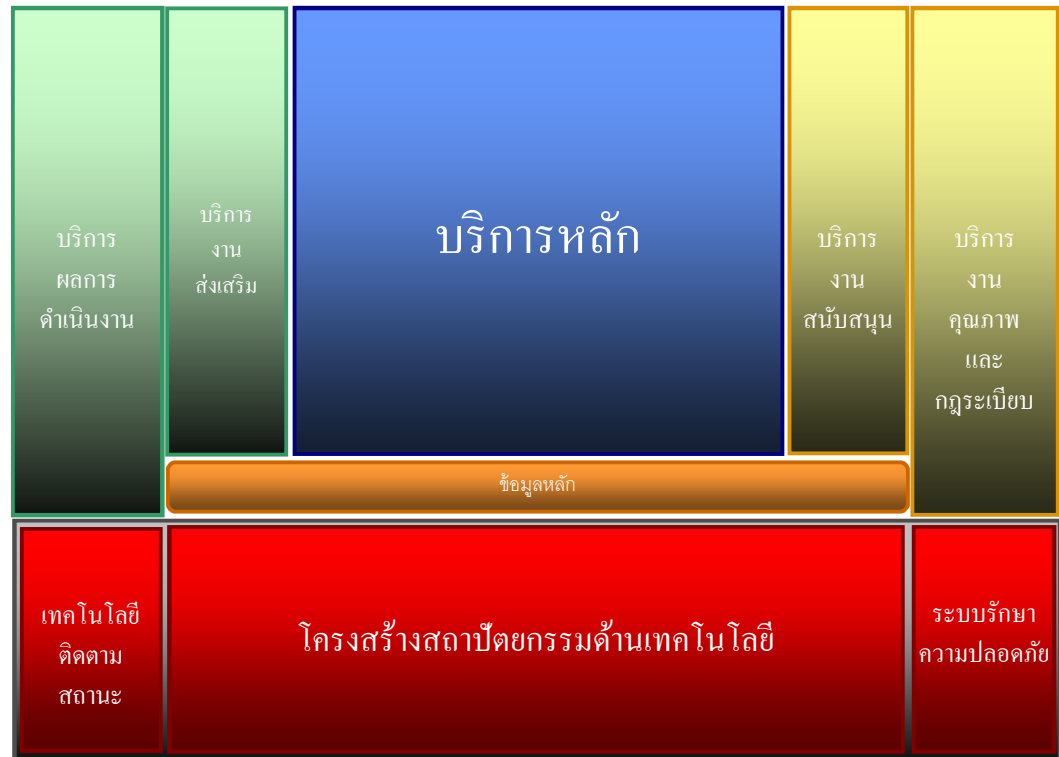
Mapping with Federal Enterprise Architecture



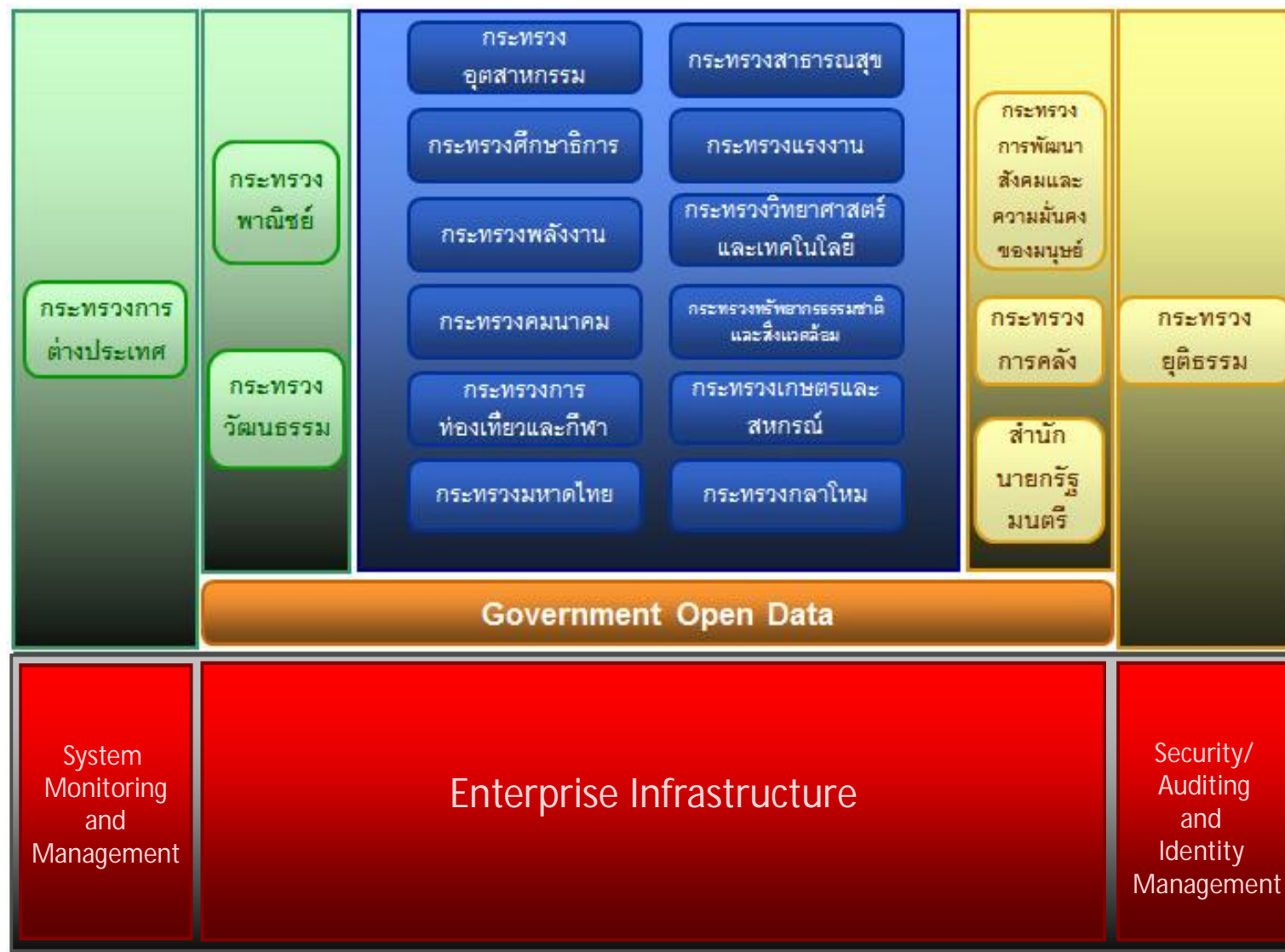
Enterprise Reference Model (ERM)

ERM ช่วยทำให้การมองภาพความสอดคล้องระหว่าง Business และ IT ในระดับ High Level เพื่อ:-

1. ช่วยทำให้การมอง IT จากภาพของธุรกิจ
2. ช่วยทำให้มองเห็นบริการและกระบวนการทำงานทางธุรกิจได้อย่างครอบคลุมและเป็นระบบ
3. ช่วยทำให้มองเห็นความสอดคล้องระหว่าง Business กับ IT ได้ในระดับ Strategic View
4. เป็นจุดเริ่มต้นของการทำรายละเอียดในระยะต่อไป

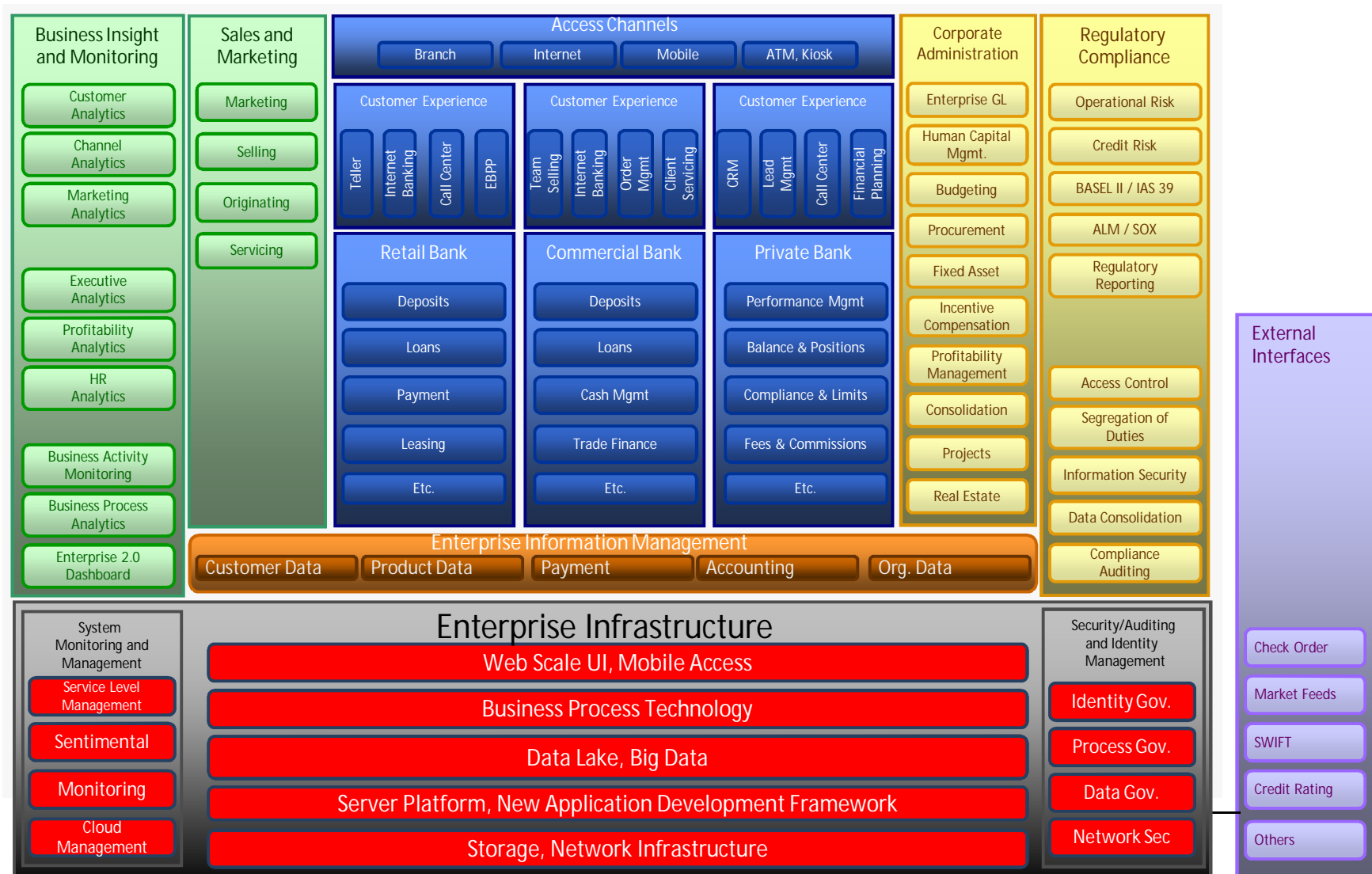


Government Reference Model

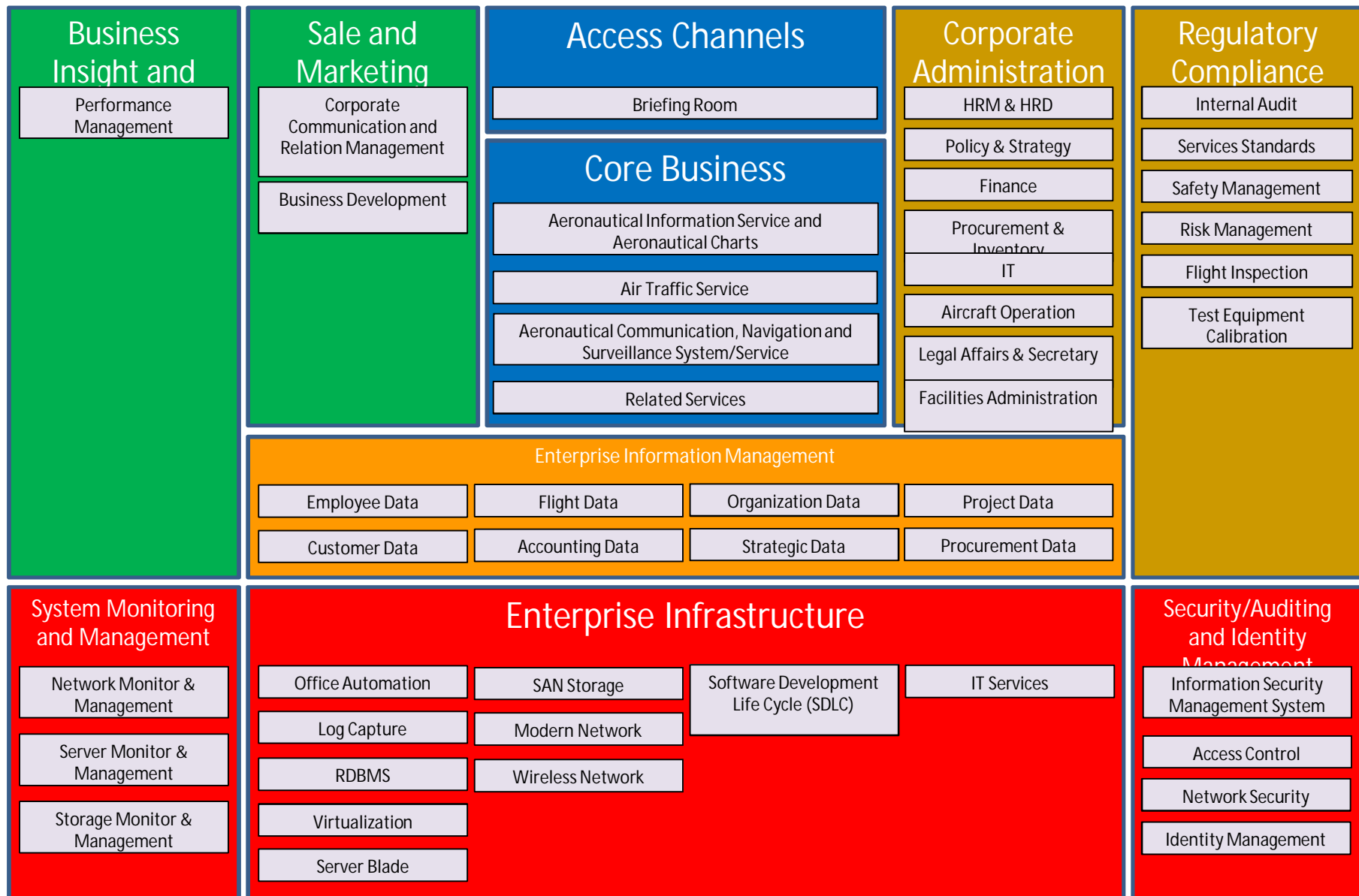


Banking Reference Model

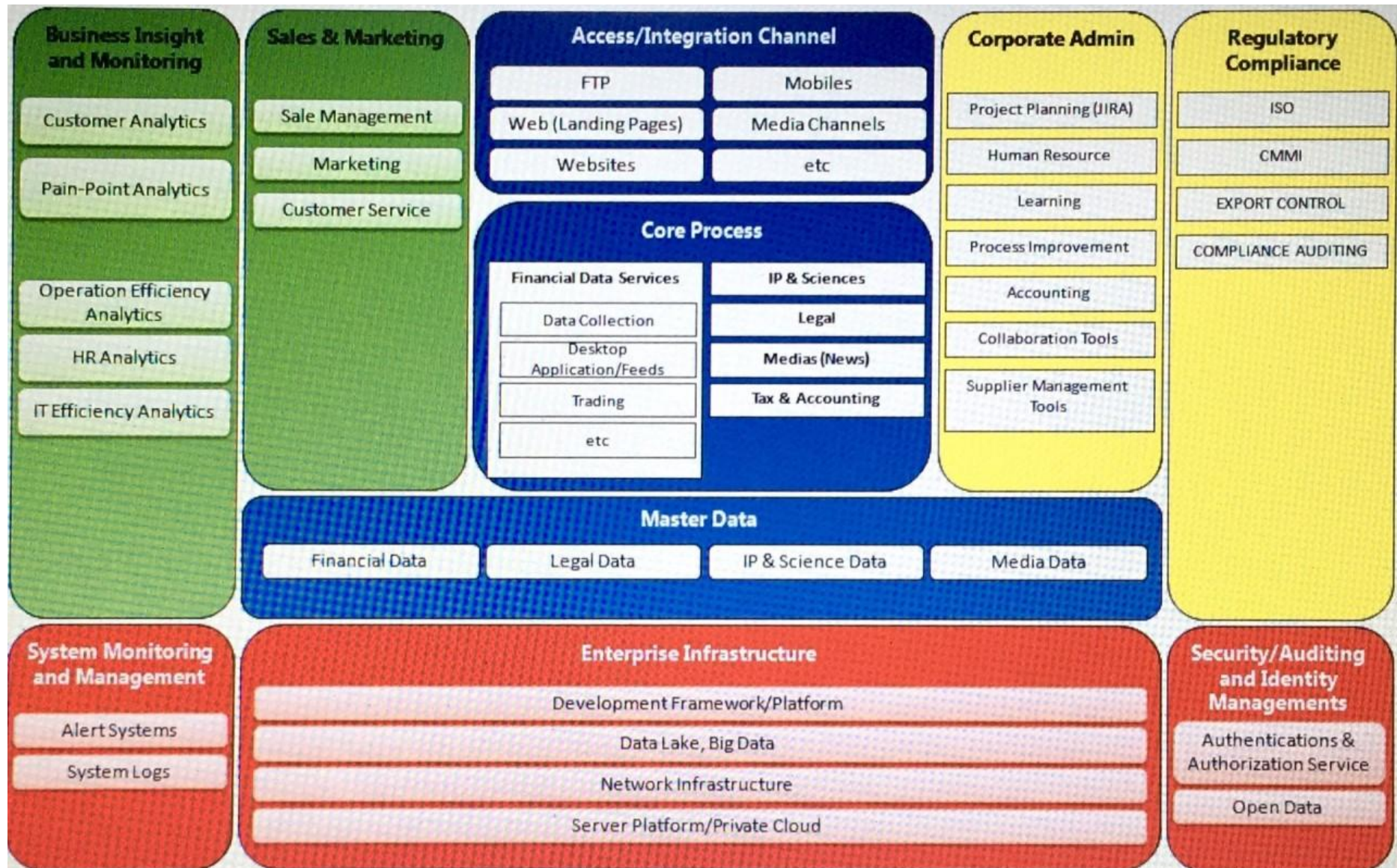
Agile, Secure and Standard Platform



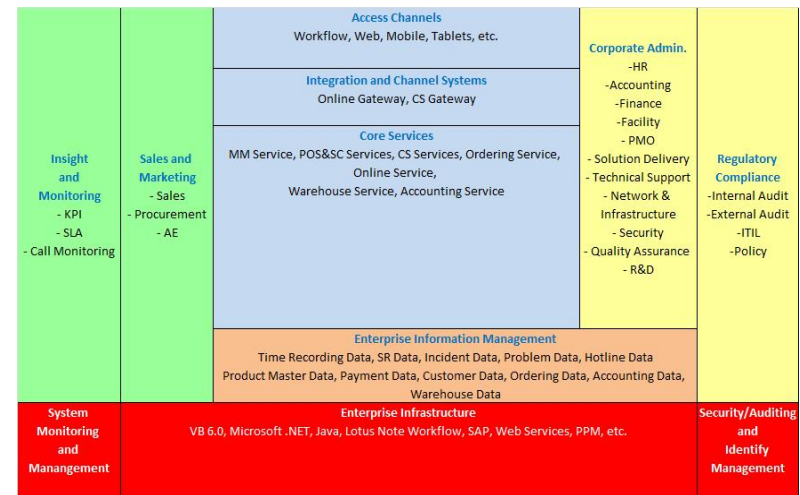
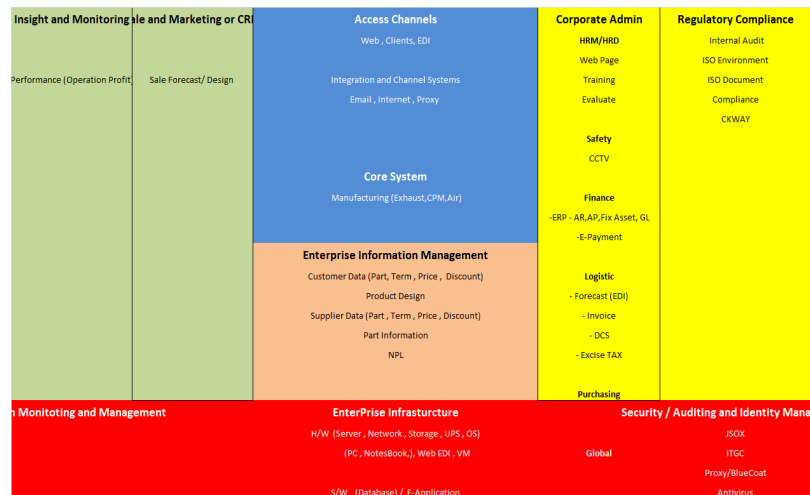
Sample Enterprise Reference Model



Sample Enterprise Reference Model



Sample Enterprise Reference Model



Sample Enterprise Reference Model

INSIGHT AND MONITORING - KPI - DASHBOARD	SALES AND MARKETING OR CITIZEN RELATIONSHIP MANAGEMENT - SALES - MARKETING	ACCESS CHANNELS WEB SITE MOBILE		CORPORATE ADMIN - HR - PURCUREMENT - ACCOUNTING - FINANCE - IT (SW / HW) - CPO - QA	REGULATORY COMPLIANCE - POLICY - ISM - ISO
		INTEGRATION AND CHANNEL SYSTEMS PROXY SERVICE			
		CORE SYSTEMS SALE ELEVATOR & ESLATOR & MAINTENANCE			
		ENTERPRISE INFORMATION MANAGEMENT EMPLOYEE DATA CUSTOMER DATA PRODUCT DATA PAYMENT DATA ACCOUNTING INVENTORY			
SYSTEM MONITORING AND MANAGEMENT	ENTERPRISE INFRASTRUCTURE				SECURITY / AUDITING AND IDENTITY MANAGEMENT PROXY
	USER CENTRICE (MOCKUP) PHP JSP VB.NET ASP.NET				
	PROCESS CENTRIC MICROSOFT VISIO				
	DATA CENTRIC WEBSERVICE				
	DECISION CENTRIC				
	H/W, STORAGE, OS, DATABASE, APPSERVER PLATFORM AS400, INFORMIX				

Market Share / Ranking	Retail / High Network E-Biz	Access Channels : Internet Trading / Mobile Trading	Corp Admin Finance Settlement Custodian IT Accounting	Compliance & Audit / Risk SEC / SET / BOT / AMLO Regulations
		Integration : SET / SETTrade / TSD / BSB / E - Banking		
		Core Services : Securities Brokerage (Equity & Derivatives)		
		Trading Account / Bank Account Equity / Derivatives / Mutual Fund Settlement Due Date / Clearing Due Date		
OpManager Cisco AAA	User : HiTrade / SBA / Sun Accounting / Efin+ / Straming Process : Front - DGW - Back Data : Trading Trasaction Historical / Commission Rate / CL Info Data : Web Service / FTP Decision : Trading Application (Credit Approval) / Decision : Credit Line Adjustment (Risk) / Decision : HR System HP OpenVMS / Linux / Windows / SQL / Informix VB / .NET / Java / VMWare			Credit / Margin Risk Control Active Directory Firewall / IPS Antivirus / Antispam

		Access Channels :web ,Computer Integration and Channel Systems:			
Insight and mornitoring	Sales Marketing or Citizen relationship management	Core system		Corporate	Regulatory compliance
performance: software monitor call center	PR เขียนหนังสือ call center	ฐานข้อมูลอาสาสมัคร ฐานข้อมูลผู้บริจาคเงิน ฐานข้อมูลผู้บริจาคดวงตา ฐานข้อมูลผู้บริจาคอวัยวะ		userหน่วยงานย่อย หนังสือขอดำเนินการ	KPI
		customerdata product data payment data accounting org. Hierarchy			
system Mornitorin	user Centric :PHP XAMPP				Security Auditing and Identity management
	Process Centric :PHP				
	Data Centric : Oracle				
	Decision Centric :				
	HW, Stroage, OS, Database, Appserver platform : San Storage				

Insight and Monitoring	Sales and Marketing	Access Channels	Corporate Admin	Regulatory Compliance
		- Website	- Procurement	- Internal Audit
		Integration and Channel Systems	- HR	- External Audit
		Web Gateway	- Accounting	- Policy
CRM		Core Systems	- Finance	
		ให้คำปรึกษาทางด้าน IT	- Network & Infrastructure	
		- Network & Infrastructure		
		- Business Visualization		
		- Strategic & Planning		
Enterprise Information Management				
	ข้อมูลลูกค้า	ข้อมูลโครงสร้างองค์กร	ข้อมูลพนักงาน	
	ข้อมูลธุรกิจคู่ค้า	ข้อมูลบัญชีการเงิน		
System Monitoring and Management	Enterprise Infrastructure			Security/ Auditing and Identity Management
	User Centric			
	Process Centric			
	Visio			
	Data Centric			
	Google Cloud			
	Decision Centric			
	H/W, Storage, OS, Database, AppServer Platform			
		File Server		

Sample Enterprise Reference Model

Insight and Monitoring	Sales and Marketing or CRM	Access Channel	Corporate admin	Regulatory Compliance
- Strategy - R&D	- Sales - Marketing	- Web Application Integration and Channel System - Gateway System Core System ผลิตและจำหน่าย นุหรีซึกกาเร็ด	- HR - Finance - Budget - Procurement - Accounting - IT	- Audit - Law - Policy
Enterprise Information Management - ข้อมูลการรับซื้อโนยา / - ข้อมูล Stock โนยา / - ข้อมูลเครื่องจักร / - ข้อมูลอะไหล่ - ข้อมูล Stock นุหรี / - ข้อมูลลูกค้า / - ข้อมูลการขาย / - ข้อมูลบัญชี				
System Monitoring and Management - CRM Application - Data Warehouse Application - Sale Application	Enterprise Infrastructure User Centric - ERP App Process Centric Data Centric - MySQL Database Decision Centric H/W, Storage, OS, DB, AppServer Platform VM Ware Server/San Storage/Network			Security/Auditing and Identity Management - Org. Policy - Law - Internal Audit System - KPI Application

Insight and monitoring	Sales and marketing	Access channels	Corporate Admin	Regulatory Compliance
	Sales	Web, PC	HR	ICAO
		Integration and Channel Systems	SE	MOI
		Gateway	Supporter	Passport Trusting
		Core System	Helpdesk	
	Passport	Front User		
	Passport Queue Booking	Research		
	Enterprise Information Management			
	Booking data, HR data, Passport Data, Biometric data,			
System monitoring and Management	Enterprise Infrastructure			Security/Auditing and identiy management
	HTML5, Mobile, Java, .Net,			AD
	Web service			
	Glassfish			
	Oracle			
	AQ			

<u>Insight and Monitoring</u> - Requirement - Application Issue/Report - Performance Issue/Report	<u>Sale and Marketing or CRM</u> - Pre sale - Customer account	<u>Access Channels</u> - Telephone - Email - Issue form - Direct Mobile (Optional)	<u>Corporate Admin.</u> - HR - Accounting - Finance - Unit Head (SE/DEV)	<u>Regulatory Compliance</u> - SLA - CMMI - LAW - Policy
		Integration and Channel Systems - Operation center - System Engineer (Optional) - Developer		
		Core Systems - MA service		
		<u>Enterprise Information Management</u> - Customer data - Project/Product data - Issue/Incident data - Payment data - Accounting - Responsibility owner		
	<u>Enterprise Infrastructure</u> JIRA web application (User/Process/Data/Decision), MA service form system (MA Report) INET cloud, ***OS, Database, AppServer Platform Unknown***			
ITS department				User Identity Management User Authorization Firewall VPN

Insight and Monitor - KPI งานประกันคุณภาพ - KPI Action Plan - การประเมินผลการปฏิบัติงานประจำปีรายบุคคล	Sales and Marketing Or CRM - งานบริการวิชาการ	Access Channels - Web, Tablet, Mobile, Internet Access	Corporate Admin. - HR - procurement	Regulatory Compliance - Internal Audit - สอจ. - ISO - นโยบายมหาวิทยาลัย - ระเบียบมหาวิทยาลัย - ระบบประกันคุณภาพการศึกษา - การบริหารความเสี่ยง
		Integration and Channel Systems - ระบบใน Core System ใช้ฐานข้อมูลร่วมกัน - Export/Import Data ผ่านระบบ		
		Core System - GL3D System (Budgeting, Finance, Procurement & Asset, Accounting) - Student Admission System (รับสมัครและประมวลผลสอบคัดเลือก) - Student Registration System (นักศึกษา, ตารางสอน ตารางสอบ, ลงทะเบียน, ส่งเกรด) - Personal Information System (ระบบบุคลากร)		
		Enterprise Information Management - Employee Data - Student Data - Procurement Data - Asset Control Data - Finance Data - Accounting Data		
		Enterprise Infrastructure - PHP, VB.NET, ASP.NET - Linux, Windows, Oracle, MySQL Ingres, IIS, Apache		
System Monitoring and Management - App: Oracle EM, Network Monitoring System - Manual detection (Log, etc.)				Security/Auditing and Identity Management - Antivirus - Web App Firewall - AD Authentication

Group Workshop - The Current State Enterprise Reference Model

Write down your
existing enterprise architecture
foot print

Team Name: xxx

1. Name, Company, E-mail 3. Name, Company, E-mail
2. Name, Company, E-mail 4. Name, Company, E-mail

Enterprise Reference Model

บริการ ผลการ ดำเนินงาน	บริการ งาน ส่งเสริม	บริการหลัก	บริการ งาน สนับสนุน	บริการ งาน คุณภาพ และ กฎระเบียบ
		ข้อมูลหลัก		
เทคโนโลยี ติดตาม สถานะ	โครงสร้างสถาปัตยกรรมด้านเทคโนโลยี			ระบบรักษา ความปลอดภัย

Business Service Analysis Worksheet

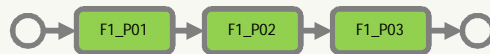
Service Name: _____

Service Owner: _____

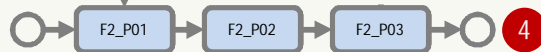
Version: _____ Date/Time: _____

Key Objectives: 1. _____
2. _____
3. _____
4. _____

Business
Function1



Business
Function2



Business
Function3



Business Check Points, Information

1. _____, _____
2. _____, _____
3. _____, _____
4. _____, _____
5. _____, _____

Key Business Issues: _____

Key Technology Issues: _____

Enterprise Repository

Owner: Business Units

Business Objectives Worksheet

Version: ____ Date: ____

#	Business Goals	Business Services	Business Objectives	Owner	Business Processes	Remarks

Business Processes Worksheet

Version: ____ Date: ____

#	Business Process Name	Owner	Strategic Business Process (Y/N)	Main Service Description	High Level Business Process (Please attach up-to-date document)	Expected Transaction Complete Duration (hr,day,week)	Actual Transaction Complete Duration (hr,day,week)	Total of Transaction / (hr, day, month)	% of Transaction Duration done by automated system	Supported by Application(s)	Current Issues	Remarks

Enterprise Repository

Owner: Technology Unit

Applications/Touch Points Worksheet

Version: ____ Date: _____

#	Applications / Touch Points Name	Owner	Activity Flow (please attach up-to-date document)	Integration to which systems (online/batch)	Major Data Required	Current Issues	Remarks

Owner: Business Unit with supported by Technology Unit

Data Worksheet

Version: ____ Date: _____

#	Data Name	Owner	Description	Change Control of data (Y/N)	Structure/ Unstructure	Data Type (DB, JSON, XML, Sound, Image, VDO, etc.)	Current Issues	Ramarks

Enterprise Repository

Owner: Technology Units

Technology Worksheet

Version: ____ Date: _____

#	Applications / Touch Points / Database / Data Store Name	Total Connections	Concurrent Connections	Required Response Time (sec.)	Actual Response Time (sec.)	Development Software Languages / Framework (for App)	Package / In-House (for App)	Private / Public / Hybrid Cloud	OS / Platform (Windows, Linux, Docker, etc.)	Monitoring Tool Name	Sign On / Security System Name	% growth / year	Initial Cost (Baht)	M.A. Cost /year (Baht)	Remarks

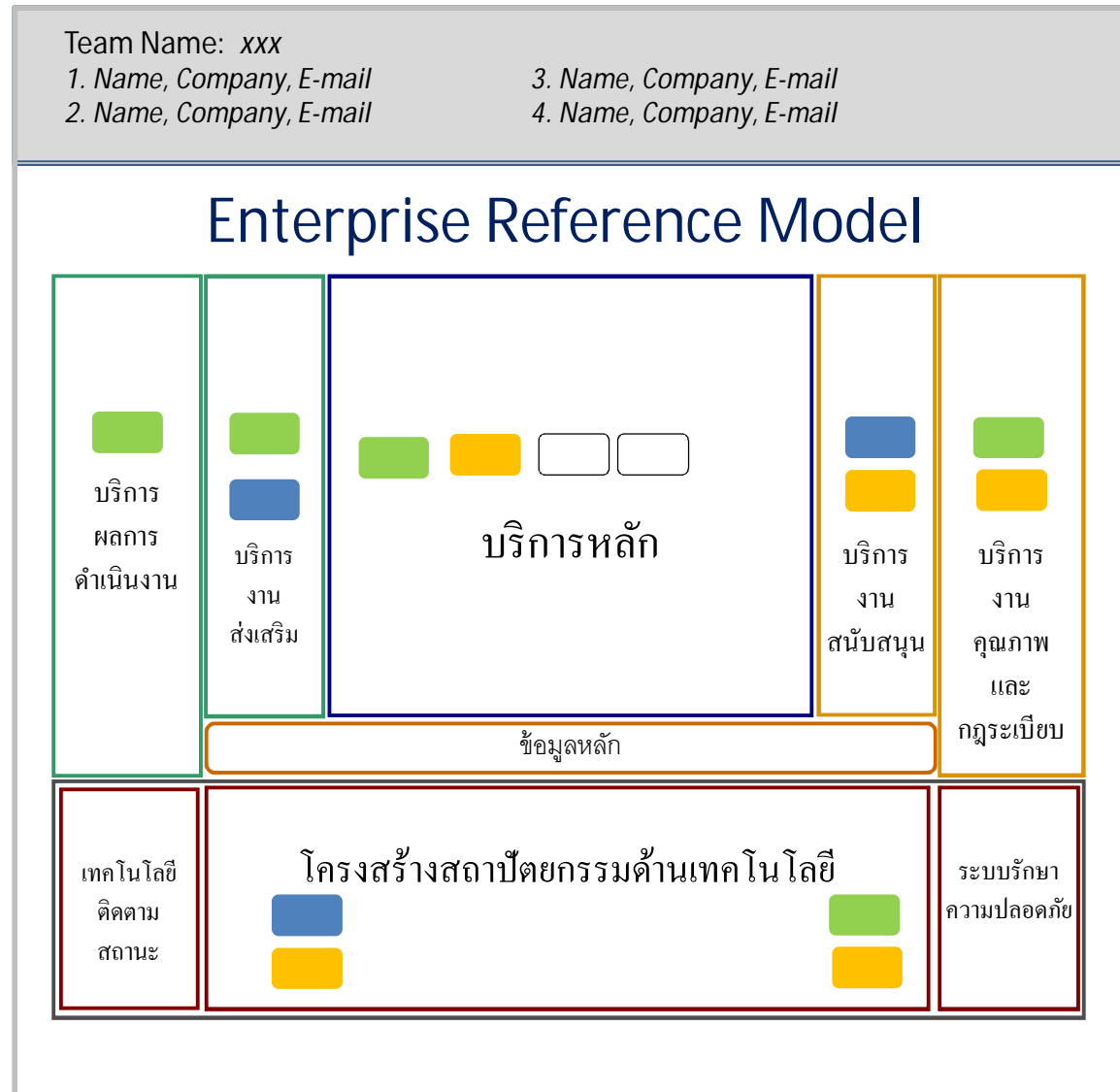
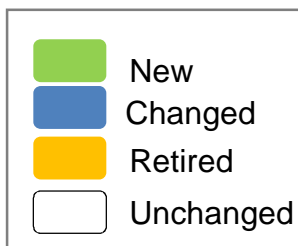
- #
- Applications / Touch Points / Database / Data Store Name
- Total Connections
- Concurrent Connections
- Required Response Time (sec.)
- Actual Response Time (sec.)
- Development Software Languages / Framework (for App)
- Package / In-House (for App)

- Private / Public / Hybrid Cloud
- OS / Platform (Windows, Linux, Docker, etc.)
- Monitoring Tool Name
- Sign On / Security System Name
- % growth / year
- Initial Cost(Baht)
- M.A. Cost /year (Baht)
- Remarks

Group Workshop - Enterprise Reference Model

The Future State

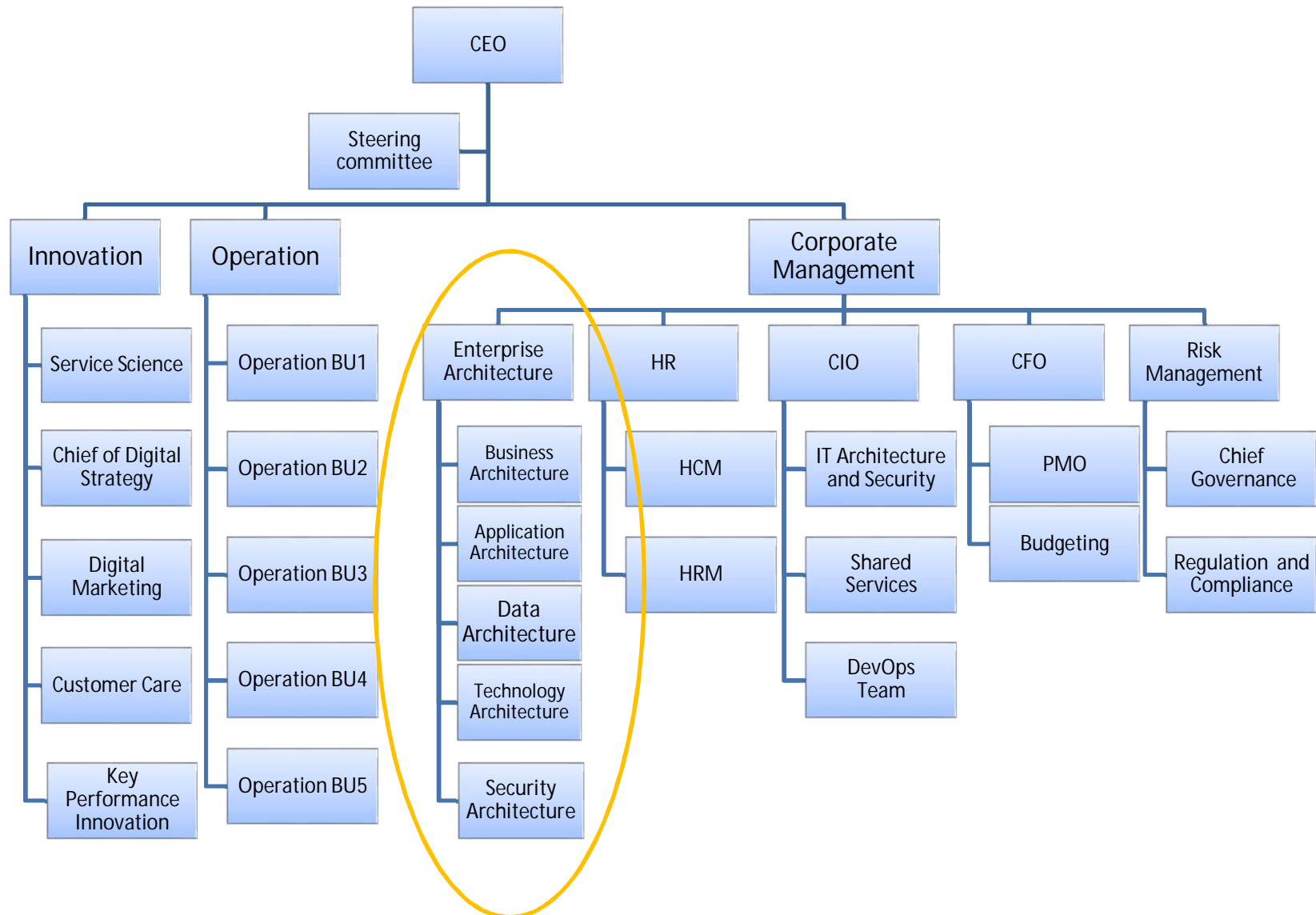
15 mins.
presentation



Key Deliverables from Enterprise Architecture

Deliverables	Description
1. EA Reference Model	Describe the dependency between business and IT
2. EA Repository	Enterprise assets inventory with the components relationships for change impact analysis
3. IT Configuration Model for better problem solving	Diagrams and artifacts for the system problem solving with traceability
4. Business Transitioning Roadmap	The transitioning phase for EA capability improvement
5. EA Governance framework	Sustainable framework for digital business growth

Digital Organization Chart



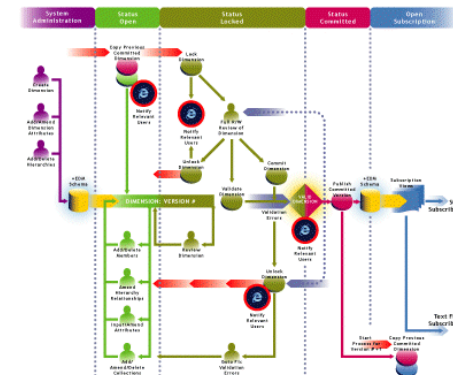
Business Architecture

Business Process Management

Business Process Management

Business process management (BPM) is a management approach focused on **aligning all aspects of an organization**.

It promotes business effectiveness and efficiency while striving for innovation, flexibility, and integration with technology.



EA and BPM

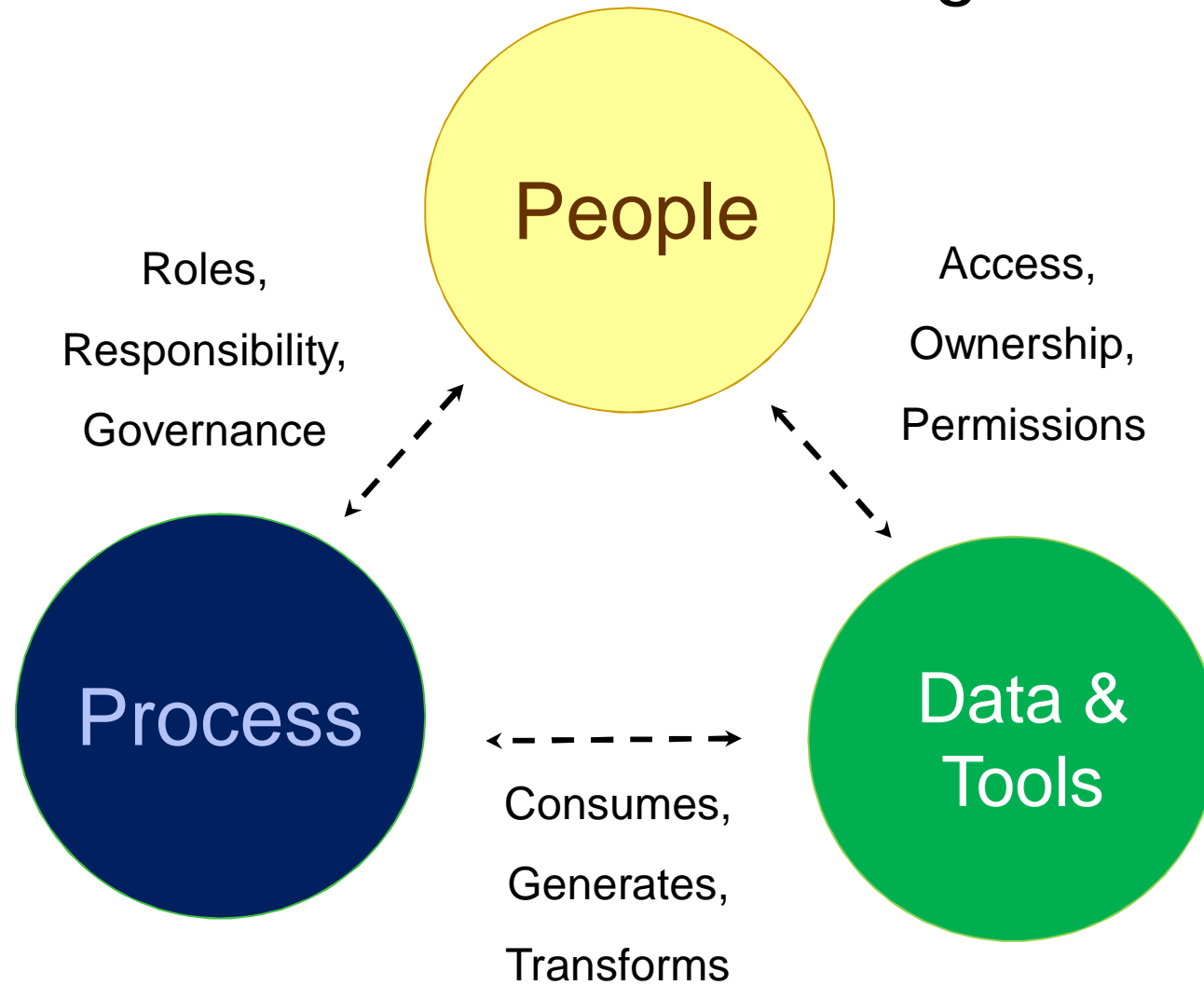
EA Goals

- Enterprise planning
 - Describe current and future state of the structure of an enterprise
- Business-IT alignment
 - Links between business/technology artefacts
 - Business visibility and measurement
- Change-friendly capability delivery
 - Adaptable and agile for continuous change

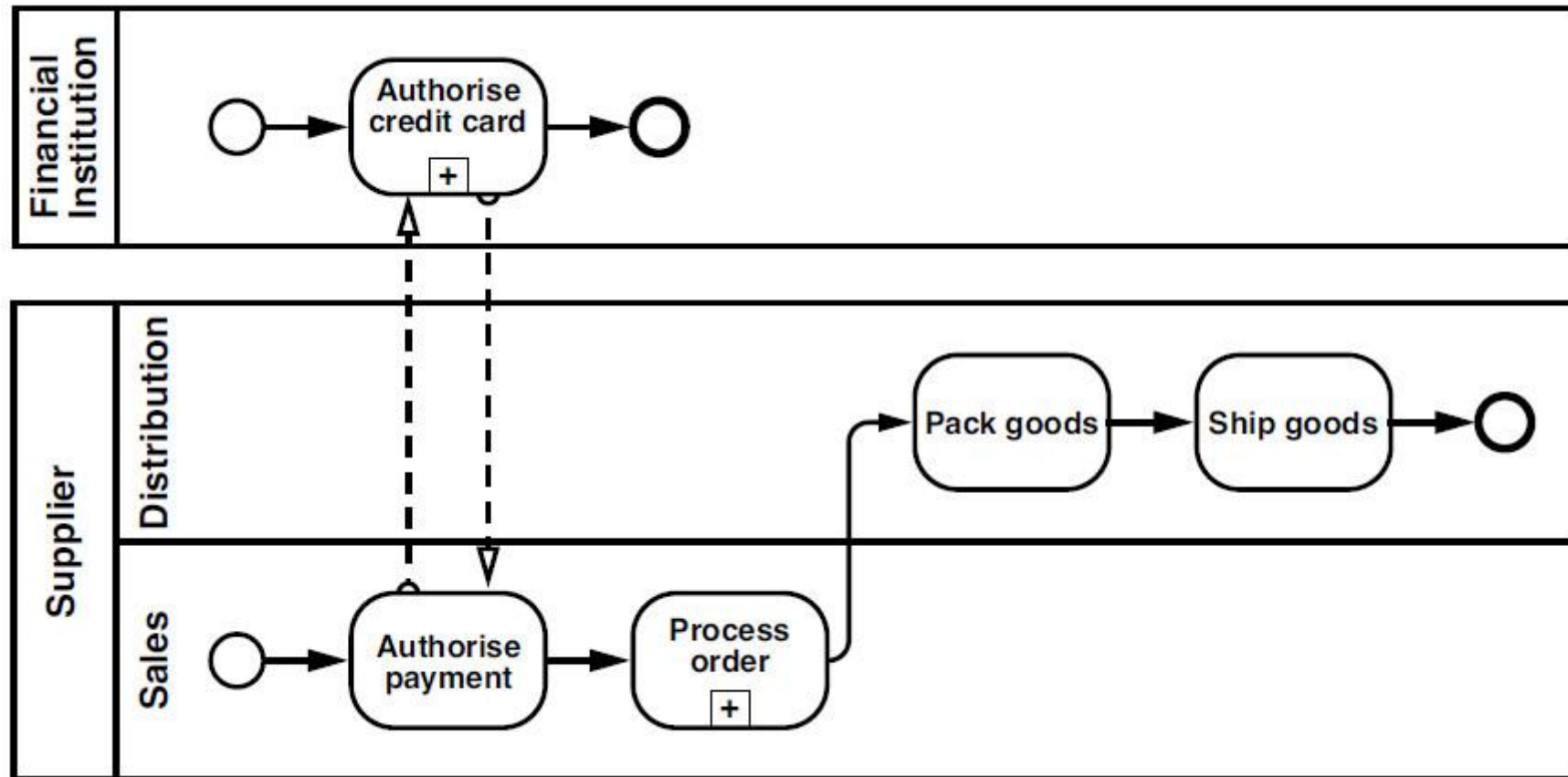
BPM Goals

- Efficiency
 - Automating steps and handoffs
 - Integrating systems and data sources
- Compliance
 - Achieving and proving standardization
- Agility
 - Changing processes quickly and easily
- Visibility
 - See what's happening in a process

Business Process Management

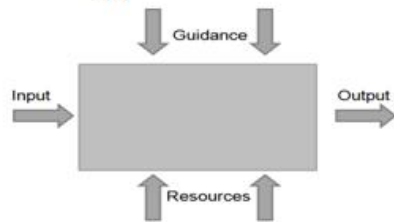


Example Cases: Sales Process

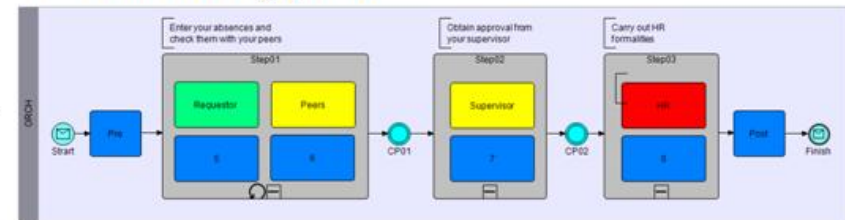


Four phases of Business Process Development

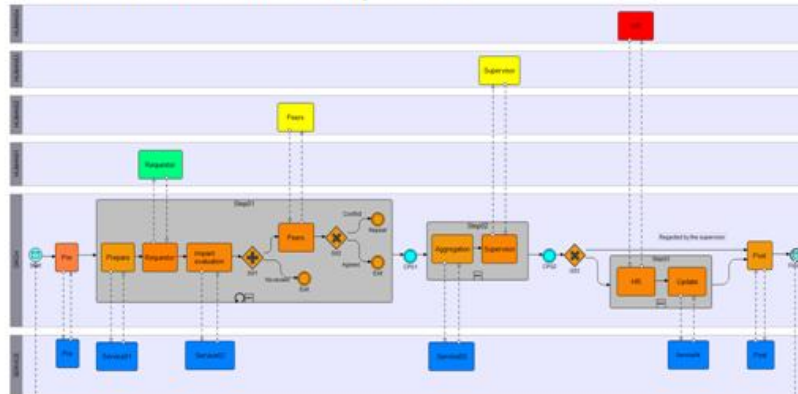
1. Blackboxing phase



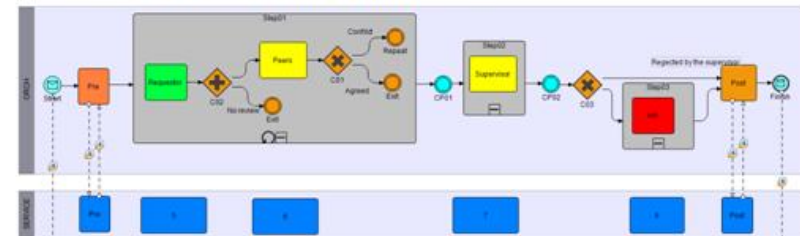
2. Structuring phase



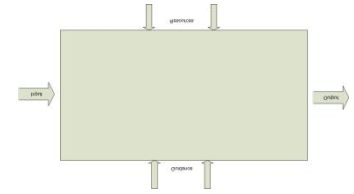
4. Instrumentation phase



3. Re-construction phase

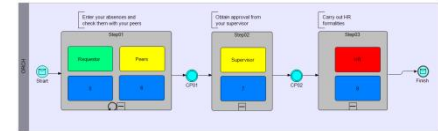


Blackboxing phase

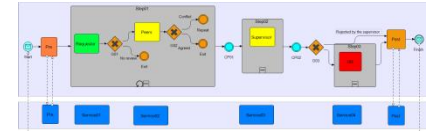


- The purpose
 - to analyse a building block as a whole
 - to discover its functional characteristics and some related artefacts
- The method
 - the business story behind this building block should be carefully analysed to determine some of its artefacts
- Recommendations
 - at this point, don't go into excessive detail for each artefact; this should be done later

Structuring phase (1)



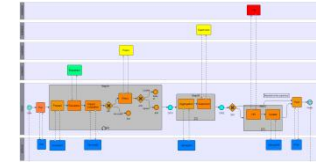
- The purpose
 - to analyse a building block from within to determine its internal structure and its major artefacts
- The method
 - determine the main functional (or logical) steps
 - add check-points between steps
 - classify artefacts for these steps
- Recommendations
 - don't have more than 7 steps
 - avoid loop-back over check-points



Re-construction phase (1)

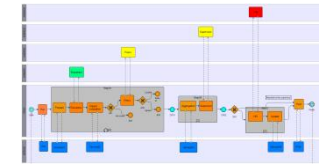
- The purpose
 - to synthesize an initial version of the formal coordination: some kind of process skeleton
- The method
 - add intra-step logic
 - start formalising the business objects involved
 - collect test scenarios
- Recommendations
 - consider implementation of human activities as interactive forms

Instrumentation phase (1)

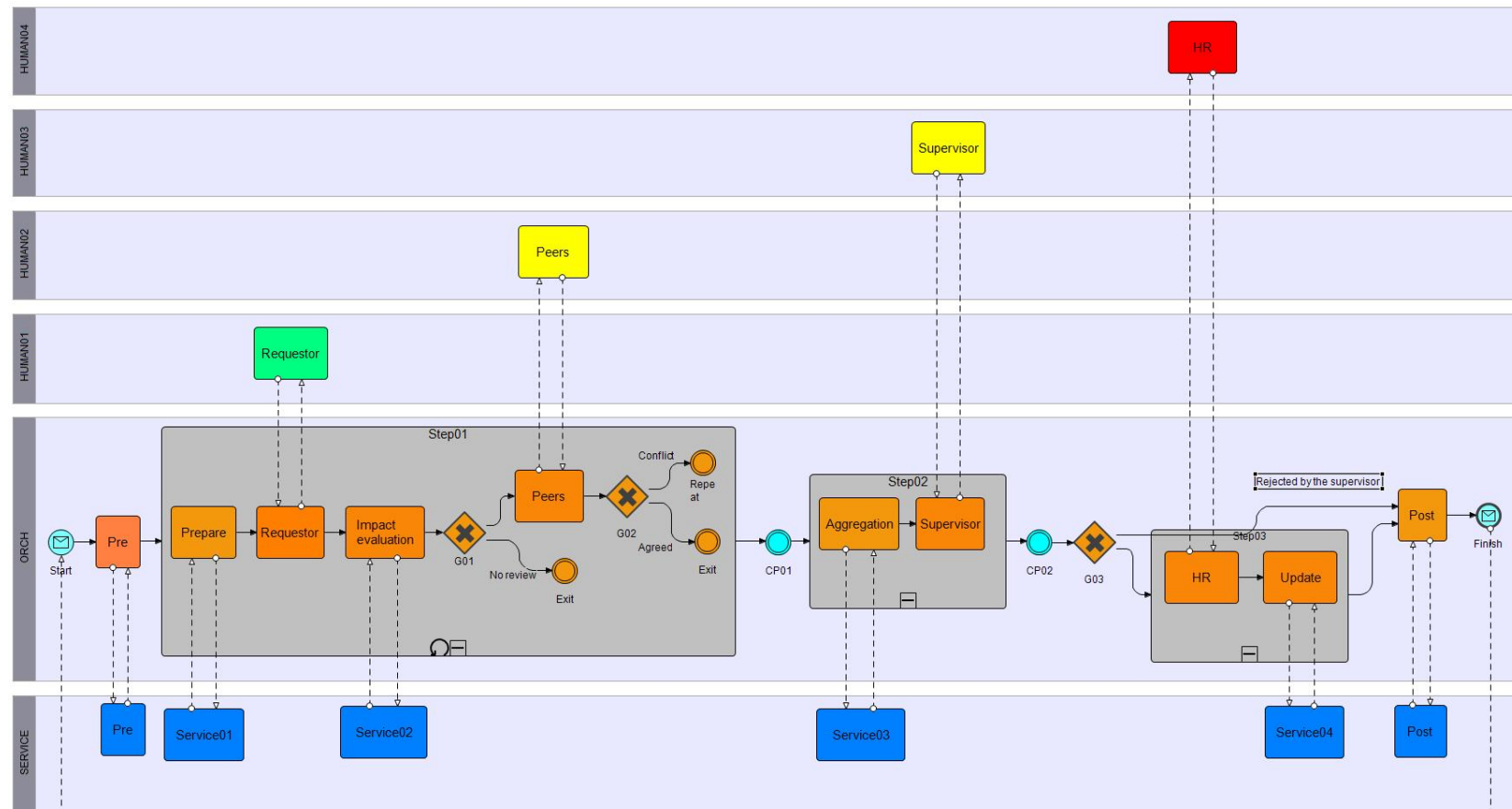


- The purpose
 - to enrich the process skeleton by adding more automated activities
- The method
 - add pools
 - apply different practical patterns
 - use a business rule engine if available
 - collect test scenarios
- Recommendations
 - work iteratively (step-by-step)

Instrumentation phase (2)

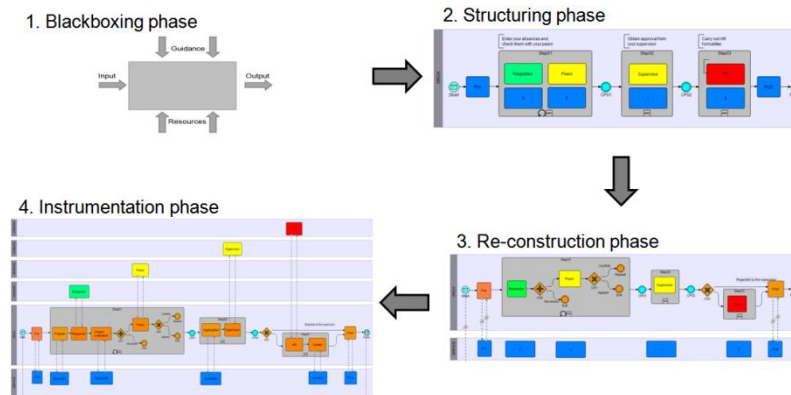


- The diagram



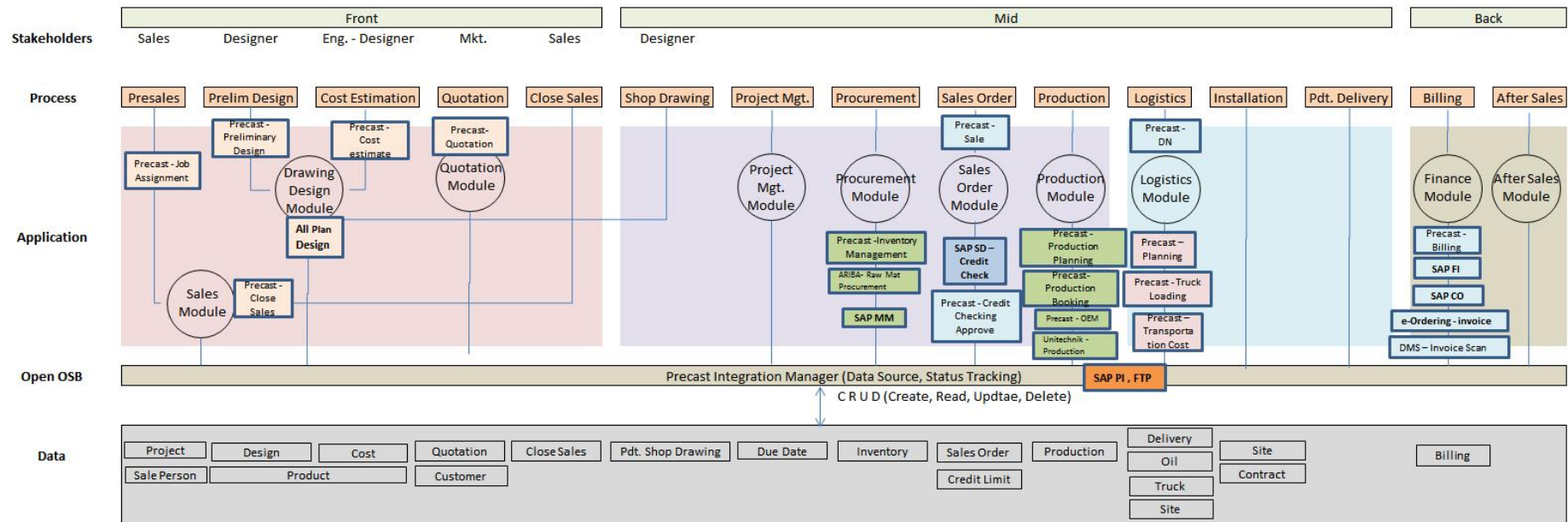
Group Workshop: Business Process Modeling

Writing BPMN



1. Introducing Group Members
2. Giving Process Name and Descriptions
3. BPMN Phase 1: Block Boxing Phase
4. BPMN Phase 2: Structuring Phase
5. BPMN Phase 3: Re-Construction Phase
6. BPMN Phase 4: Instrument Phase

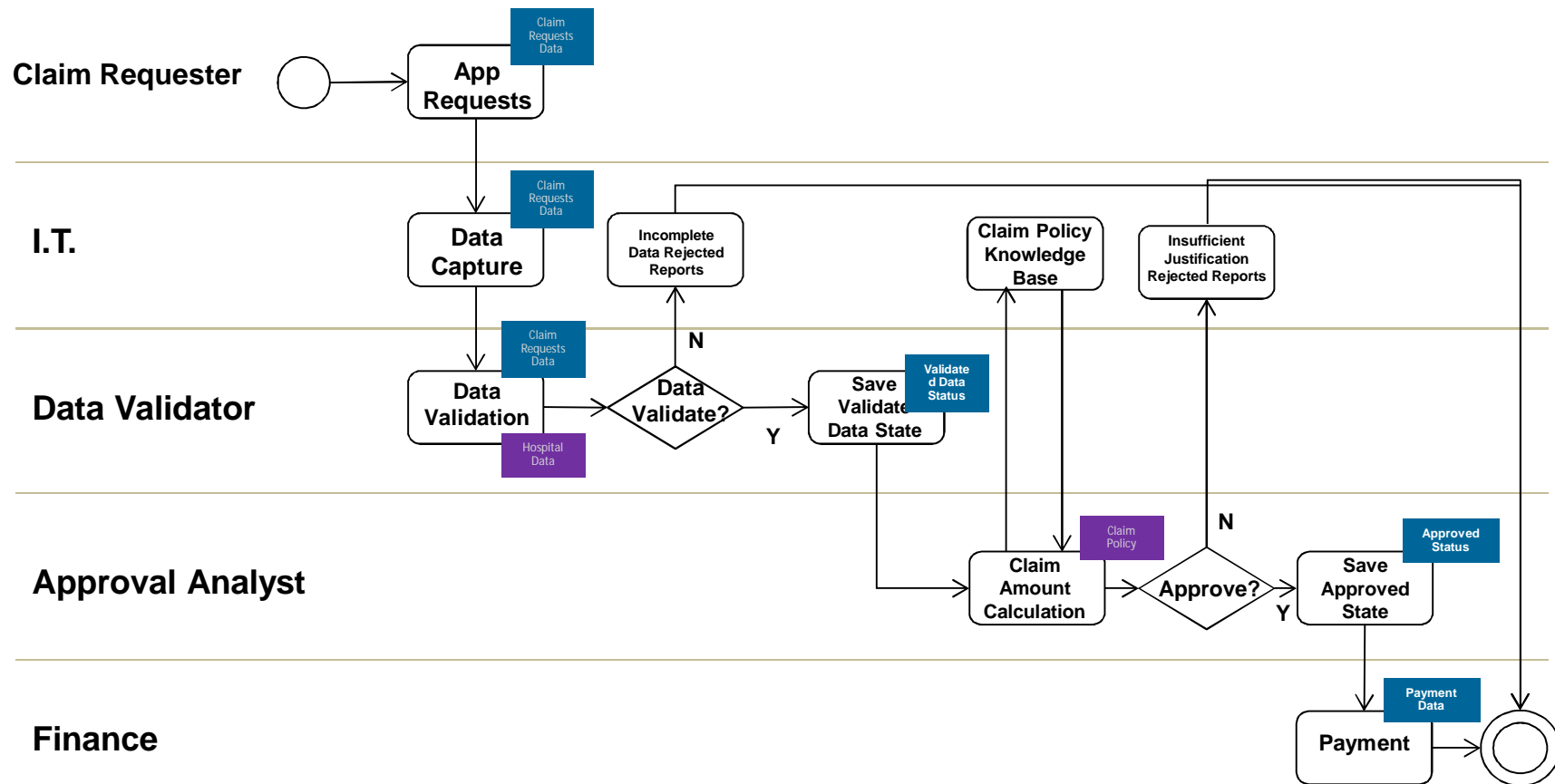
Sample: Business Process Consolidation



การปรับปรุงด้าน Business Process

Sample Case: Request Approval Process

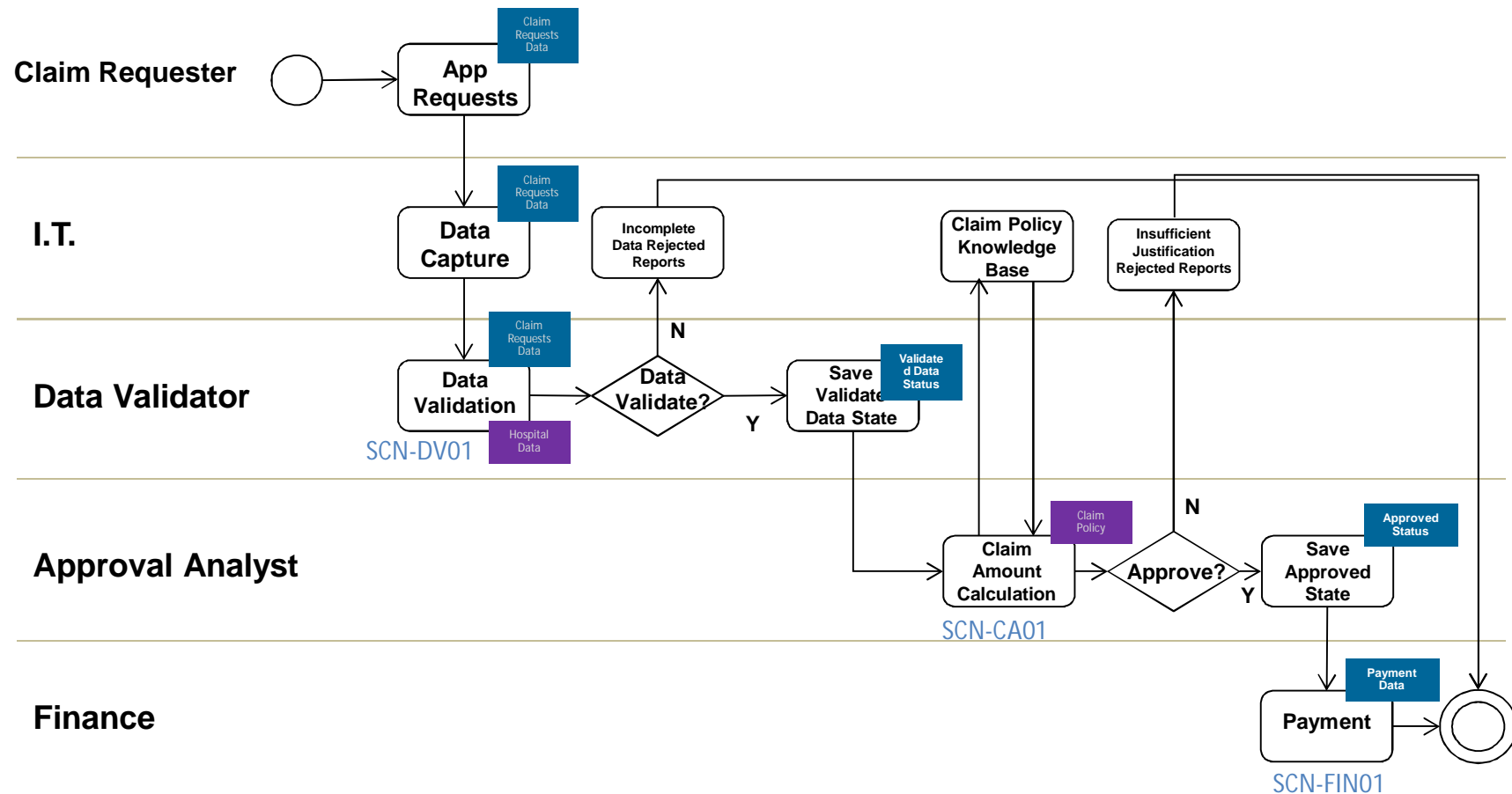
1. Complete End-to-end Business Process Level-3 with Data In and Out of each activity



การปรับปรุงด้าน Business Process

Sample Case: Request Approval Process

2. Tag Screen ID to the activities which required user interaction



การปรับปรุงด้าน Business Process

Sample Case: Request Approval Process

3. Build All User Interaction Screens

3.1. หน้าจอของ Data Validator

Data Received Date: 15-May-14		Branch ID: CHOL-0003		
Data Validation User: dvuser001		SCN-DV01		
Claim Date	Short Desc	Amount	Details	Select
12-May-14	xxxxxxxxx	5,000	Details	<input type="checkbox"/>
12-May-14	xxxxxxxxx	80,000	Details	<input type="checkbox"/>
14-May-14	xxxxxxxxx	120,000	Details	<input type="checkbox"/>
14-May-14	xxxxxxxxx	12,000	Details	<input type="checkbox"/>
14-May-14	xxxxxxxxx	24,000	Details	<input type="checkbox"/>
<div>Reject Submit</div>				

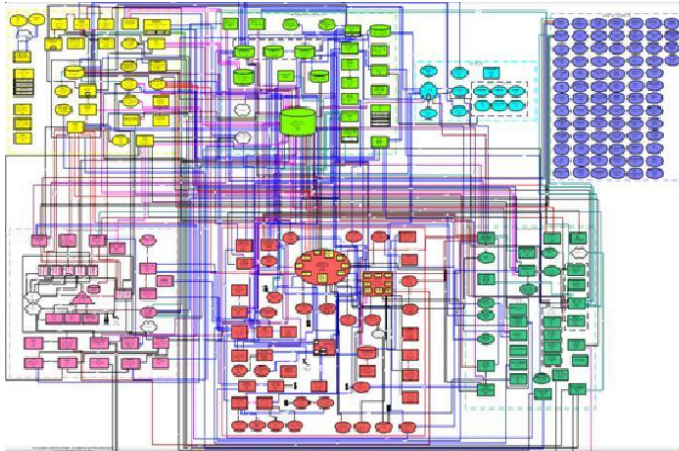


3.2. หน้าจอของ Approval Analyst

Data Received Date: 15-May-14		Branch ID: CHOL-0003		
Claim Analyst User: causer001		SCN-CA01		
Claim Date	Short Desc	Amount	Details	Select
12-May-14	xxxxxxxxx	80,000	Details	<input type="checkbox"/>
14-May-14	xxxxxxxxx	120,000	Details	<input type="checkbox"/>
<div>Reject Submit</div>				

การปรับปรุงด้าน Business Process

Current and Target State

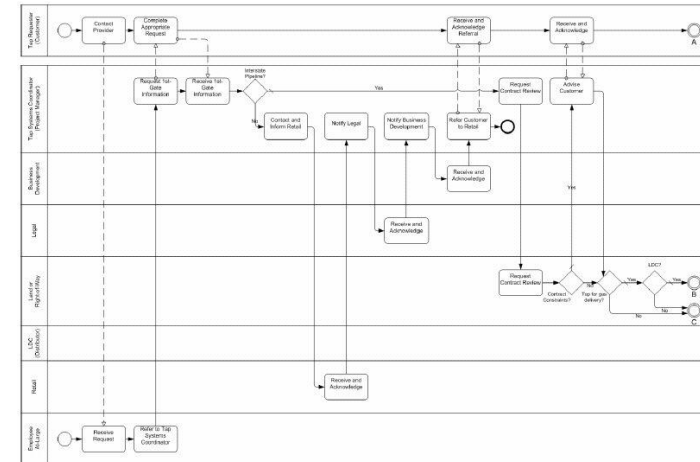
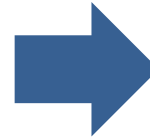
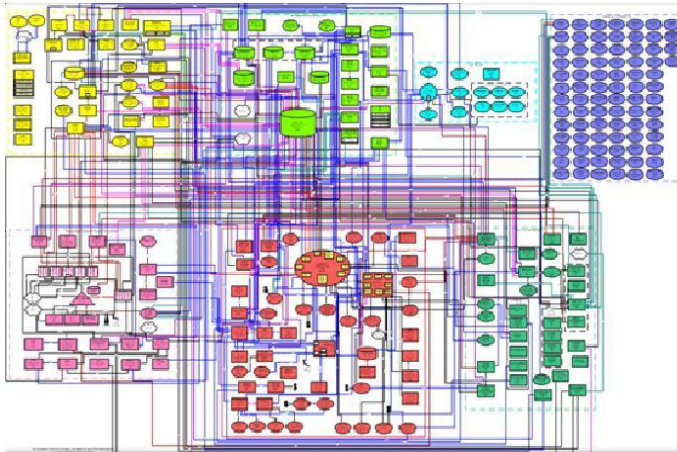


Current

- Too many redundancy processes
- Delay response for new services
- Create cost of maintenance
- Create business Risk

การปรับปรุงด้าน Business Process

Current and Target State



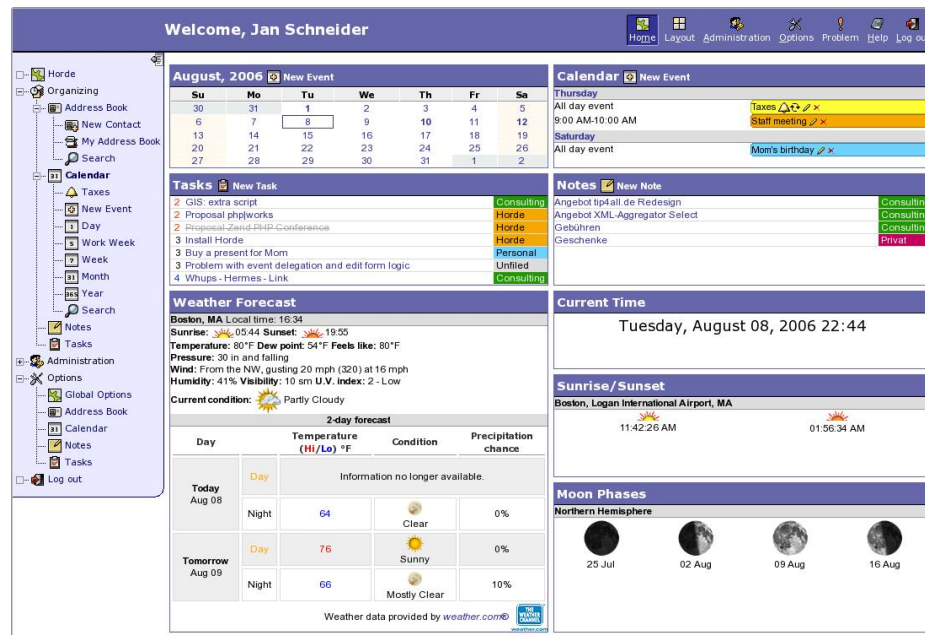
Current

- Too many redundancy processes
- Delay response for new services
- Create cost of maintenance
- Create business Risk

Target

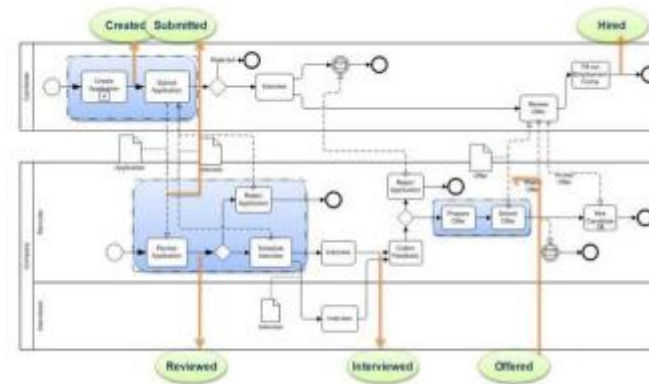
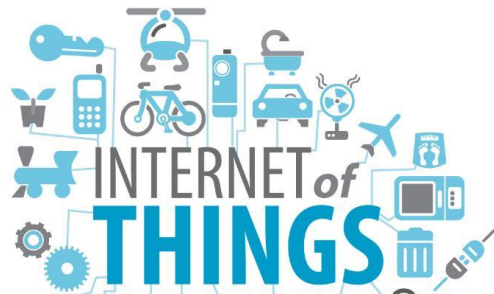
- Better productivity
- Flexibility and design to change
- Reduce cost of maintenance
- Reduce business risk

Application and Automation



- BPM Application
- Portals or intranets
- Social Integrated Event Capturing
- Business Rules Engine
- Network drives where you can store shared documents
- Email and the capability to design forms
- Text messaging

IoT and Social Network Integration

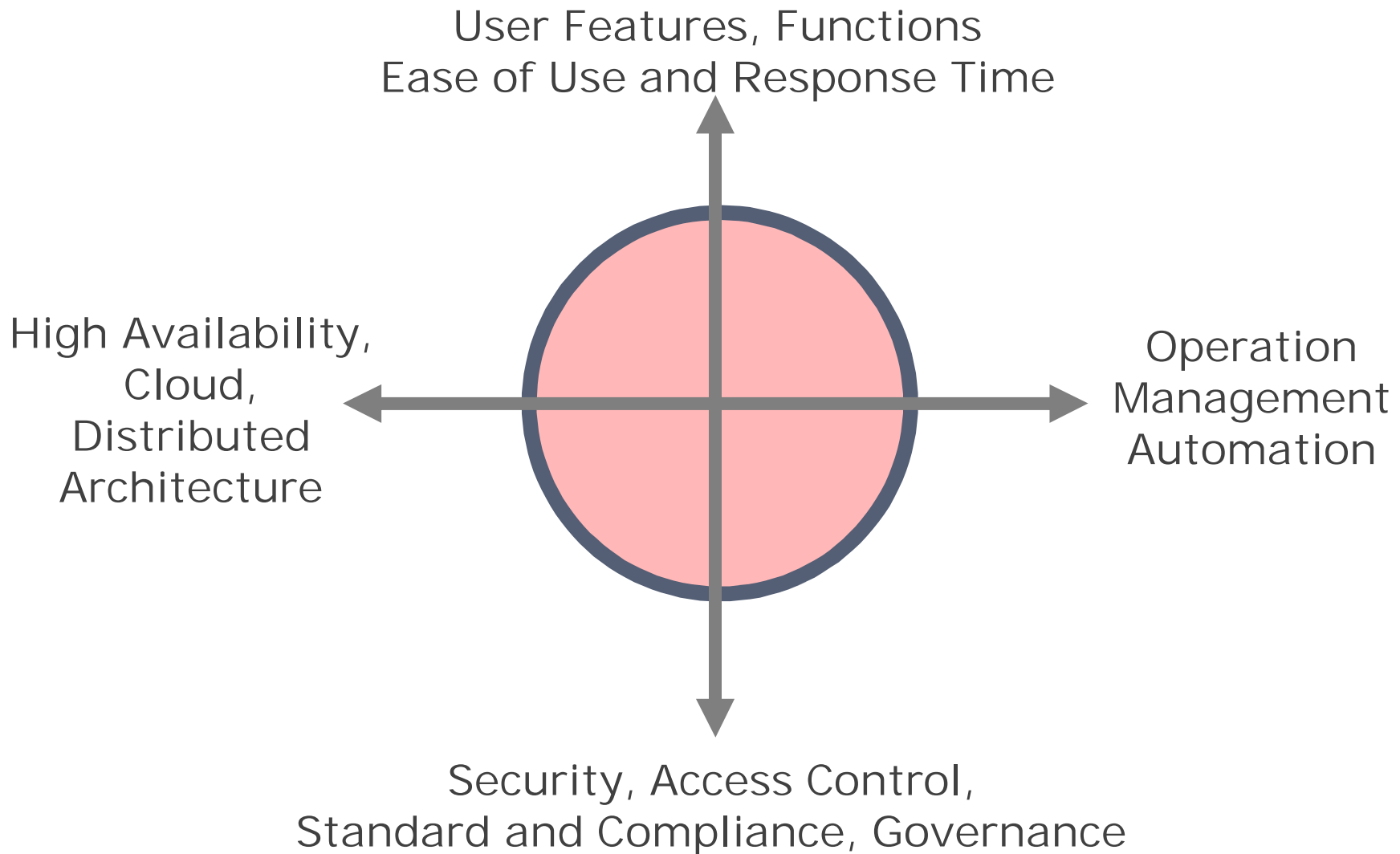


- Enrich customer profile
- Improve customer relationship
- Improve business rules and approval conditions
- Create Innovation
- Enhance operational transparency

Michael Moyal, Blue Corw, 2008

Practical Application Architecture

Design Principles



Application Development Framework

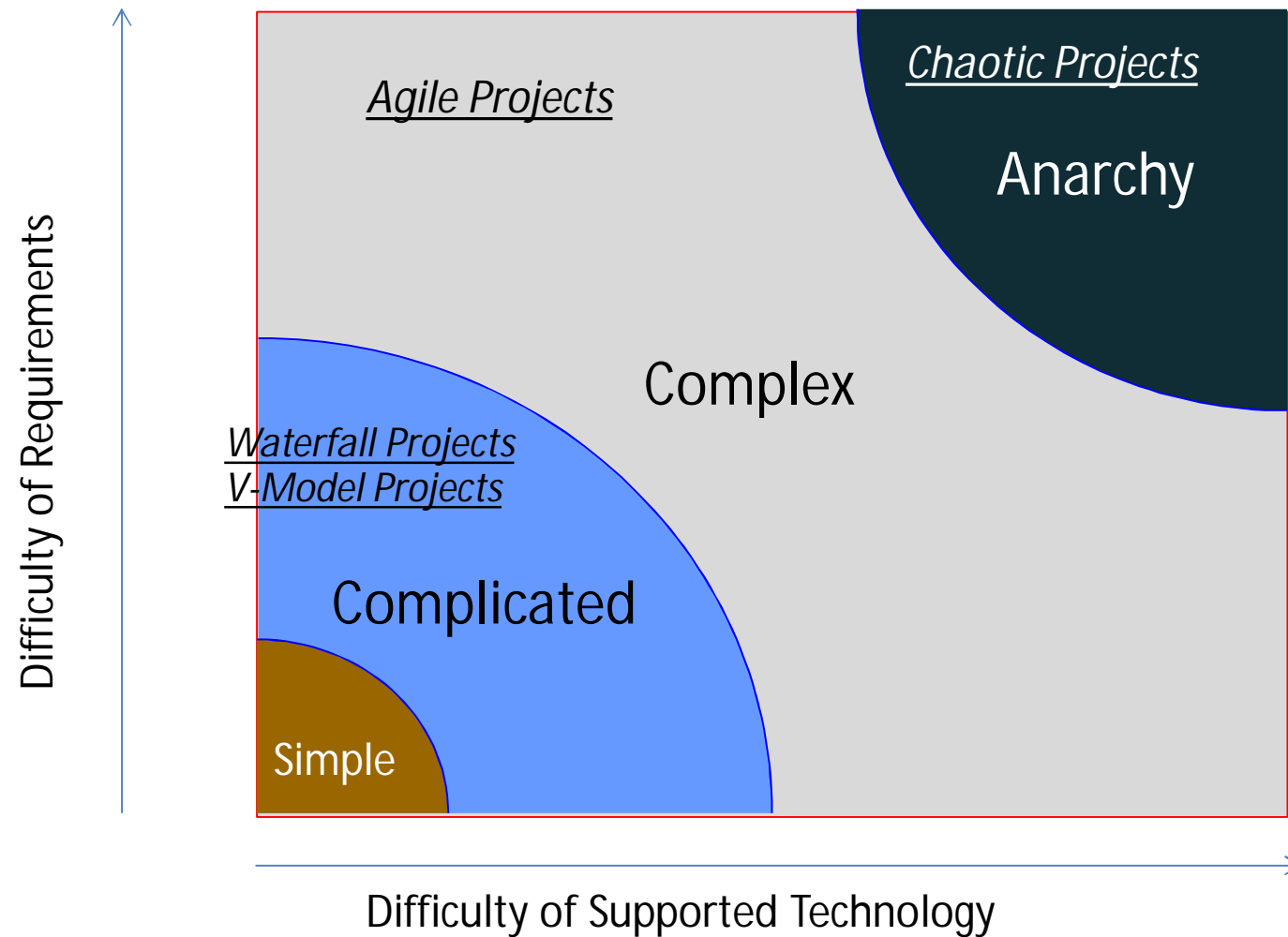
An application framework
represents the **partial
implementation of a specific area
of an application**

Packaged Application

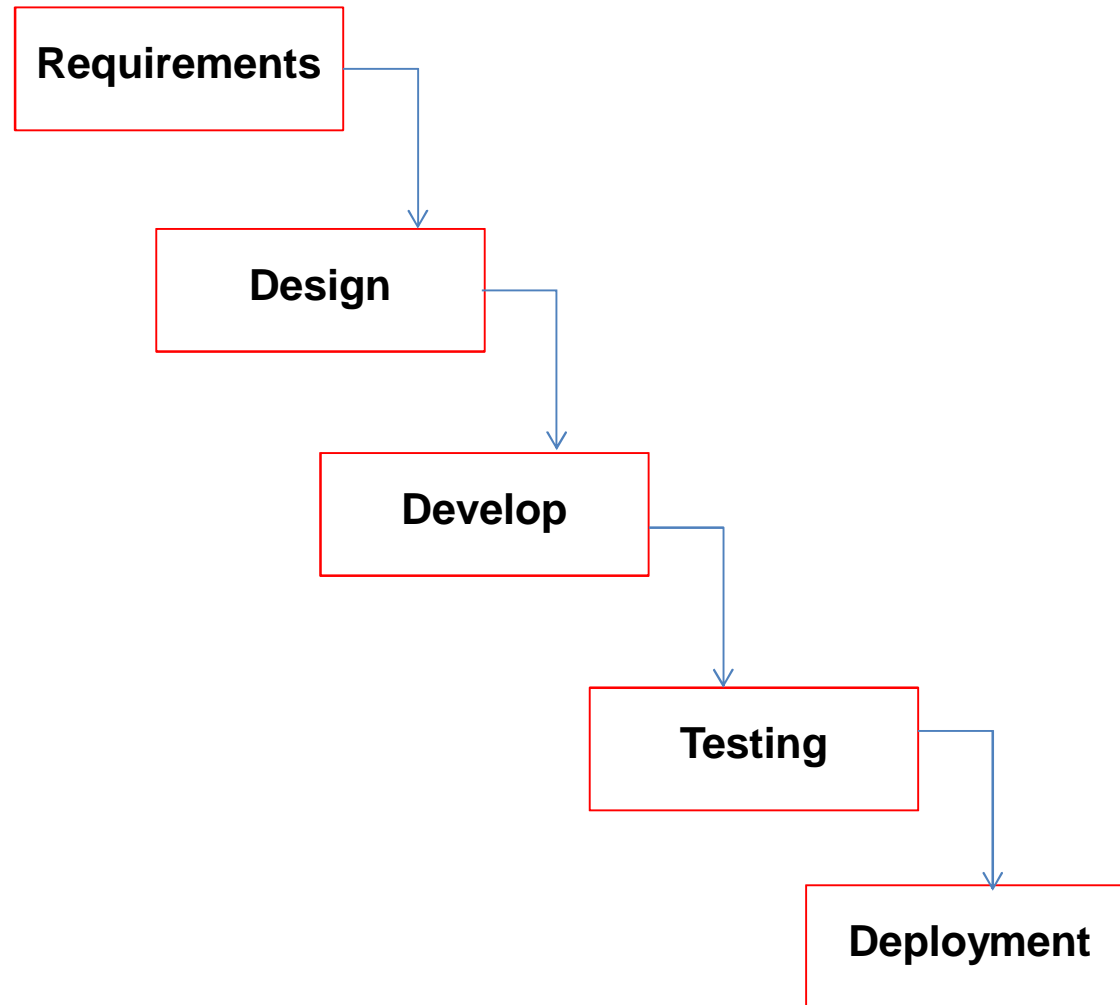
A packaged application is a large-grained **Commercial-Off-The-Shelf (COTS)** product that provides a significant amount of capability (and reuse)

- The amount of **custom development required is greatly reduced.**
- Primary focus is on **configuring** the application

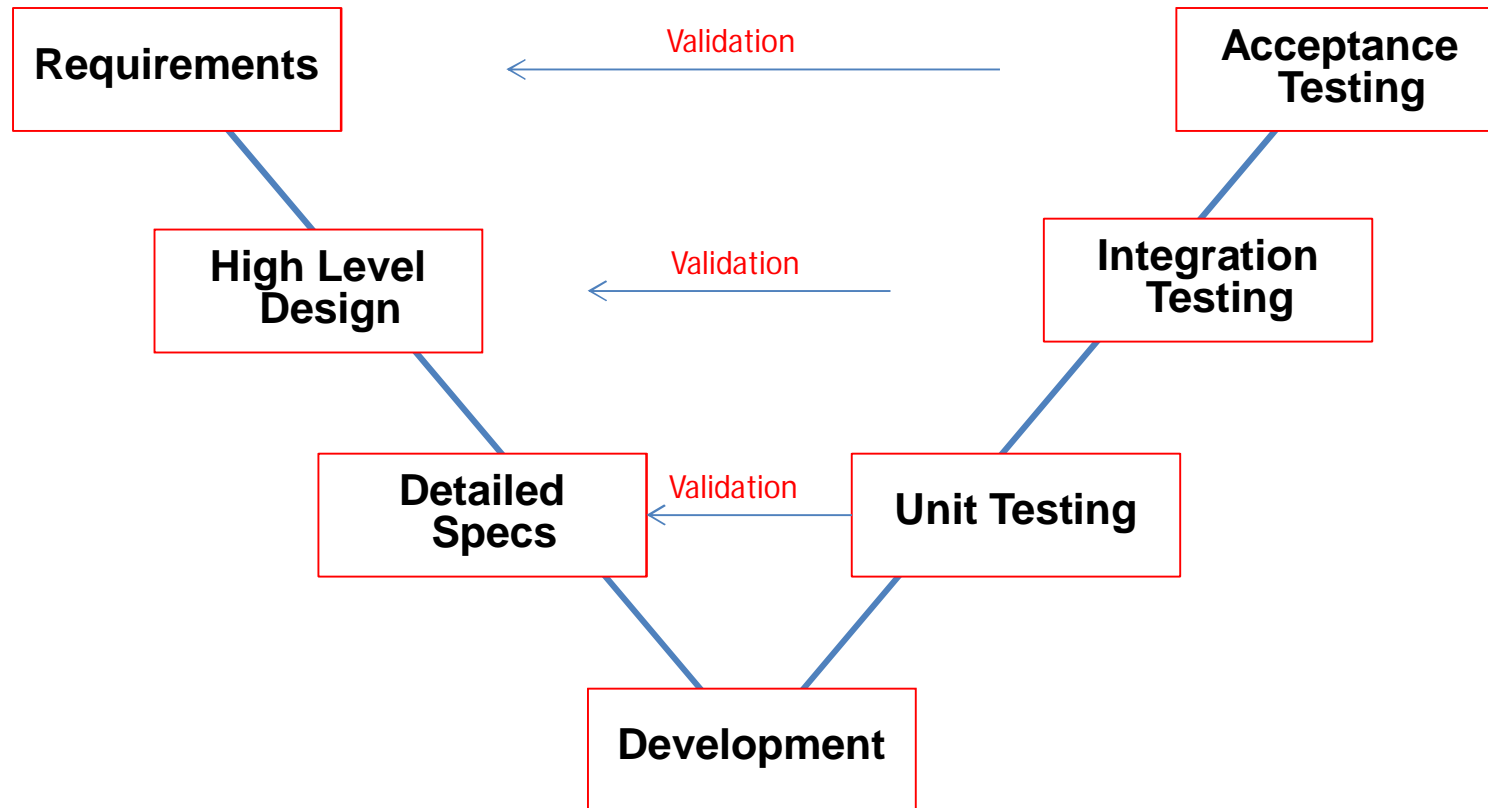
When to use which methodology



Waterfall Model



V-Model



Agile – Scrum Method



Source: Adapted from *Agile Software Development with Scrum* by Ken Schwaber and Mike Beedle.

How to Measure the Success Level

Application Development and Management Maturity Model

0 Non-existent when

There is no process for designing and specifying applications. Typically, **applications are obtained based on vendor-driven offerings**, brand recognition or IT staff familiarity with specific products, with little or **no consideration of actual requirements**.

1 Initial/Ad Hoc when

There is an awareness that a process for acquiring and maintaining applications is required. Approaches to acquiring and maintaining application software vary from **project to project**. Some individual solutions to particular business requirements are likely to have been acquired independently, resulting in inefficiencies with maintenance and support.

2 Repeatable but Intuitive when

There are different, but similar, processes for acquiring and maintaining applications based on the expertise within the IT function. The success rate with applications depends greatly on the in-house skills and experience levels within IT. **Maintenance is usually problematic and suffers when internal knowledge is lost from the organization**. There is little consideration of application security and availability in the design or acquisition of application software.

How to Measure the Success Level

Application Development and Management Maturity Model

3 Defined when

A clear, defined and generally understood process exists for the acquisition and maintenance of application software. This process is aligned with IT and business strategy. An attempt is made to apply the documented processes consistently across different applications and projects. *The methodologies are generally inflexible and difficult to apply in all cases, so steps are likely to be bypassed. Maintenance activities are planned, scheduled and coordinated.*

4 Managed and Measurable when

There is a formal and well-understood methodology that includes a design and specification process, criteria for acquisition, a process for testing and requirements for documentation. Documented and agreed-upon approval mechanisms exist to ensure that all steps are followed and exceptions are authorized. *Practices and procedures evolve and are well suited to the organization, used by all staff and applicable to most application requirements.*

How to Measure the Success Level

Application Development and Management Maturity Model

5 Optimized when

Application software acquisition and maintenance practices are aligned with the defined process. The approach is component based, with predefined, standardized applications matched to business needs. [The approach is enterprise wide](#). The acquisition and maintenance methodology is well advanced and enables rapid deployment, allowing for high responsiveness and flexibility in responding to changing business requirements. The application software acquisition and implementation methodology is subjected to continuous improvement and is supported by internal and external knowledge databases containing reference materials and good practices. [The methodology creates documentation in a predefined structure that makes production and maintenance efficient](#).

Practical Data Management Improvement

Data Architecture Frameworks



Create Data
Governance
Process



1967,
CobiT

Data
Management



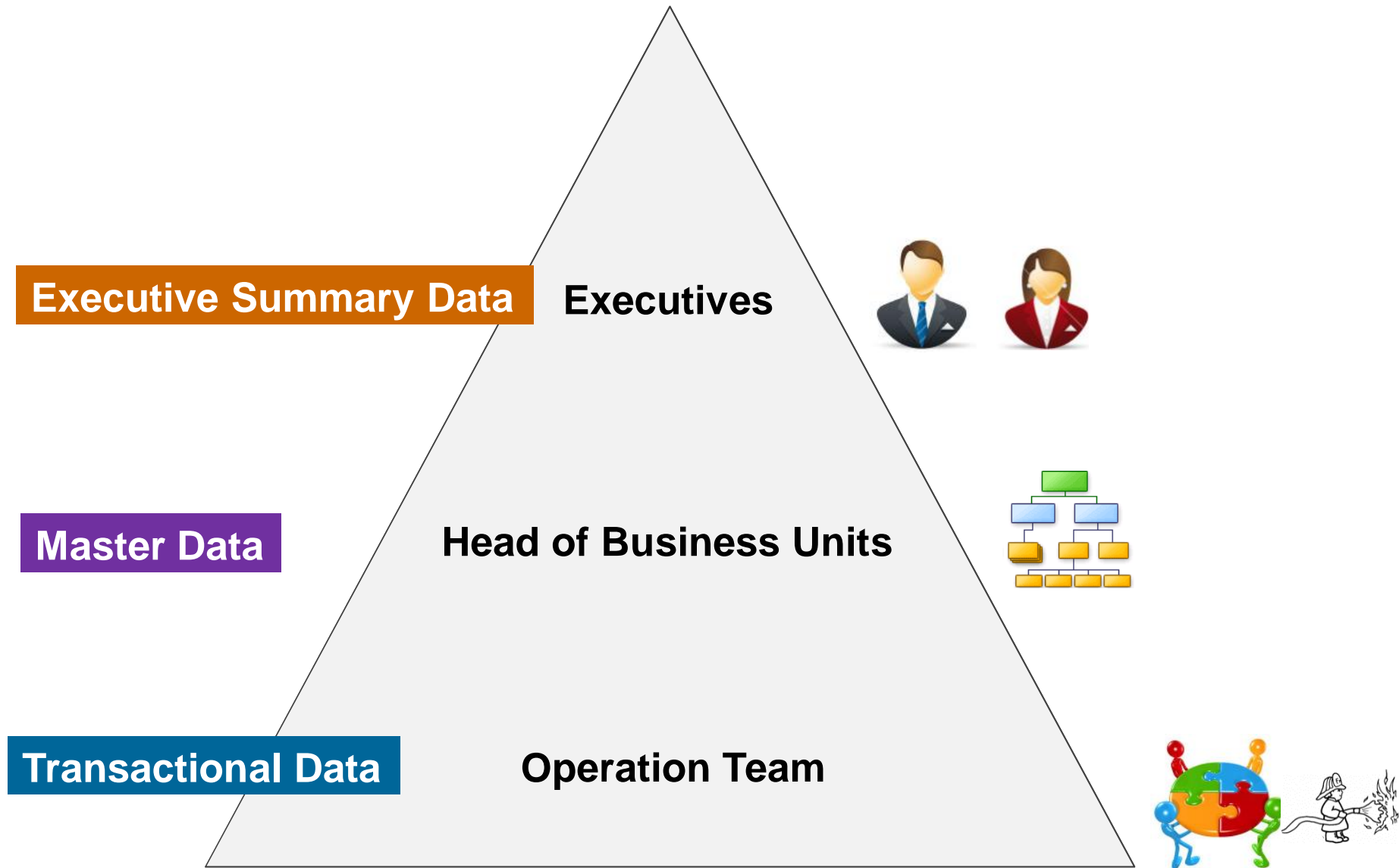
1980,
DMBOK



1996,
TOGAF

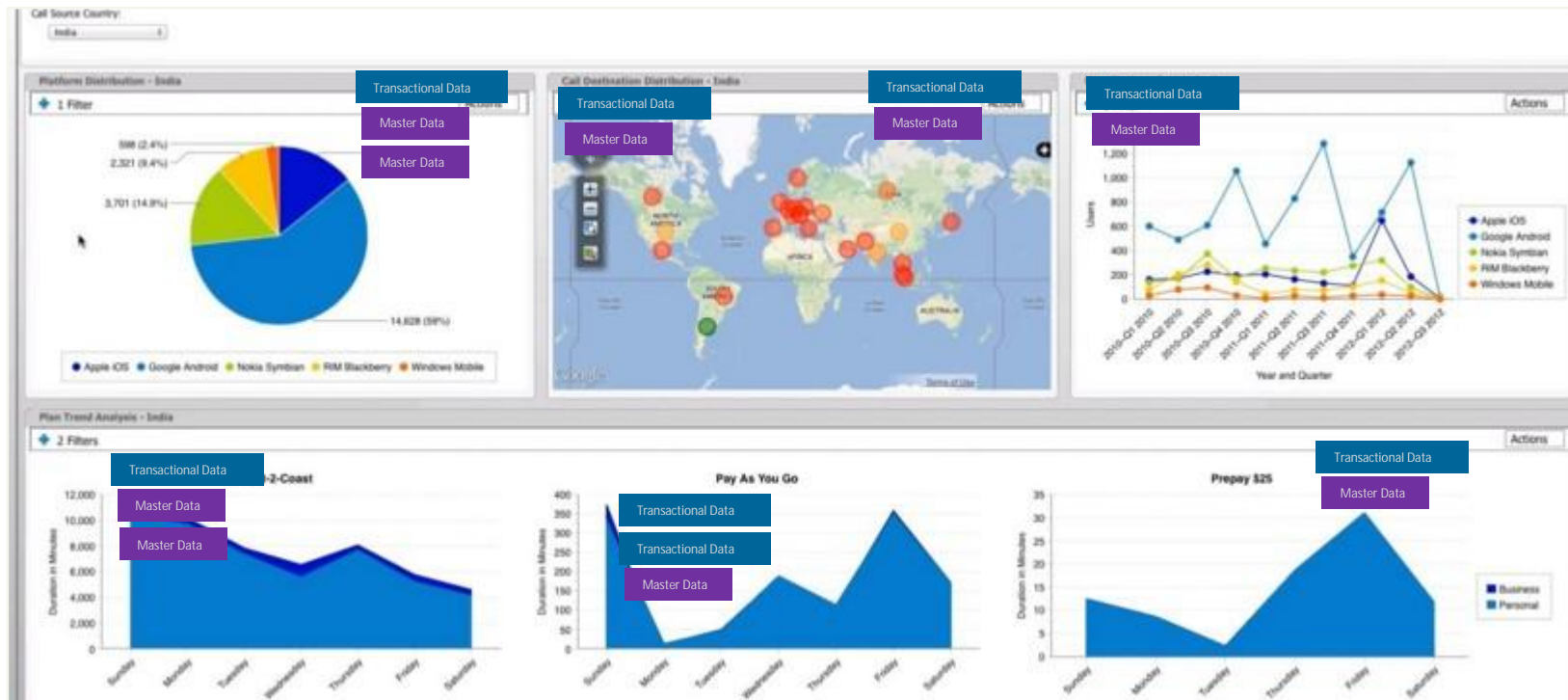
Create Data
Architecture
Process

Discovering the Enterprise Data



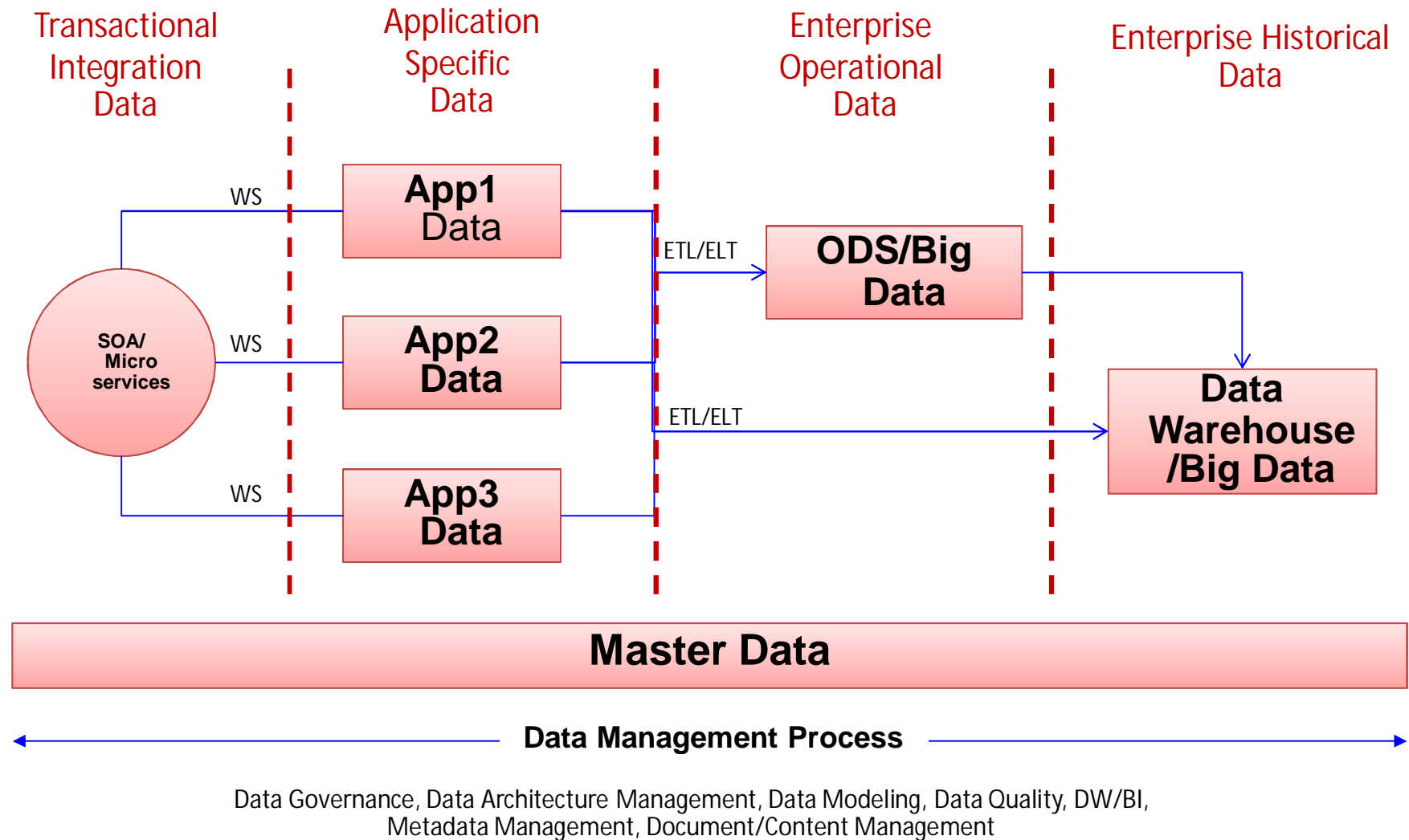
Discovering The Enterprise Data

Drill in the Executive Reports

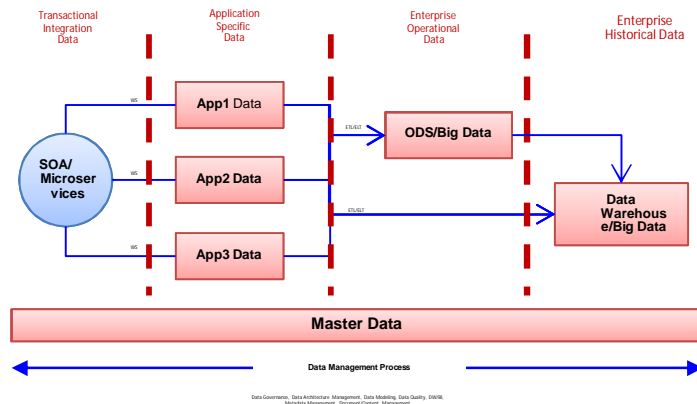


Enterprise Data Flow

Enterprise Data Flow



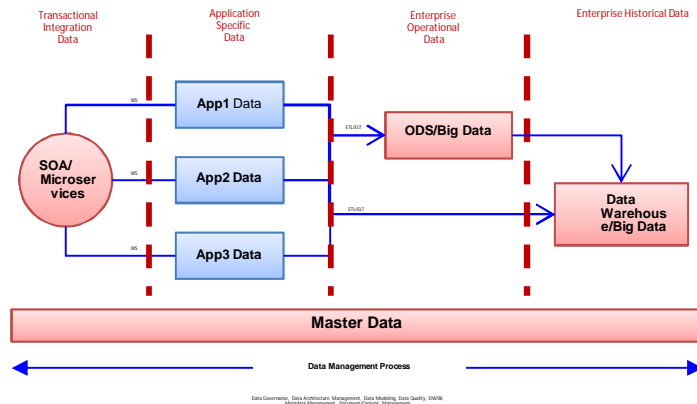
Transactional Integration Data



Guidelines:-

1. Define Transactional Integration Data
2. Identify Source and Target Systems
3. Put All Data Models in **XSD, or JSON** format
4. Acquire Metadata Tool for data modeling
5. Leverage for data transformation tool
6. Secure the data service with Proxy Interface
7. Use of Tool to perform online Data Field Mapping between Enterprise Name and Application Specific Name
8. Acquire Real-time Data Integration Monitoring Tool

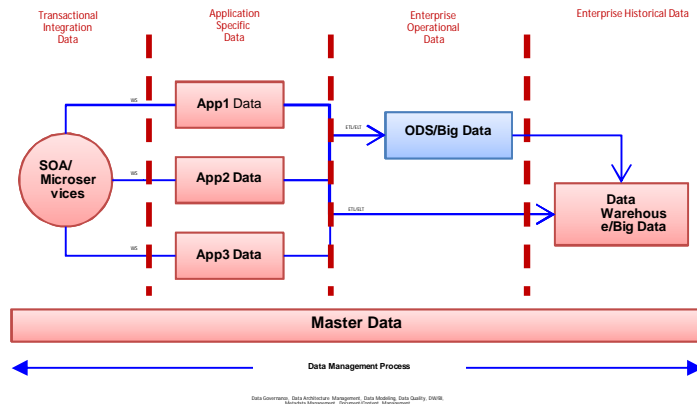
Application Specific Data



Guidelines:-

1. Acquire **Open Standard Industry Data Model** where possible
2. **Standardize Data Definition** throughout Applications
3. **Do Not Try to Create New Data Fields** before Checking Application Data Template
4. Adoption of WS and WS Attachment for Integration part
5. Minimize Point to Point Batch Integration where possible to **reduce Eco-System Overhead**
6. Always define **Data Cleansing Roles** in Business User rather than doing in IT Department
7. Maximize Centralized Master Data Usage
8. Also Classify an **Unstructured Data in both Master Data and Operational Data types**

Enterprise Operational Data Store



Guidelines:-

1. Focus Data only for **Business Operation** Level
2. Understand ODS Usage Pattern
 - **Exchange Data between Applications**
 - **For Enterprise Operational Reporting**
3. For structure data, leverage 3NF for ODS Database
4. For structure data, standardize Data Key (eg. Customer ID) for All Application where possible
5. For structure data, Define Data **Create/Update Sequence from authorized Application Systems**
6. For unstructured data, leverage **Data Lake** technology
7. Define Data Remove Process
8. Maximize Master Data Usage
9. Leverage System Monitoring

Data Lake Overview



HOW DO DATA LAKES WORK?

The concept can be compared to a water body, a lake, where water flows in, filling up a reservoir and flows out.

STRUCTURED DATA

1. Information in rows and columns
2. Easily ordered and processed with data mining tools

1

The incoming flow represents multiple raw data archives ranging from emails, spreadsheets, social media content, etc.

2

The reservoir of water is a dataset, where you run analytics on all the data.

3

The outflow of water is the analyzed data.

4

Through this process, you are able to "sift" through all the data quickly to gain key business insights.

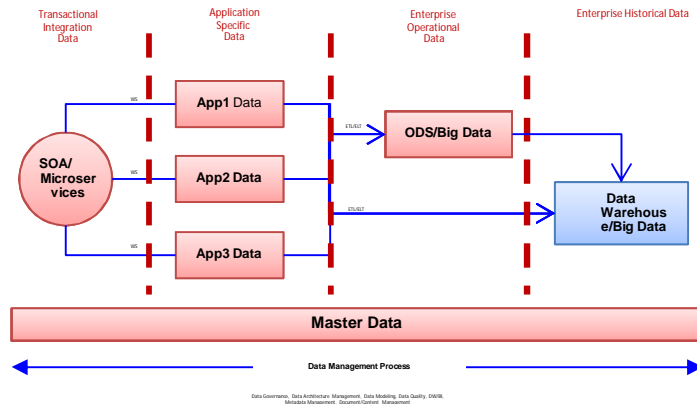
UNSTRUCTURED DATA

1. Raw, unorganized data
2. Emails
3. PDF files
4. Images, video and audio
5. Social media tools



www.digitalnewsasia.com

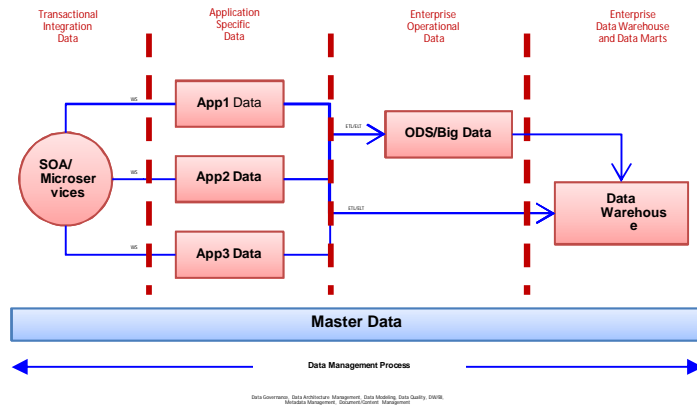
Enterprise Historical Data



Guidelines:-

1. Focus Data only for Business **Long Term Strategy**
2. Create a reliable system architecture for some ac-hoc query might impact to overall performance
3. Always **pro-active advertise** the new set of subject available to Business Users
4. **Educate End-User** for the Dashboard/Alert Tool
5. Distribute Summary Report to End-User to **Minimize Large Data Inquiry Cost**
6. Big data technology for predictive and prescriptive analytics

Master Data



Guideline:-

1. Define Master Data Owner and Change Control
2. Adopt Data Governance for MDM process
3. Master Data Classification
4. Define Source and Target of Master Data
5. Acquire Data Profiling and Quality Tool for Data Cleansing
6. Define Master and Replica Data if any

Data Quality

The state of completeness, validity, consistency, timeliness and accuracy that makes data appropriate for an enterprise use

Three Main Data Quality Metrics

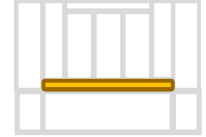
- Business Relevance
 - Executive Reports/Critical Business Process
- Accountability
- Controllability and Track-ability

Sample Customer Data Profiling

Customer Entity Name	Description
ACCOUNT TYPE	Lookup for account type. The account type could include Installment Payment Account, Charge Account, Trade Account, Layaway Account, and Rental Account.
ADDRESS LOCATION	Address of an individual location.
CUSTOMER	An individual or organization that purchases, may purchase, or did purchase goods and or services from a retail store.
CUSTOMER ACCOUNT	A charge account or other accounting relationship a customer has with the store or organization. An account exists to allow the store to record a series of transactions with the same customer and keep an ongoing record of monies owed by the customer and monies due to the customer.
CUSTOMER ADDRESS	Assigns the address location to a Profile or Customer.
CUSTOMER AFFILIATION	Associates a customer with a customer group.
CUSTOMER GROUP	A group of customers based on specific demographic and marketing attributes and properties. Examples include over 65 year old customers, students, unions, and other associations.
CUSTOMER GROUP ITEM	An association of Item and Customer Group, the data for this may come from external source.
CUSTOMER CLUSTER	Customer clusters and their descriptions. The data may come from an external source.
CUSTOMER occasion	Events celebrated or observed by a customer. For example, Mother's Day, Thanksgiving, and others.
CUSTOMER occasion TYPE	Lookup for Customer Occasion types.
CUSTOMER RELATIONSHIP	Association between customers. Example associating the Husband-Wife relationship.
CUSTOMER RELATIONSHIP INFO	Information regarding the customer or prospect that is restricted to comply with privacy and other laws. This table is encrypted.
CUSTOMER PREFERENCE	Merchandise preferences of a Key Customer, for classes of items or other general categories.
CUSTOMER STATUS	Lookup for customer or prospect status.
CUSTOMER QUICKFACTS	Collection of Customer related measures.
DEMOGRAPHY ATTRIBUTE	A sub-level group or category further qualifying a set of data (Profile Group) collected about a customer to assist in marketing efforts. Examples: NC - Number of Children, EDL - Education Level, and others.
DEMOGRAPHY GROUP	The domain of classifications used to group profile information about a Party. Examples include the following: <ul style="list-style-type: none"> •CH - Credit History •ED- Education •EM - Employment •EQ- Equipment •HB - Hobbies •HH - Household •OR - Organization •Other relevant demographics and psychographics
DERIVED VALUE	Derived value of the customer as defined by the user.
HOUSEHOLD	Household statistics and demographic information.
INDIVIDUAL DEMOGRAPHY VALUE	Detailed demographic information describing customers. For example age has Demography group as AGE, Attribute contains various bands and value as 15 years, which would be stored in this entity.
MEMBERSHIP ACCOUNT	Membership Account details such as frequent shopper membership points.
MEMBERSHIP TYPE	Lookup value for membership type.
STATUS	Lookup for status reason.
STATUS REASON	A reason why a particular Party Status Type may be assigned to a customer
STATUS TYPE	Lookup Table for status type: <ul style="list-style-type: none"> A - Active I - Inactive P - Prospective U - Unmarketable (for example, deceased)
VALUE MEASURE	User defined measures that help define the derived value of customer or prospect.
VALUE TYPE	User defined value types that help define the derived value of a customer or prospect.

[illegible]

Common Data Lost Classification



- Planned and unplanned outages
- Loss of the server hardware
- Disk hardware failure
- Operating system failure
- DBMS software failure
- Application problems
- Network failure
- Data center site loss
- Security and authorization problems
- Corruption of data (due to bugs, poor design)
- Loss of database objects
- Data replication failure
- Severe performance problems
- Recovery failures
- Human error

Data Governance

Definition

- The exercise of authority and control (planning, monitoring, and enforcement) over the management of data assets

Goals

- To define, approve, and communicate data strategies, policies, standards, architecture, procedures, and metrics
- To track and enforce regulatory compliance and conformance to data policies, standards, architecture, and procedures
- To sponsor, track, and oversee the delivery of data management projects and services
- To manage and resolve data related issues
- To understand and promote the value of data assets

Enterprise Data Management Worksheet

N o.	Master/ Transactional / Summary Data	Data Name	Owner	Used by Critical Business Processes (Y/N)	Use By Executive Reports (Y/N)	Change Control (Y/N), Change Procedur e	Sample Data Structure, Data Type, Data Range	Current Issues With % of Records are align with its profiling	Remarks

How to Measure the Success Level

Data Management Maturity Model

0 Non-existent when

Data are not recognized as corporate resources and assets. There is no assigned data ownership or individual accountability for data management. Data quality and security are poor or non-existent.

1 Initial/Ad Hoc when

The organization recognizes a need for effective data architecture and management. There is an ad hoc approach for specifying security requirements for data architecture and management, but **no formal communications procedures are in place. No training on data architecture and management takes place.** Responsibility for data management is not clear.

2 Repeatable but Intuitive when

The awareness of the need for effective data architecture and management exists throughout the organization. Data ownership at a high level begins to occur. Security requirements for data management are documented by key individuals. Some monitoring within IT is performed on data management key activities (e.g., backup, restoration, disposal). **Responsibilities for data management are informally assigned for key IT staff members.**

How to Measure the Success Level

Data Management Maturity Model

3 Defined when

The need for data management within IT and across the organisation is understood and accepted.

Responsibility for data architecture and management is established. Data ownership is assigned to the responsible party who controls integrity and security. Data management procedures are formalized within IT, and some tools for backup/restoration and disposal of equipment are used. Some monitoring over data management is in place. Basic performance metrics are defined. Training for data management staff members is emerging.

4 Managed and Measurable when

The need for data management is understood, and required actions are accepted within the organisation. Responsibility for data ownership and management are clearly defined, assigned and communicated within the organisation. Procedures are formalized and widely known, and knowledge is shared. Usage of current tools is emerging. Goal and performance indicators are agreed to with customers and monitored through a well-defined process. Formal training for data management staff members is in place.

How to Measure the Success Level

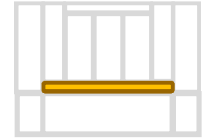
Data Management Maturity Model

5 Optimized when

The need for data architecture and management and the understanding of all required actions is understood and accepted within the organisation. Future needs and requirements are explored in a proactive manner. The responsibilities for data ownership and data management are clearly established, widely known across the organisation and updated on a timely basis. Procedures are formalized and widely known, and knowledge sharing is standard practice. **Sophisticated tools are used with maximum automation of data management.** Goal and performance indicators are agreed to with customers, linked to business objectives and consistently monitored using a well-defined process. **Opportunities for improvement are constantly explored. Training for data management staff members is instituted.**

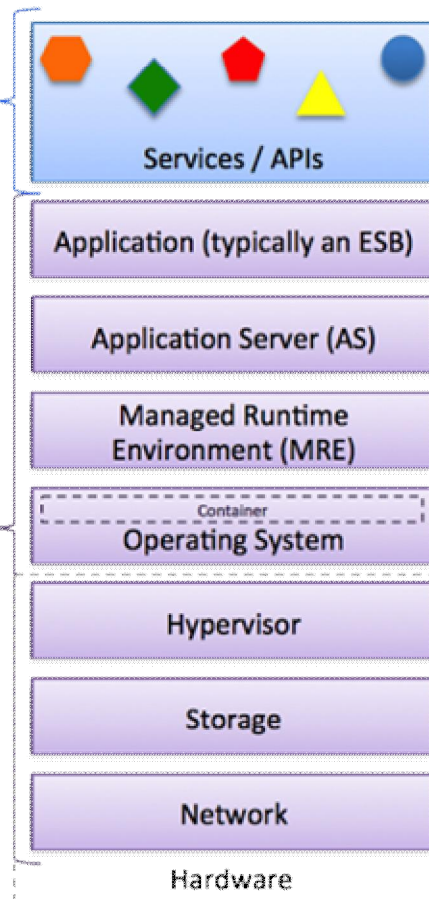
Technology Architecture

SOA and Microservices



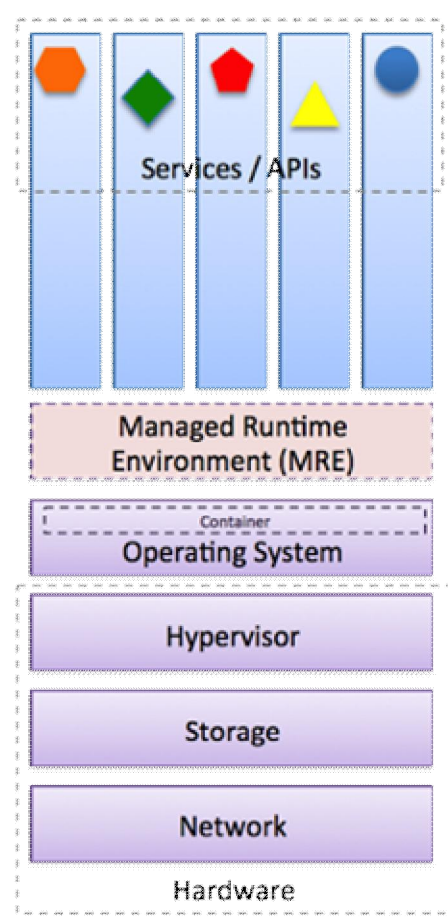
- Built on common governance and standards
- Common tech stack
- Contracts define service/APIs interfaces
- Granularity focused on business capabilities
- Typically Services/APIs run on an ESB
- Use of Canonical schemas not uncommon for business services, less common in APIs
- APIs typically targeted for external use (exposed in DMZ)
- HTTP transport of choice but multi-protocols supported
- Multiple message protocols supported (SOAP/XML, REST/JSON, etc)
- DevOps / Continuous Delivery becoming more popular not yet mainstream

Typical Systems Layers
In SOA Architectures



- Common platform for all services deployed to it
- Typically services/APIs runs on an AS, that depends on an MRE
- Resources made available to and managed by MRE and AS
- Multi-threaded with more overheads to handle I/Os
- Use of containers (i.e. Dockers, Linux Containers) less popular
- Common hardware for all services/APIs running on the same ESB or Application Server clusters

Typical Systems Layers
In Microservices Architecture

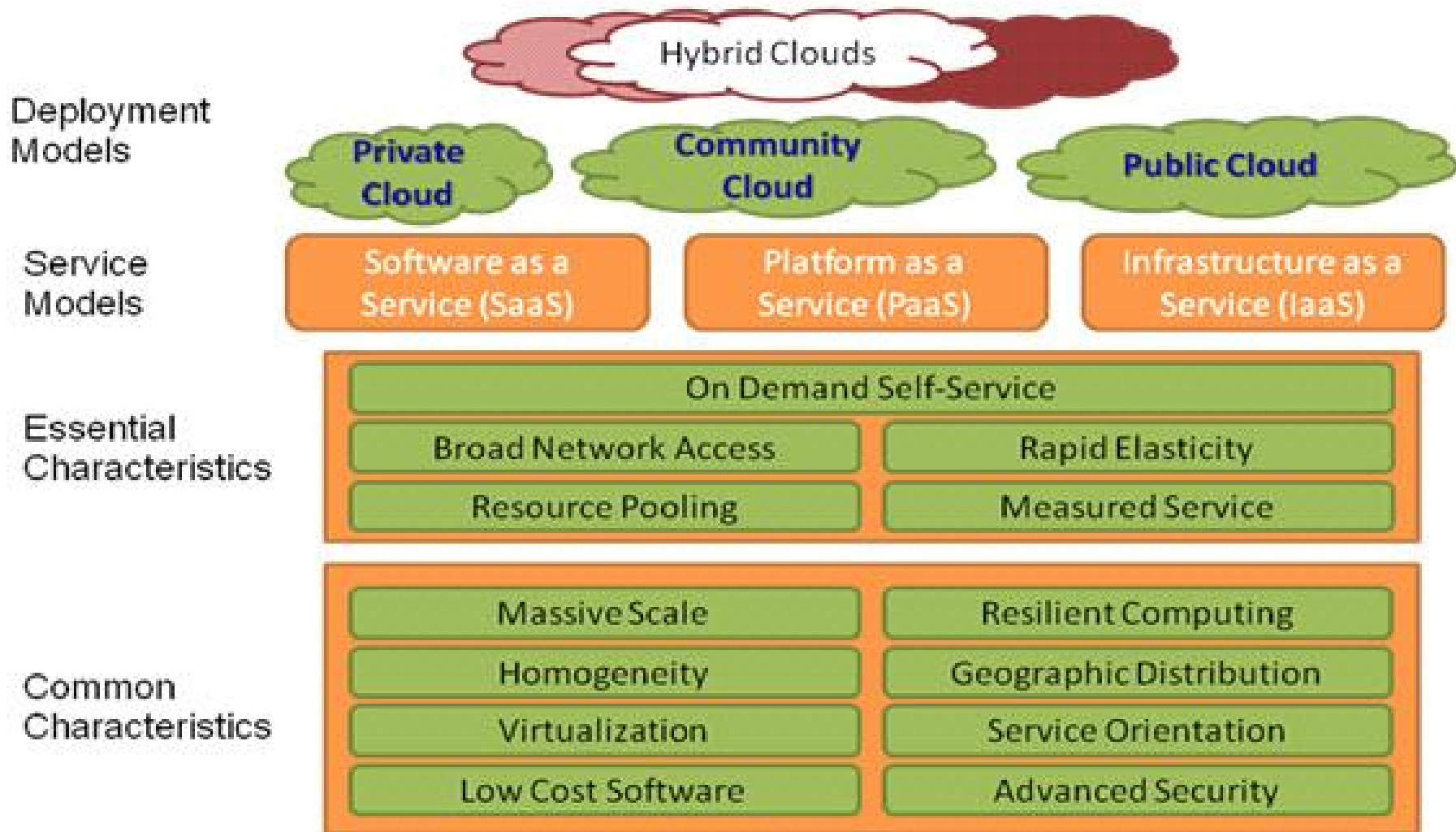


- Relaxed governance: less focus on common standards and more on people collaboration and freedom of choice
- Use of ESBs not popular
- Granularity focused on business capabilities
- Services/APIs are self-contained and can run independently from each other
- Services/APIs built using tech stack of choice (usually one that's best for the job)
- Use of Lightweight protocols, such as HTTP/REST and AMQP
- Strong focus on DevOps / Continuous Delivery from the start
- Services are stateless

- Single-threaded typically with use of Event Loop (callbacks) features for non-locking I/O handling
- Application Servers not really used. Platforms such as NodeJS can be used but not mandated (as said, no tech stack enforced)
- Use of containers (i.e. Dockers, Linux Containers) more popular as services/APIs are more independent on other applications
- Common hardware optional

www.soa4u.co.uk

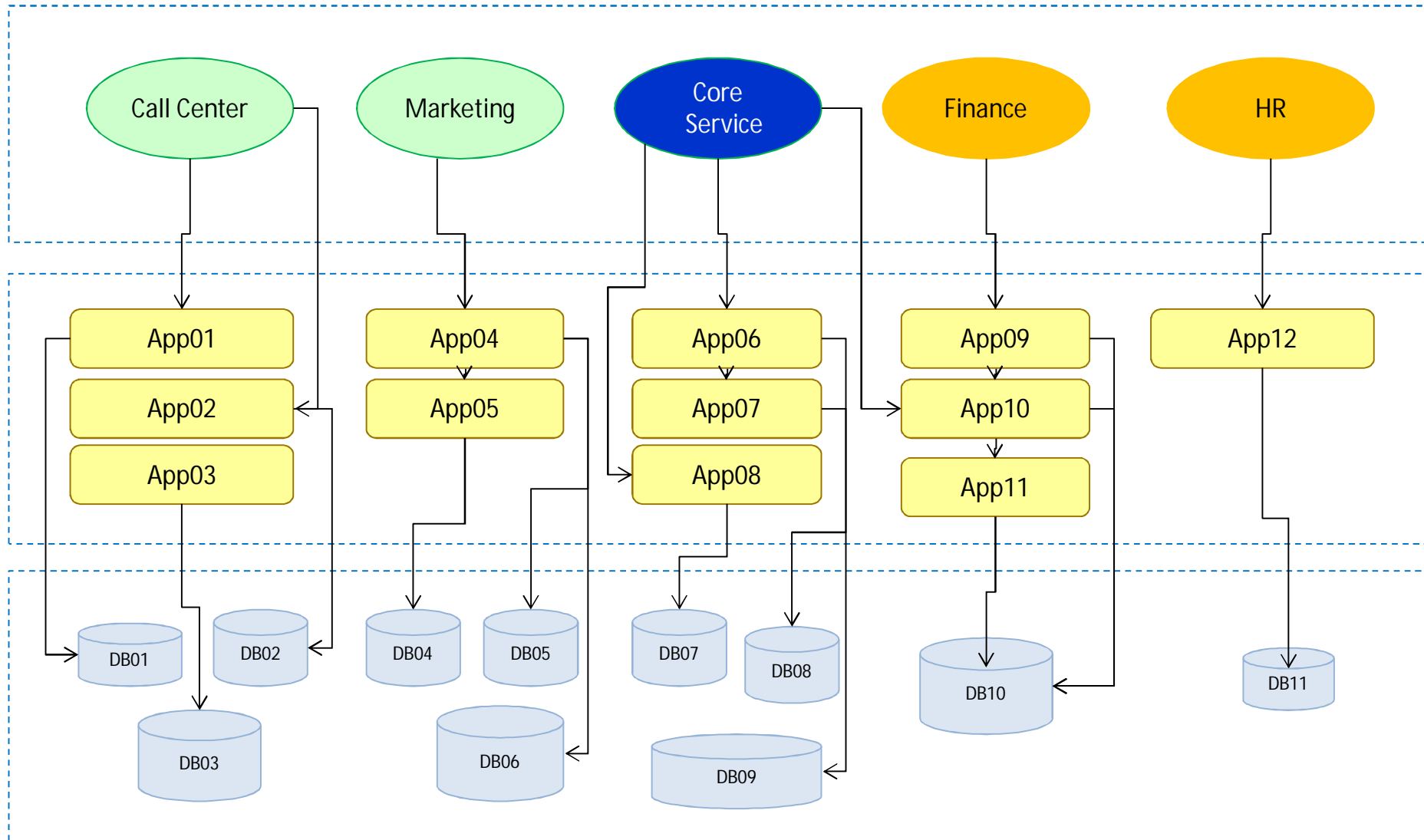
Cloud Computing



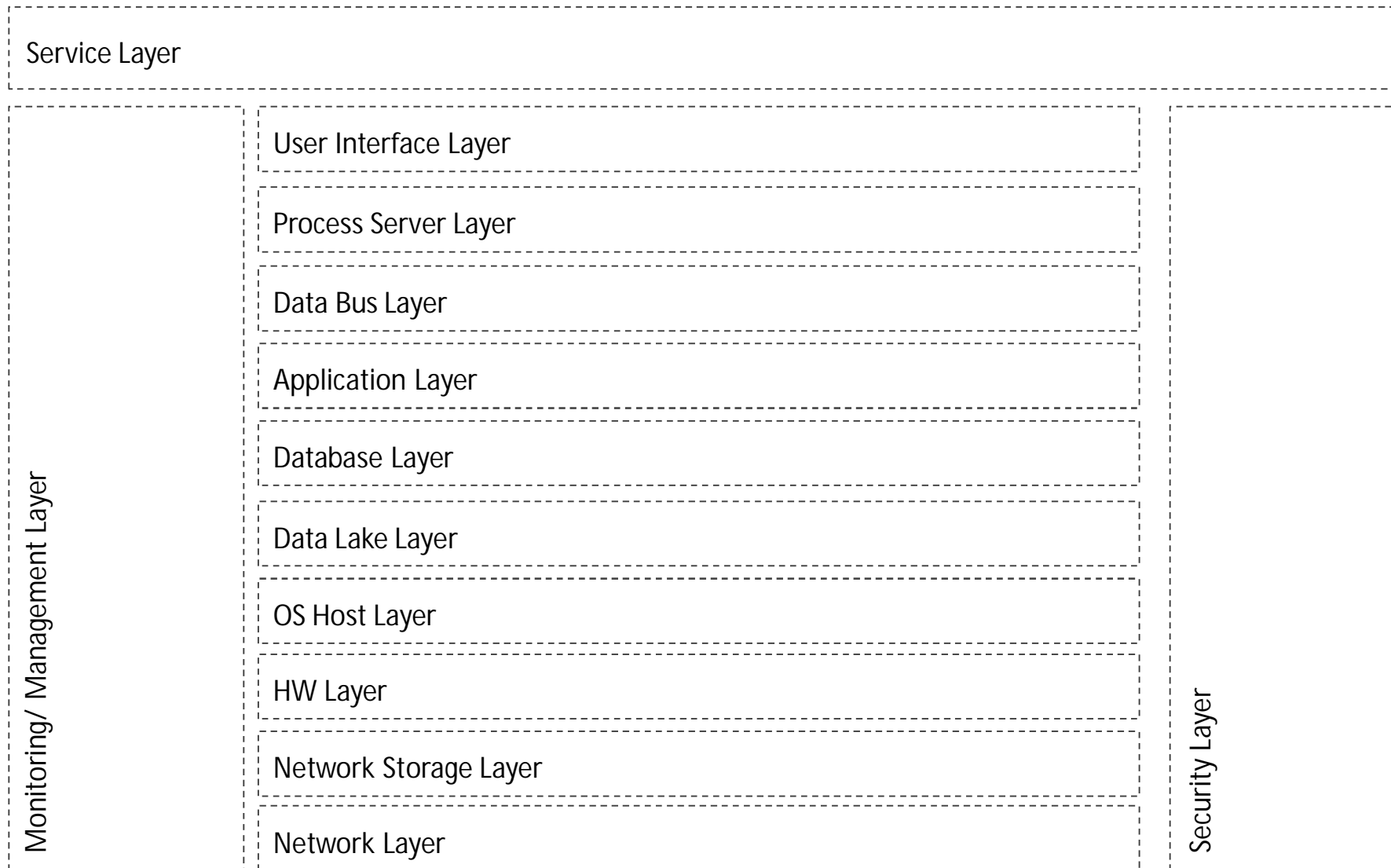
NIST, 2015

Group workshop - Business Services and IT Alignment

1.5 hrs. brainstorm and 15 mins. presentation

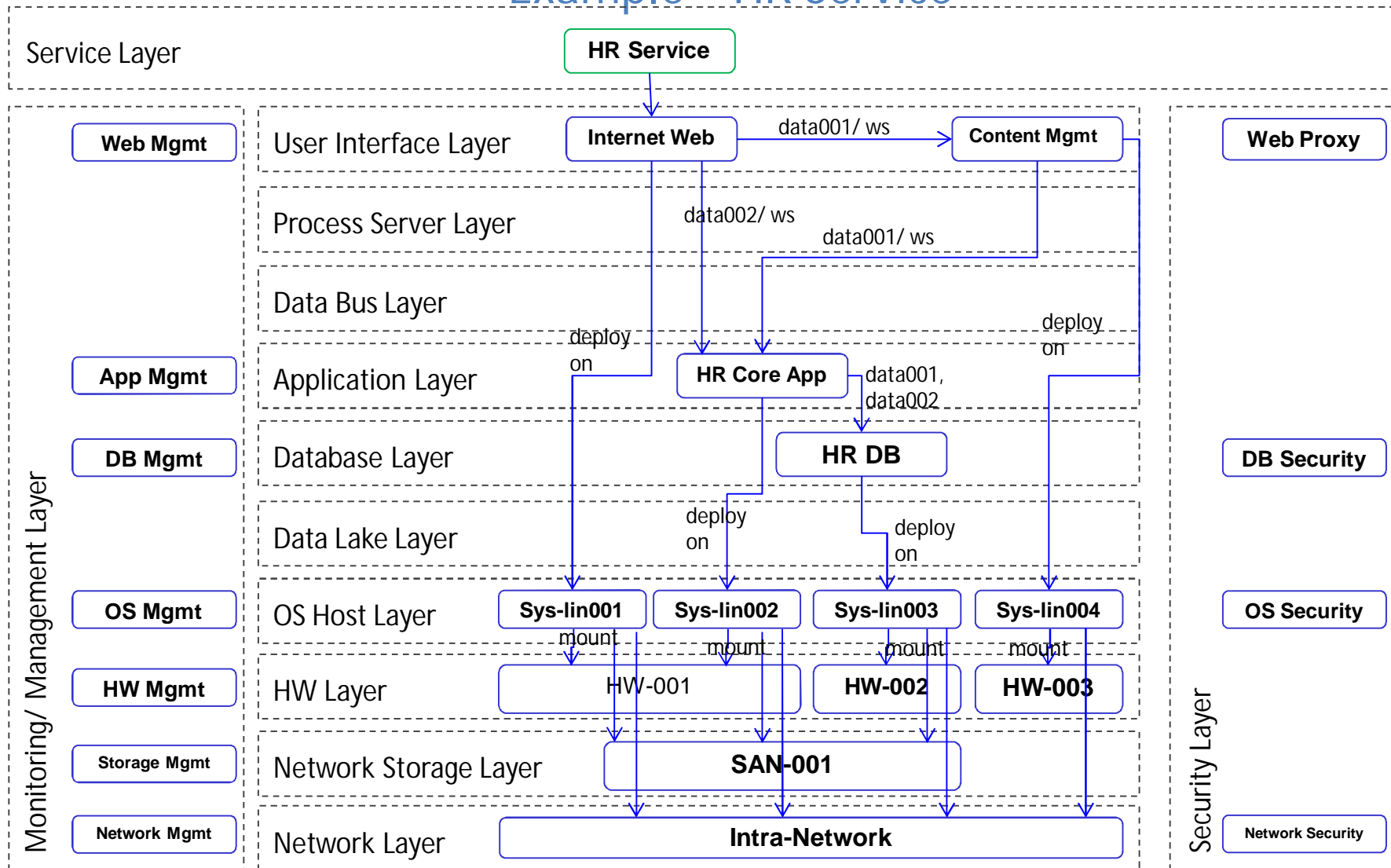


Logical Configuration Management Model



Logical Configuration Management Model

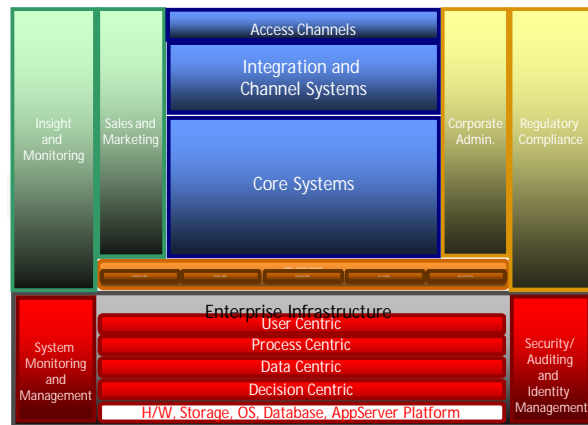
Example – HR Service



Detailed Layer of Technology Architectures

Technology Standard and Key Consideration

Database Server and Application Server



Database

- ANSI (American National Standards Institute) SQL
- DB Programming support
- DB and System Diagnostic and Tuning Tool
- Segregation of Duty Support
- Active-Active Clustering
- DB Machine

Application Server

- Open Development Framework
- Monitoring Matrix; eg. JMX, Managed Bean
- In-Memory Session Clustering
- Deployment Descriptor
- Declarative Transaction
- Declarative Security Access Control
- Application Server Machine

Virtualization Technology

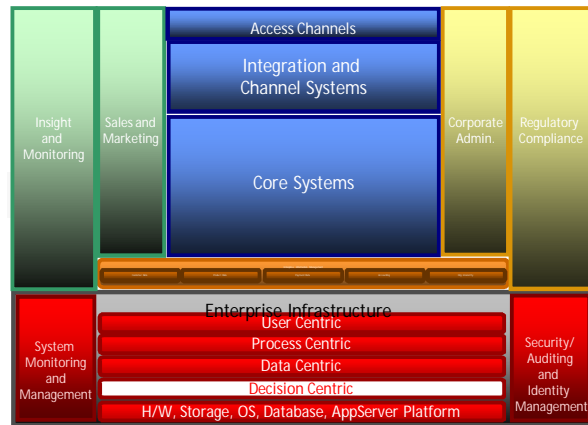
Virtualization shoot-out: Citrix, Microsoft, Red Hat, and VMware features				
	Citrix XenServer 5.6.1	Microsoft Windows Server 2008 Hyper-V R2	Red Hat Enterprise Virtualization 2.2	VMware vSphere 4.1
Bare-metal hypervisor	Yes	Yes	Yes	Yes
vCPUs per host	512	512	512	512
vCPUs per VM	8 Windows / 32 Linux	4	8	16
RAM per host	512GB	1TB	1TB	1TB
RAM per VM	32GB	64GB	256GB	255GB
Memory overcommitment	Yes	Yes	Yes	Yes
Page sharing	No	No	Yes	Yes
Virtual NICs	7 per guest	8 synthetic, 4 emulated	8 per guest	10 per guest
VLAN support	Yes	Yes (but with separate guest config)	Yes	Yes
Guest OS support	CentOS, Debian, Red Hat, Suse, Windows	Red Hat, Suse, Windows	Red Hat, Windows	Most x86 operating systems
Live migrations	Yes	Yes (requires Windows Clustering)	Yes	Yes
Live storage migrations	No	No (but can automate with VM suspend)	No	Yes
Load balancing	Yes	Yes	Yes	Yes
High availability	Yes	Yes	Yes (but not for complete host failure)	Yes
Maintenance mode for hosts	Yes	Yes	Yes	Yes
Templating and cloning	Yes	Yes	Yes	Yes
Thin provisioned VM disks	Yes	Yes	Yes	Yes
VM import/export	Yes	Yes	Yes	Yes
Snapshots	Yes	Yes	Yes	Yes
Remote console	Yes	Yes	Yes	Yes
PXE boot for VMs	Yes	Yes	Yes	Yes
Shared storage	Yes	Yes	Yes	Yes
Storage multipathing	Yes	Yes	Yes	Yes
Shared resource pools	Yes	Yes	Yes	Yes
API	Yes	Yes	Yes	Yes

Virtualization Technology is a technique to **consolidate server resources, reduce cost, promote IT share service and become more energy efficient**

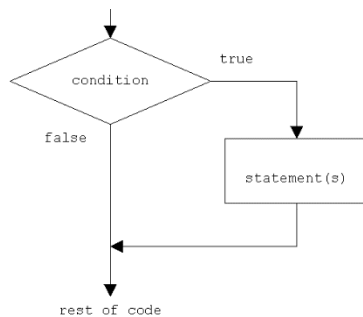
With a move toward delivering a cloud experience with IaaS, PaaS, DaaS, and SaaS, virtualization technology **must integrate with applications to facilitate the deployment and management of complete system**

Technology Standard and Key Consideration

Decision Layer



- Inference Rules Engine; User Invocation
- Event Condition Action; System Monitoring
- Rules describe in XML, POJOs, flat files
- Enterprise Metadata Repository System



Business Rules Technology

Pattern Definition

OKCancelApply

Choose Pattern

driver is a DriverData

Define Test for Pattern

☒ Standard Test ☐ Advanced Test

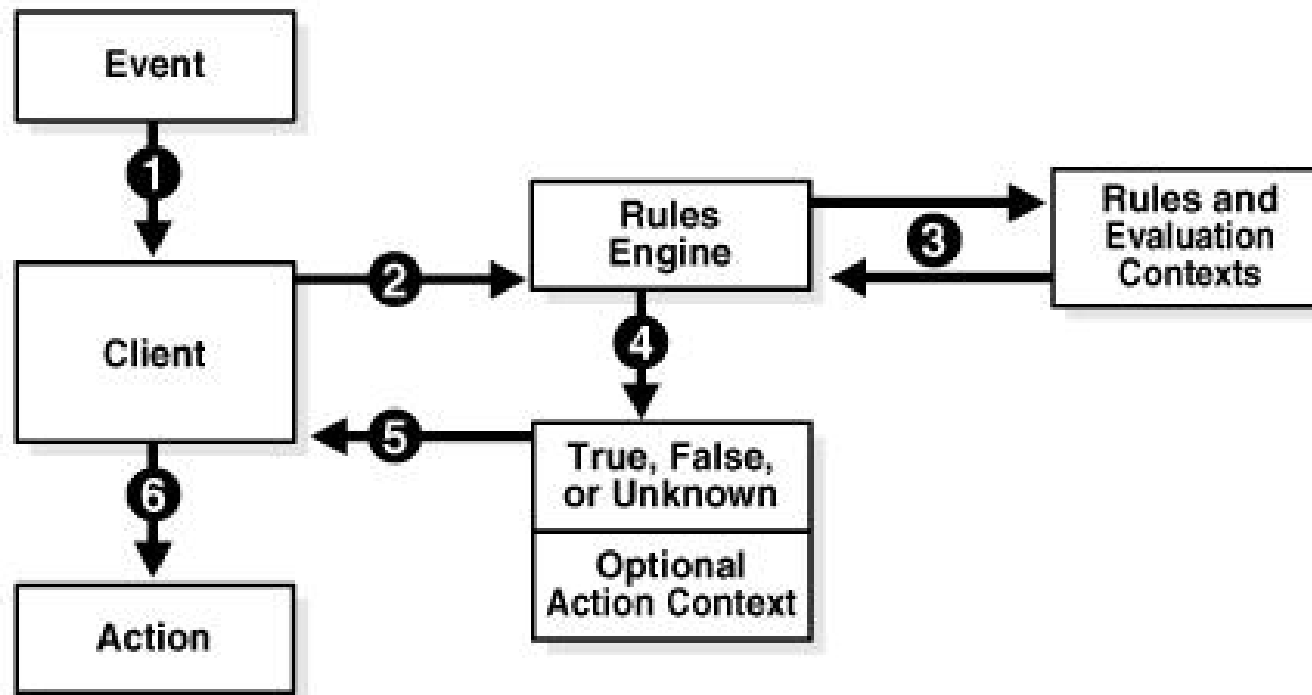
Delete | Create

Select All | Select None

	Operand	Operator	Operand (choose value or field)		
SelectField			Value		Field
<input type="checkbox"/>	driver.DriverAge <div></div>	< <div></div>	21	Any <div></div>	<make a choice> <div></div> Fixed <div></div>

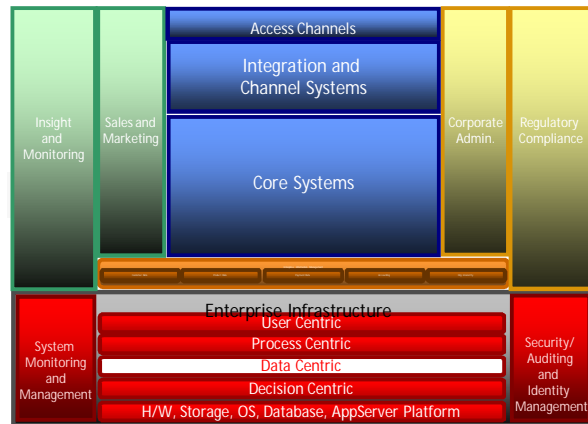
OKCancelApply

Business Rules Technology



Technology Standard and Key Consideration

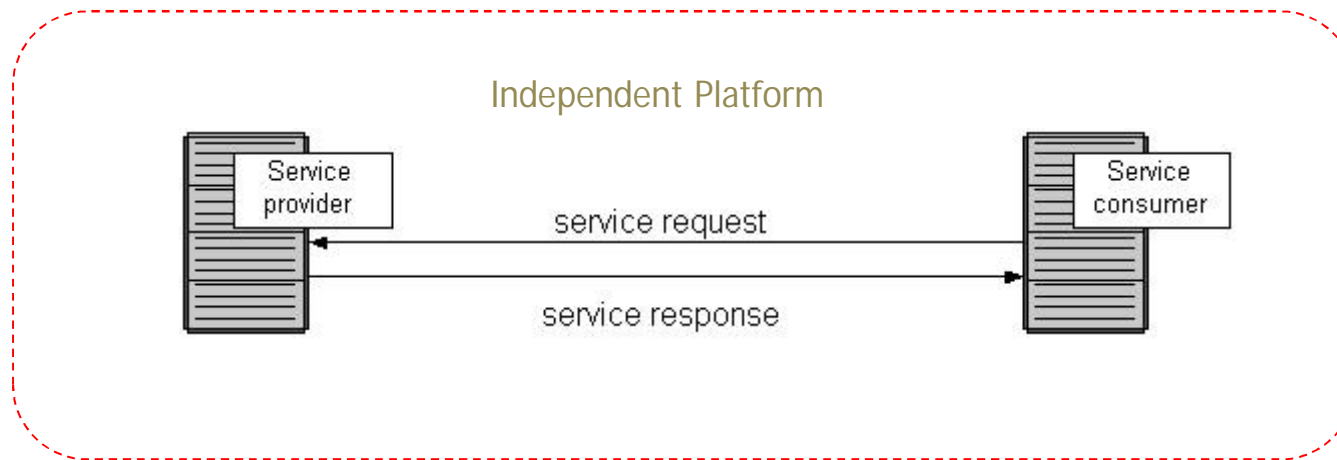
Data Integration Layer



- Reliable Data Transfer (persistence)
- Queuing System
- Transfer Priority and Security
- XML Declaration
- Routing Simulation
- Monitoring System and Exception Capturing
- Side-By-Side Versioning in Runtime

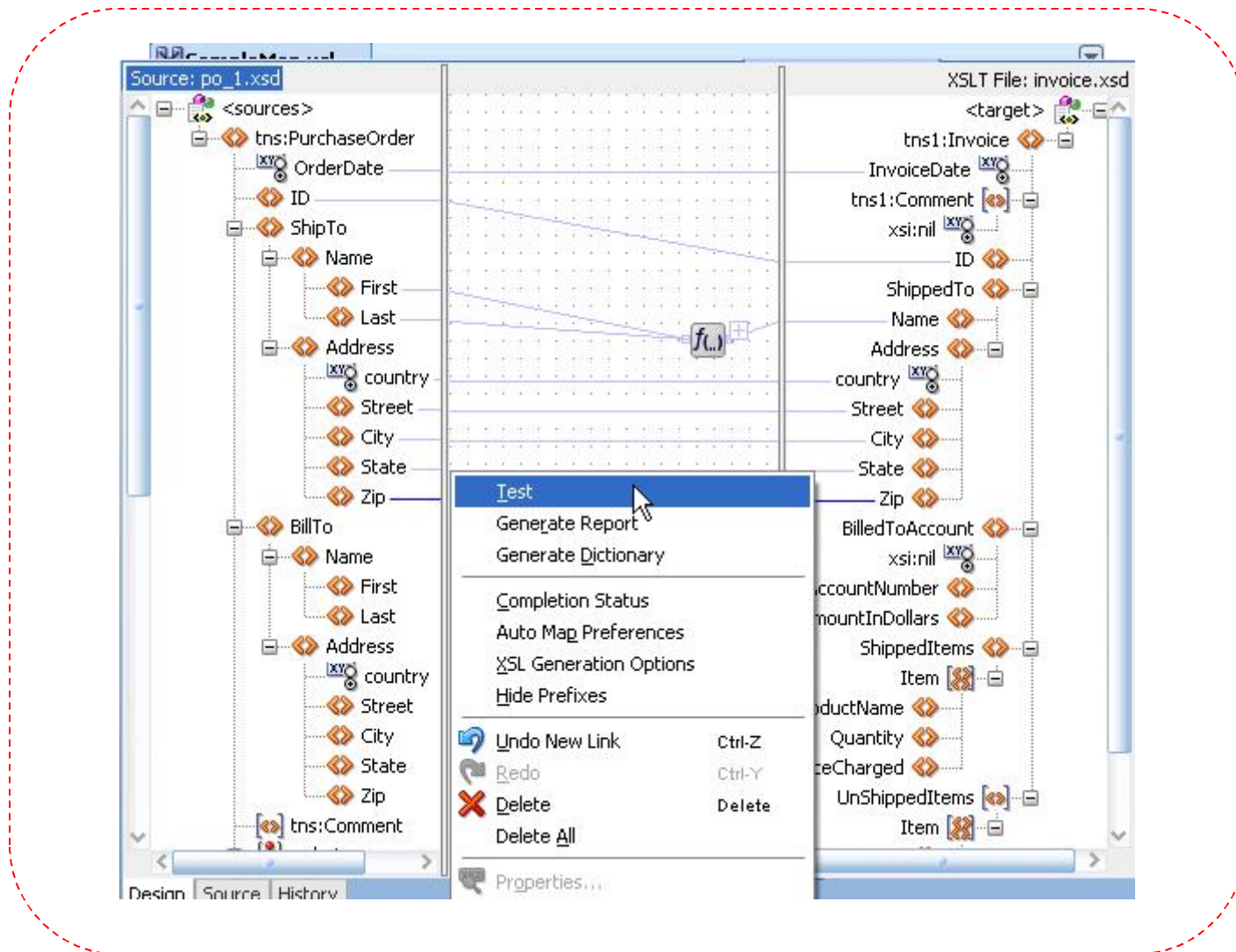
SOA for Interoperation

Services are well-defined business functionalities that are built as software components (discrete pieces of code and/or data structures) that can be reused for different purposes

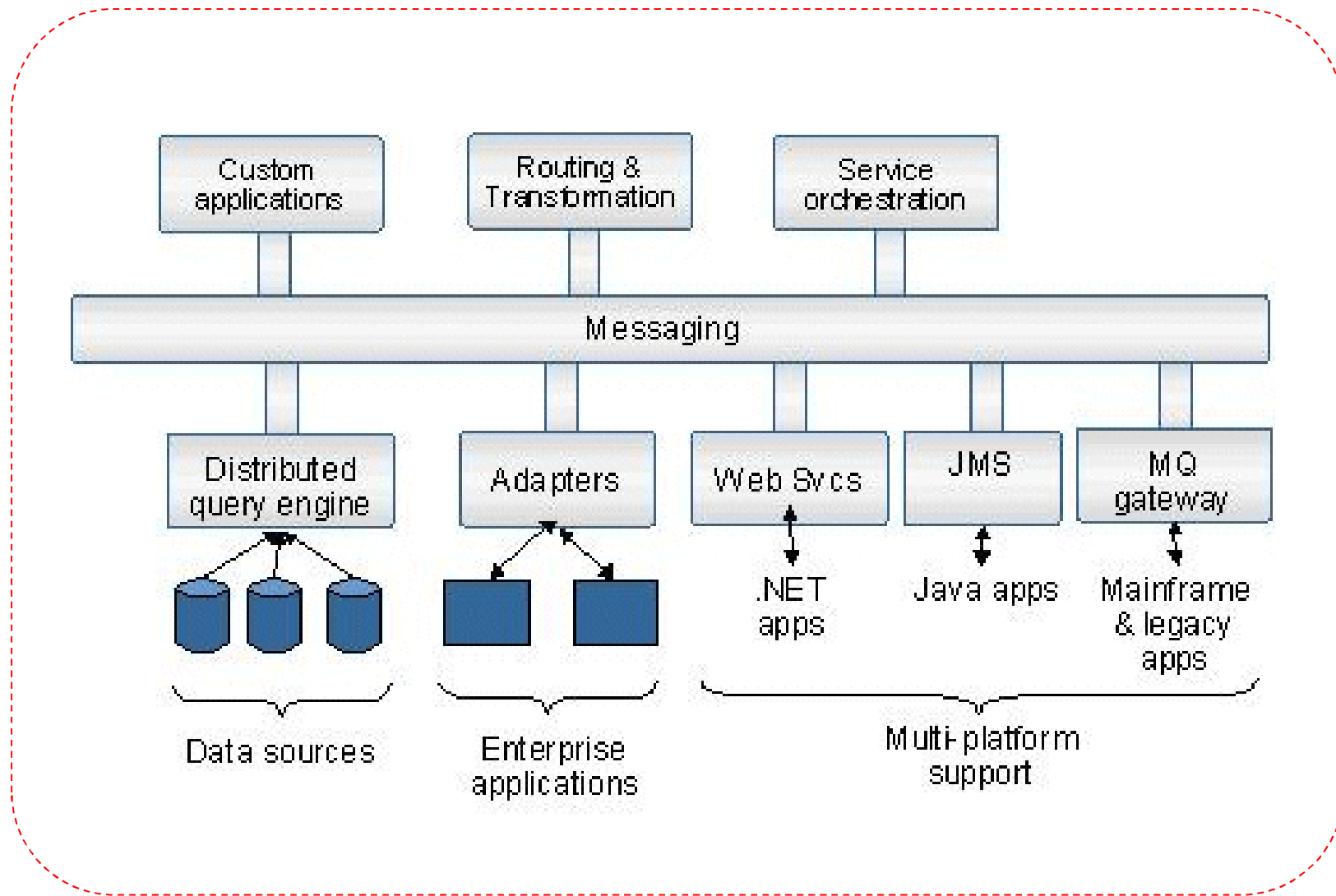


SOA is a method of designing and developing software in the form of interoperable services.

SOA for Interoperation

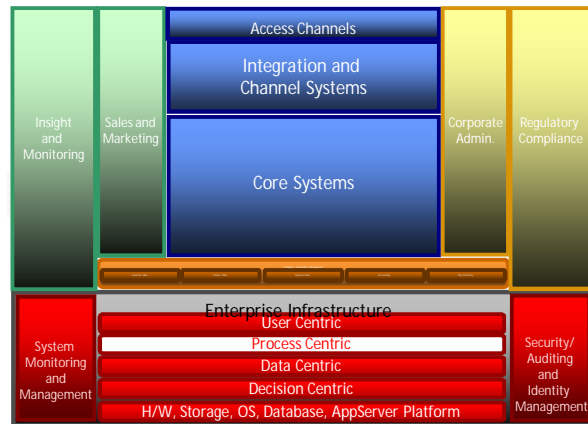


Enterprise Service Bus



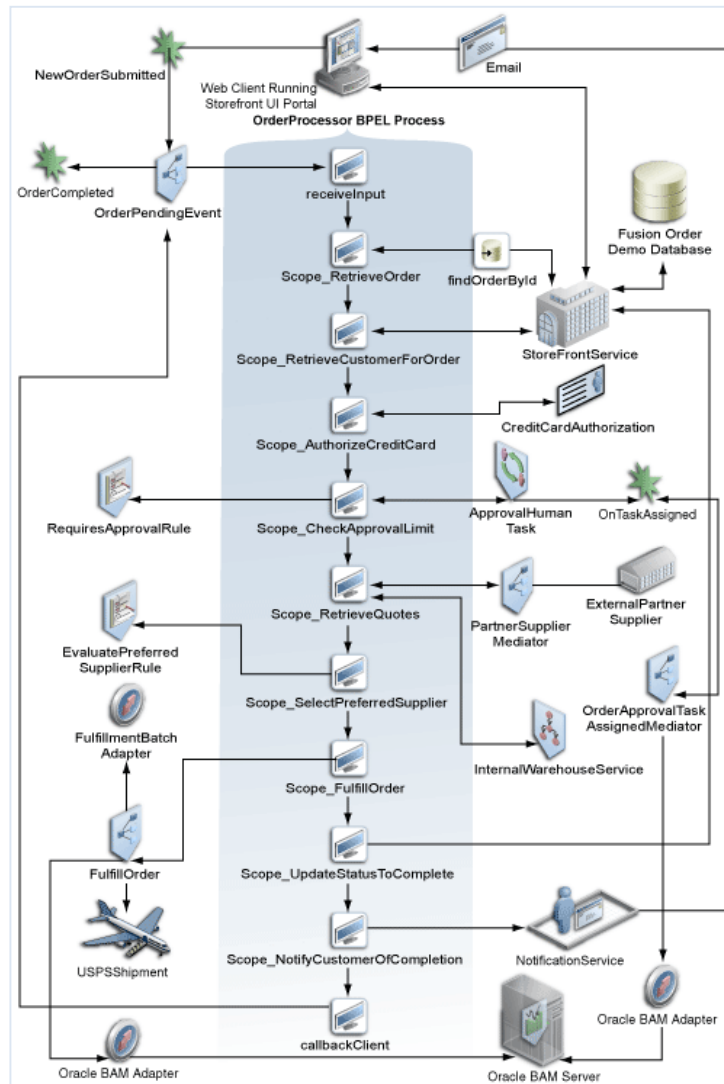
Technology Standard and Key Consideration

Process Integration Layer



- BPMN 2.0 aware system
- Business Process Execution Language
- Standard Workflow Patterns (FYI., Sequential, Vote, Delegation, Reassignment, etc.)
- XML Workflow Application
- Process Simulation
- WSDL
- SOAP, REST (Representational State Transfer)
- UDDI (Universal Description Discovery and Integration)
- Side-By-Side Versioning in Runtime

Process Integration with BPEL



BPEL is an XML-based language for describing a business process in which most of the tasks represent interactions between the process and external Web services. The BPEL process itself is represented as a Web service, and is realized by a BPEL engine which executes the process description.

BPMN is a standard set of diagramming conventions for describing business processes and to be export into BPEL format.

Enterprise Workflow Application

Task Form Display

Current Template: **ThreeRegionJSP**

Section: Rendering: Source

Header: **Default JSP** **Footer1.jsp**

Body: **Auto JSP** **Body.jsp**

Footer: **Default JSP** **Footer1.jsp**

Help **OK** **Cancel**

Processed successfully.

Purchase Order Approval for Antilla Electronics

Created Date : 05/19/06

Updated Date : 05/19/06 09:32 AM

Expiration Date:

Creator : Antilla Electronics

Acquired By: jcooper

Assignees : Supervisor(U)

Purchase Order

Cust ID * **Antilla Electronics** string

ID * **AS-0193** string

Name

First * **DeGossaa** string

Last * **Calro** string

Address

Street * **12, Burhon Street** string

City * **Danzig** string

State * **Godanzk** string

Zip * **PO-20398** string

Country * **Poland** string

Name

First * **Mrs** string

Last * **Castro** string

Oracle BPEL Worklist - Microsoft Internet Explorer

Address: <http://localhost:9700/integration/worklistapp/TaskList>

Acme Inc

Search: My & Group Any Assigned Go

Home (My & Group Tasks)

Number	Title	Status	Assignee	Expiration Date	Actions
10096	Add Router in Engineering	Assigned	jstein (U)	Apr 8, 2005 11:00 PM	-- Select an Action --
10097	Add LAN Ports in Sales Conference	Assigned	jstein (U)	Apr 3, 2005 12:00 AM	-- Select an Action --
10098	Add Network Capacity in Chicago Field Office	Assigned	jstein (U)	Apr 4, 2005 11:00 PM	-- Select an Action --
10099	Add Firewall in Sales Demo Hosting	Assigned	jstein (U)	Apr 8, 2005 11:00 PM	-- Select an Action --
10100	Add Router in QA Lab	Assigned	jstein (U)	Apr 8, 2005 11:00 PM	-- Select an Action --

[1 - 5] [Next](#)

Page refreshed on Mar 30, 2005 1:05 PM

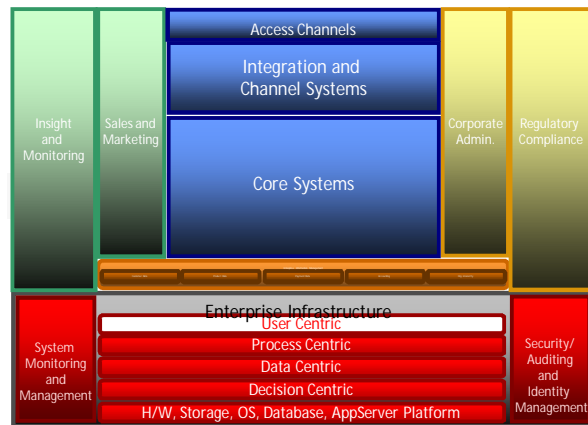
My & Group Tasks Chart

Status	Count
Assigned	6
Completed	1
Expired	0
Total	7

Local intranet

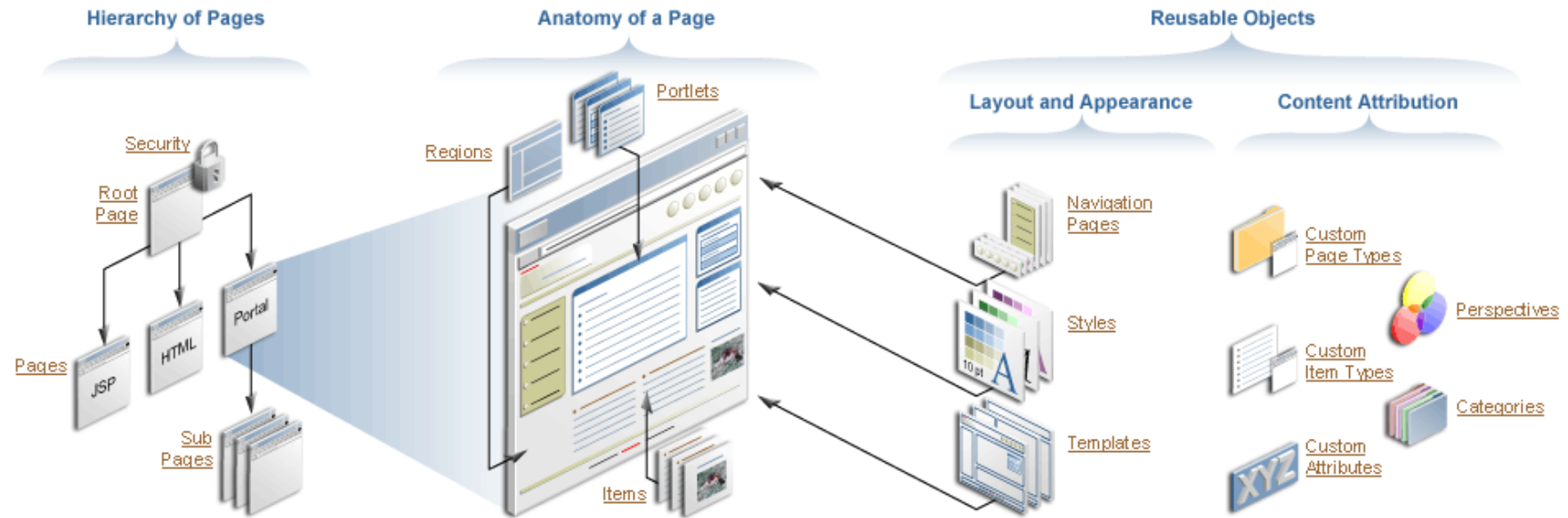
Technology Standard and Key Consideration

User Interface and User Collaboration Layer



- Open User Interface Development Framework; JSF, etc.
- Event Driven UI; JSF, .NET, etc.
- XML UI with Data Binding; JSF, ADF, Taglibs, etc.
(enable you to render in graph, table, map)
- Calendar and Holiday Aware System; .ics, etc.
- Metadata Management
- Search Capability; Thai
- Present Technology over HTTP

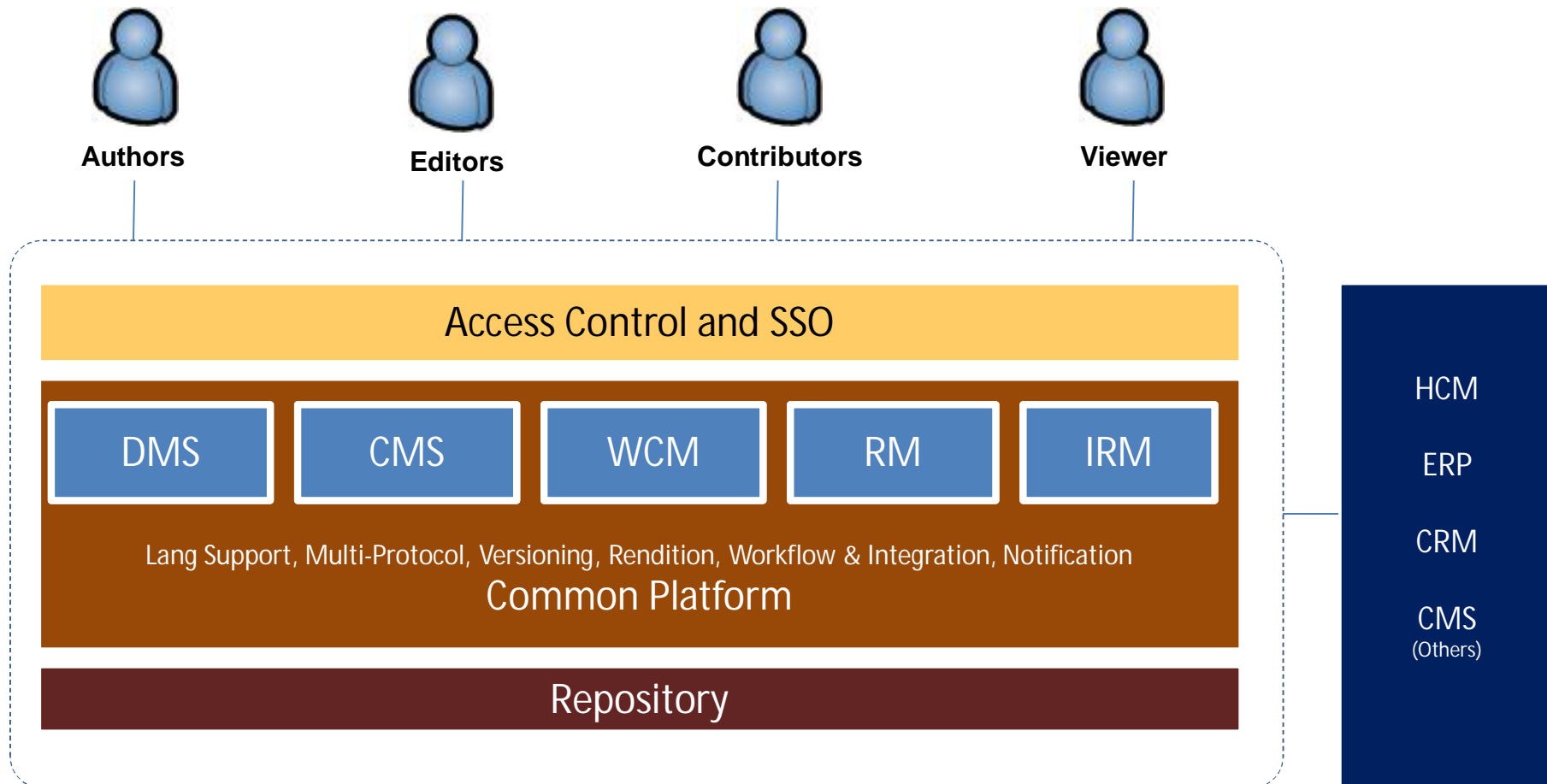
Web Portal Anatomy



ECM General Practices

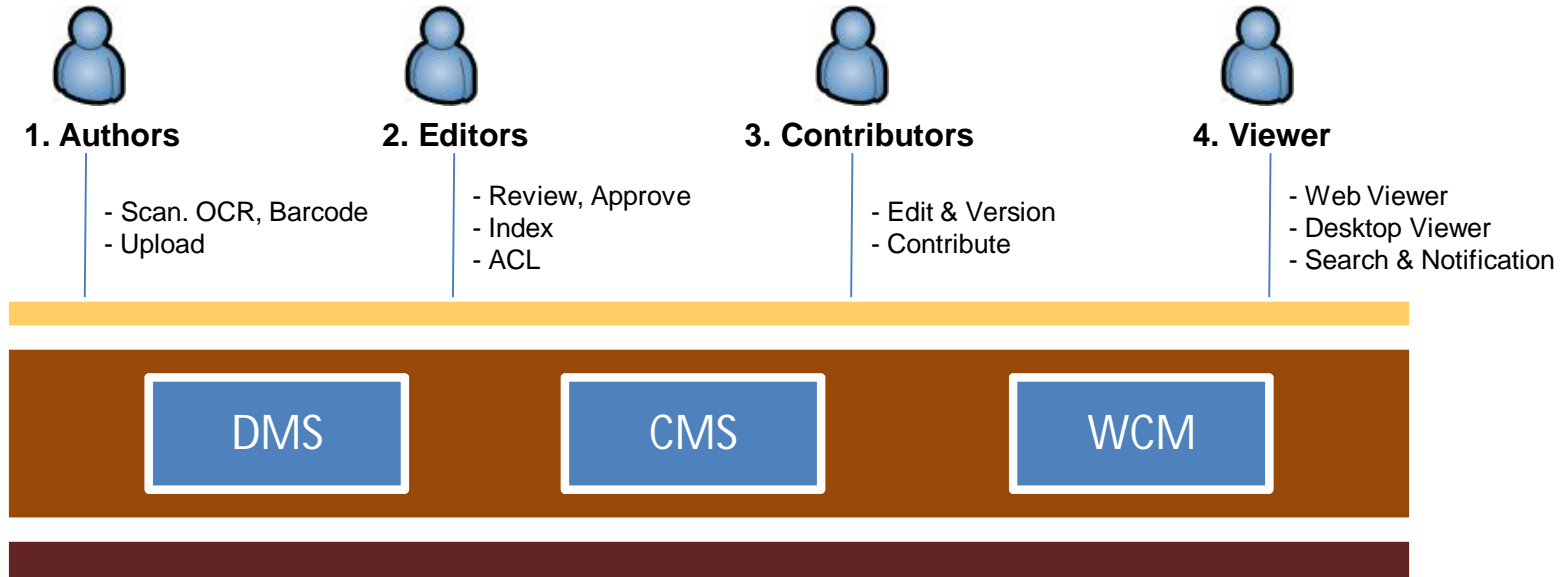


The ECM Solution Architecture



ECM Best Practices

#1. Document Scan and Search Solution

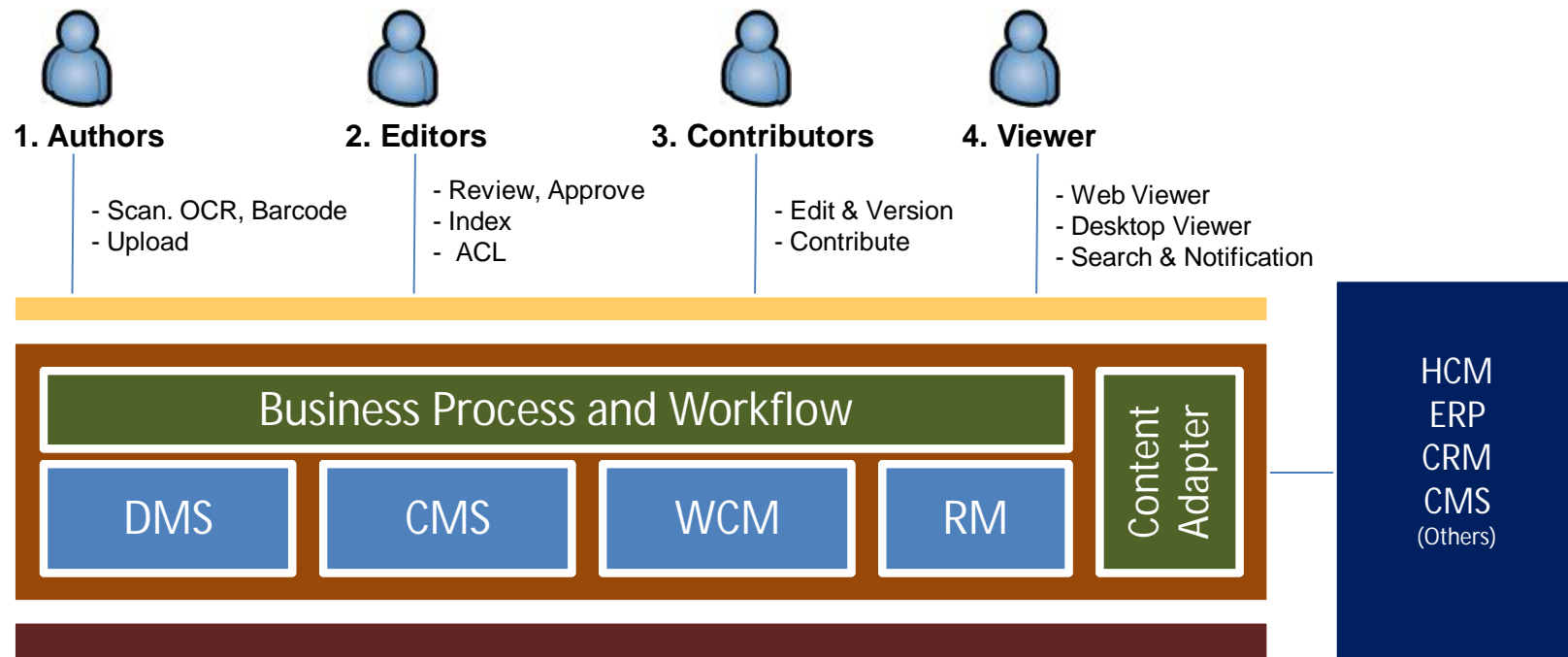


Best Practices

1. Identify User Access Controls/Roles (Editors, Contributors, Viewers)
2. Language support both keywords and full text
3. Scan feeder, OCR and automatic document classification
4. Content transformation to Web Documents (PDF, HTML and JPG)
5. Content versioning with change alert/notification, Usage tracking
6. 2-8 months project implementation timeframe

ECM Best Practices

#2. ECM and Business Process Integration



Best Practices

1. HCM, ERP, CRM Integration solution
2. Standard BPEL with calendar aware approval process
3. ECM Single Sign On and Portlet Solution
4. Record and Retention management with Content server Adapters
5. Content versioning with change alert/notification
6. 4-8 months project implementation timeframe

ECM Best Practices

#3. Secured Content Distribution

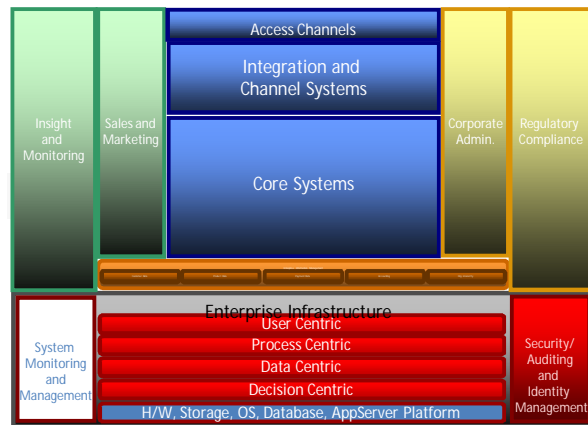


Best Practices

1. Information Rights Management
2. Web Content Management
3. Standard BPEL with security integration solution if needed
4. Content versioning with change alert/notification
5. 3-4 months project implementation timeframe

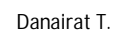
Technology Standard and Key Consideration

Monitoring and Management



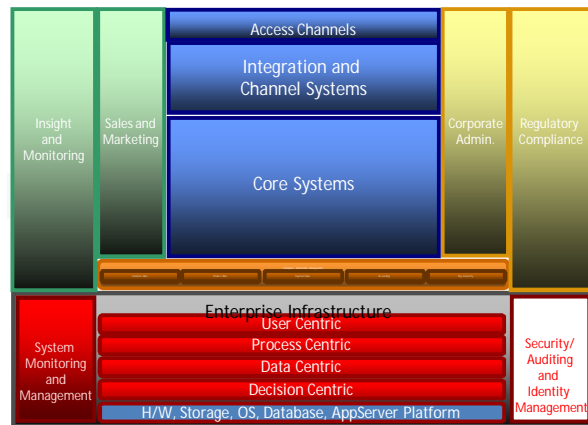
- Simplistic as possible
- Segregation of Monitoring and Management
- JMX; Java Management Extension
- SNMP support
- Text, Graphical with actionable support
- Information Correlation support

Various Technologies in open communication protocol and standard operation procedure



Technology Standard and Key Consideration

Security Auditing and Identity Management

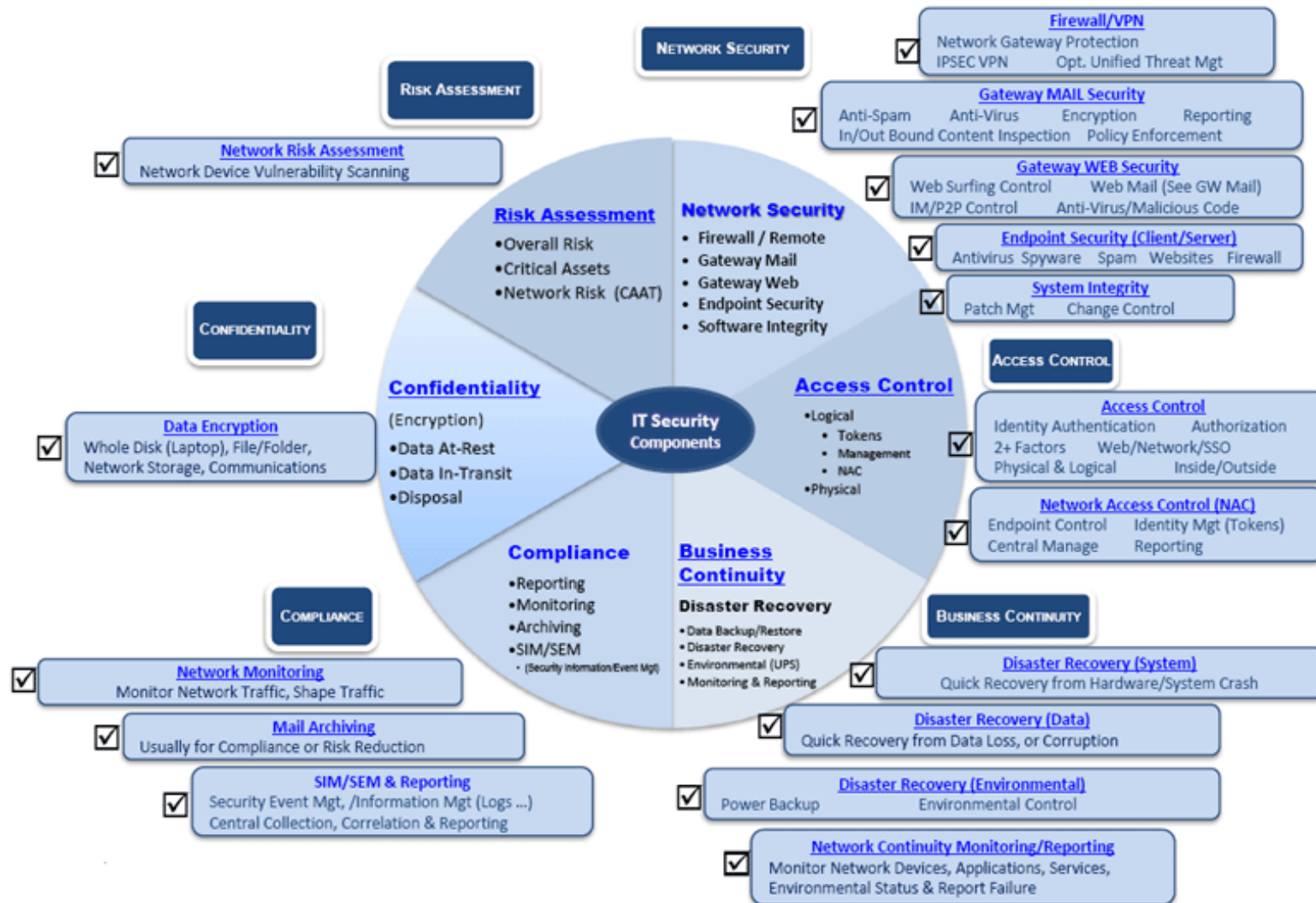


- Access Control and Authorization Server
- Encryption Mechanism
- Key Management Support
- Non-Repudiation Support
- Enterprise Roles Management
- User Roles and Accounts Provisioning
- SAML for IdM Federation

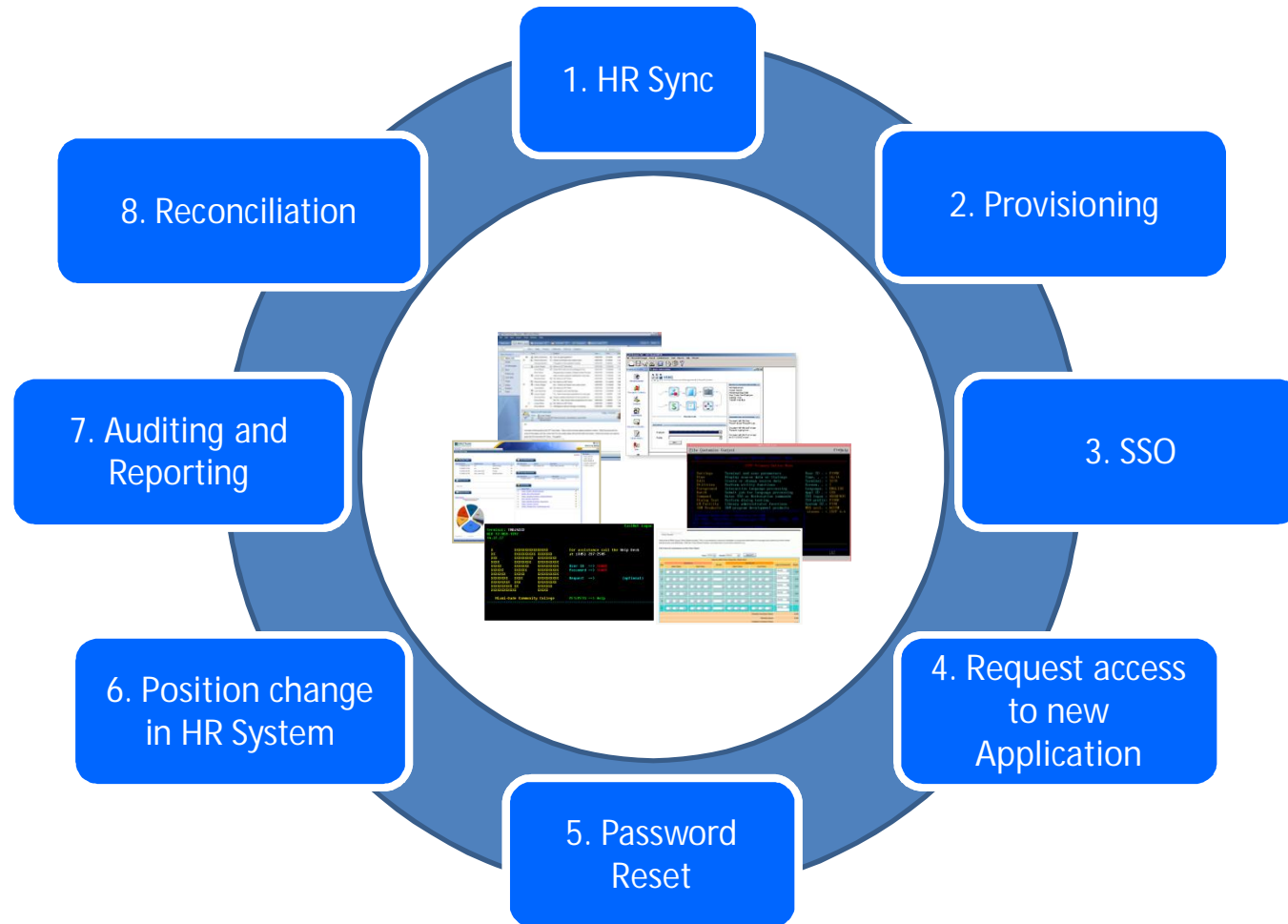
IT Security Overview



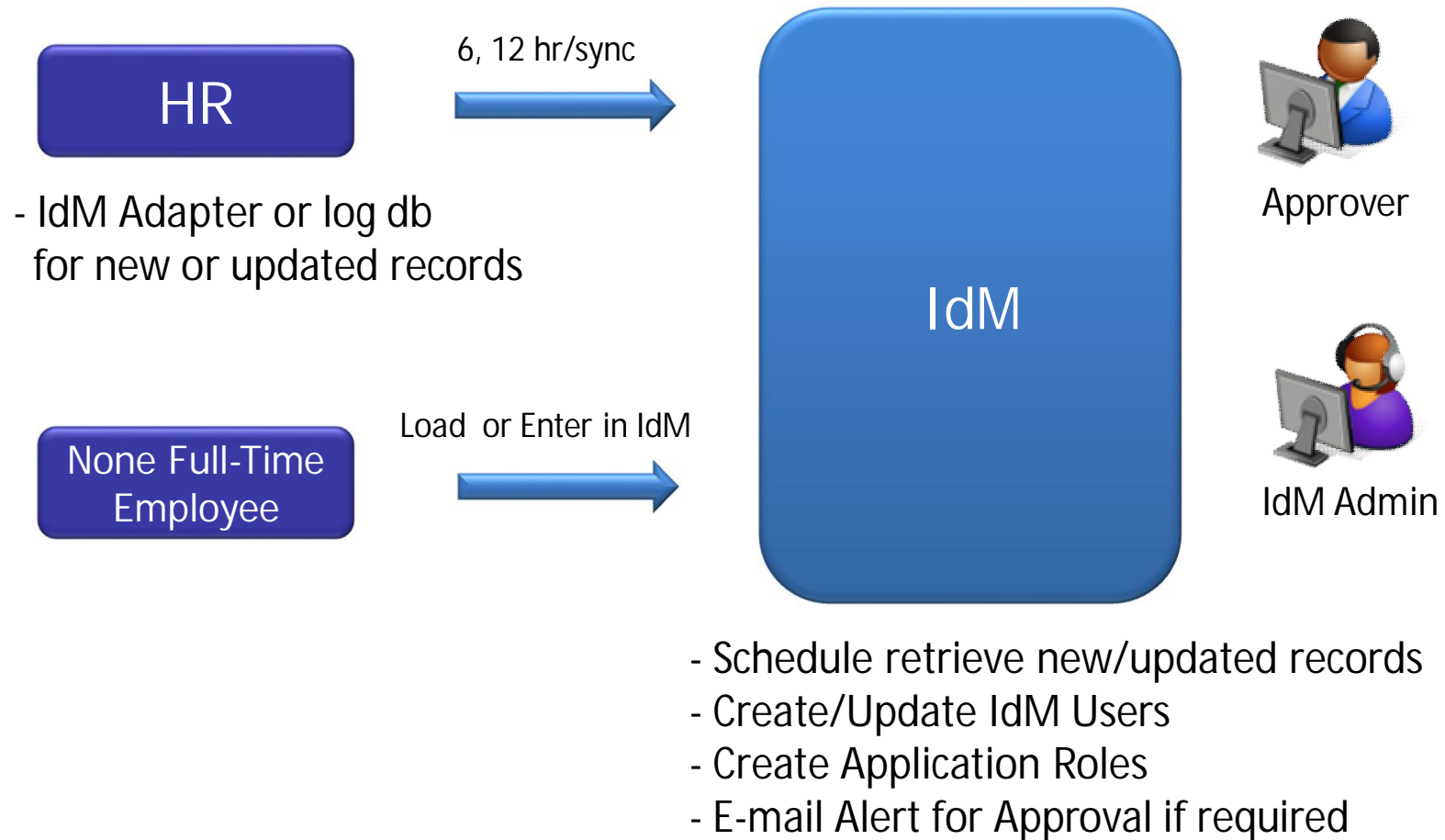
IT Security Overview



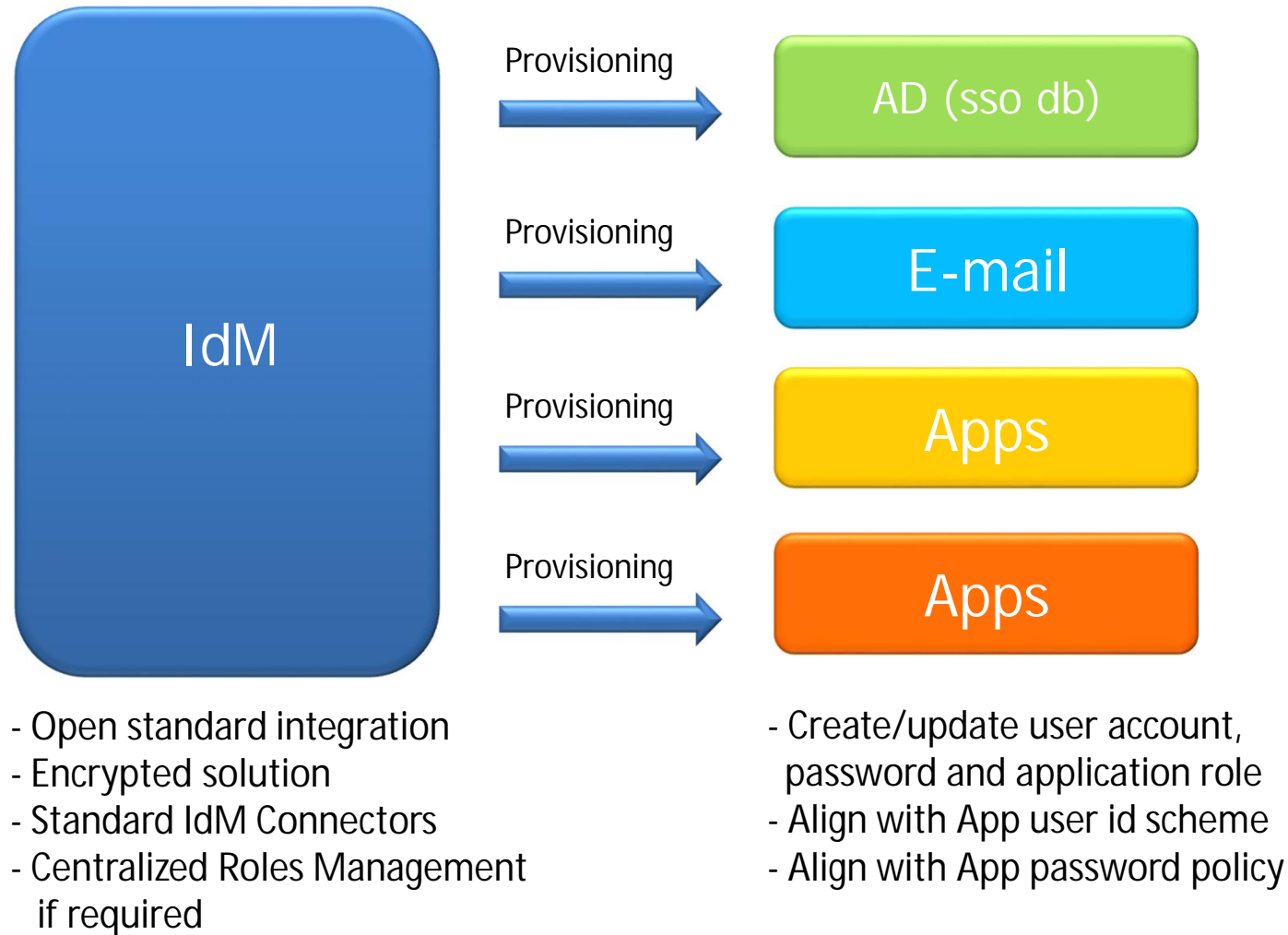
IdM and SSO Best Practices



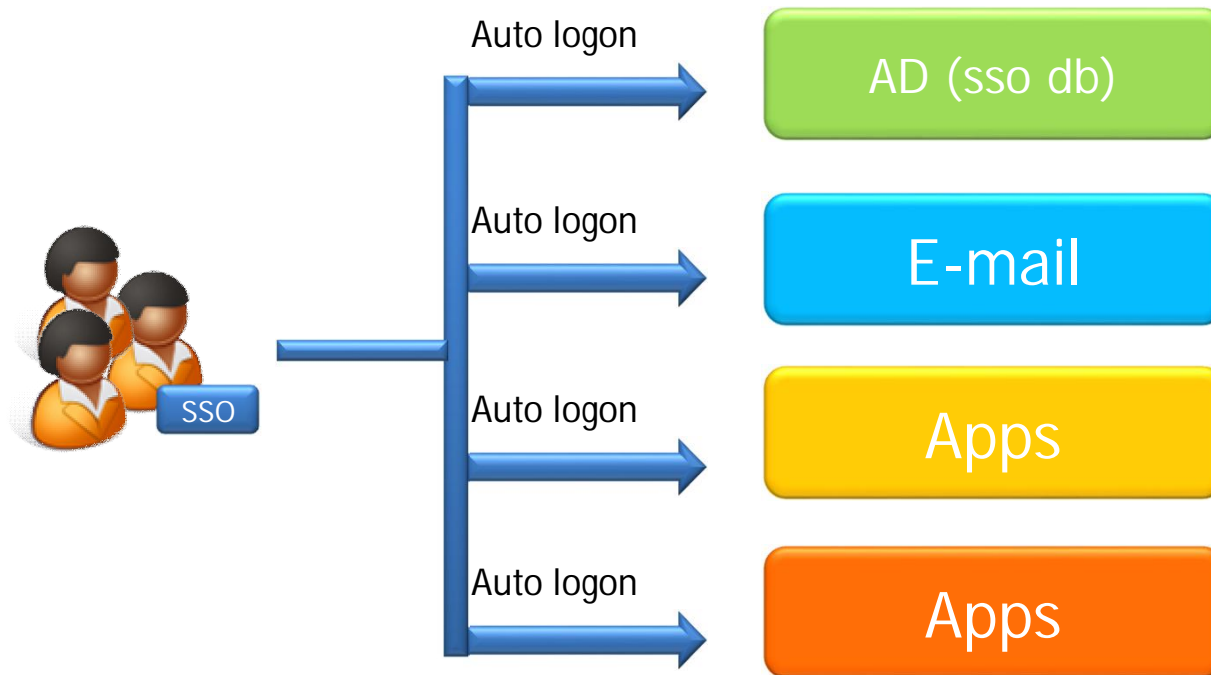
1. HR Sync



2. Provisioning

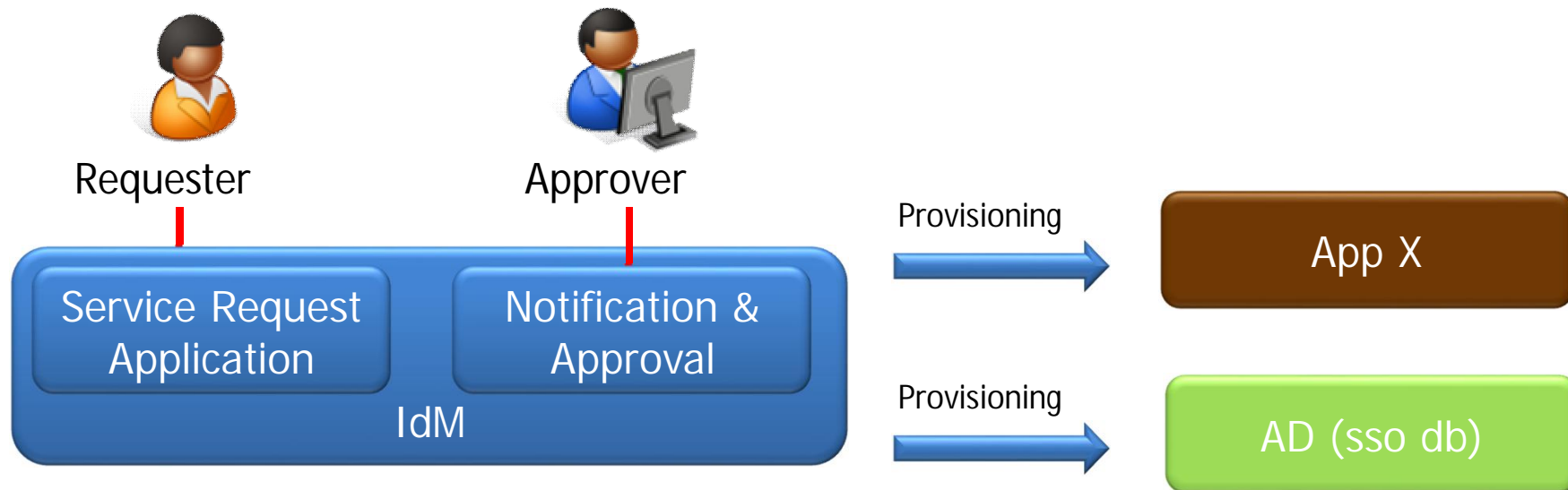


3. SSO



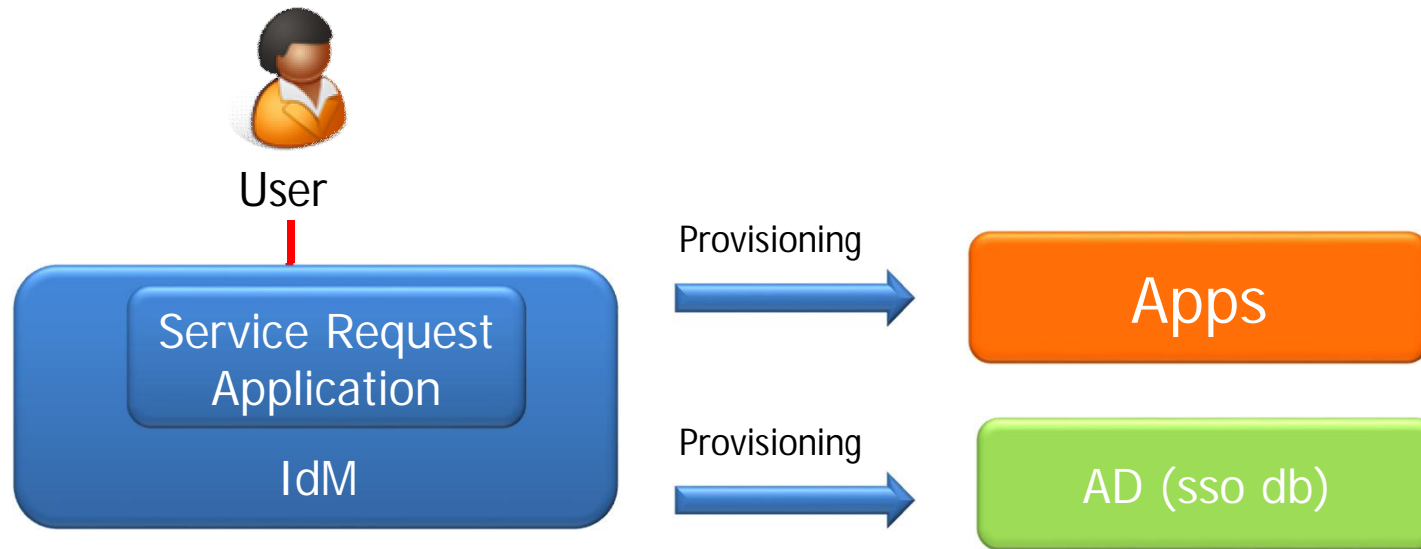
- Around 12 mb size of sso client for non web application
- Encrypted wallet with proven in 15 million deployment users
- Disconnected support with encrypted mechanism
- Re-login support for very secured application

4. Request access to new Application



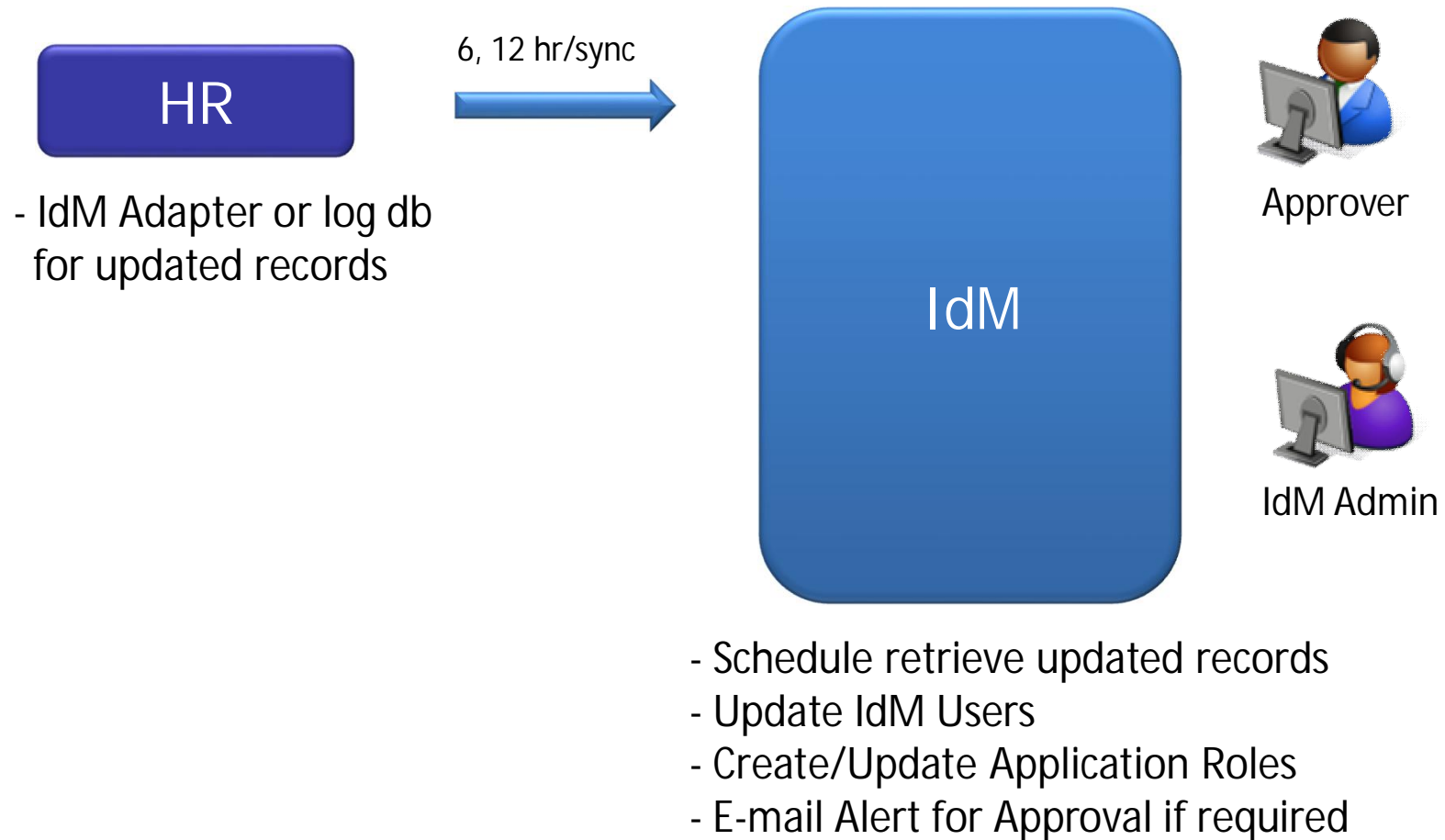
- The "Service Request Form" can be in Thai and do both create/update account and application role
- Organization chart aware application or parameterized approver
- Requester can be manager or co-officer
- Standard SOA process management tool

5. Password Reset



- Users can be able to reset applications password via IdM “Service Request Application”
- Required end-user training to familiar with “Service Request Application”
- If any pop up in application for expired pwd the SSO will detect the screen and facilitate password change

6. Position change in HR System



7. Auditing and Reporting



How many roles in Mr.A?



Who has this role?



How many users in App?

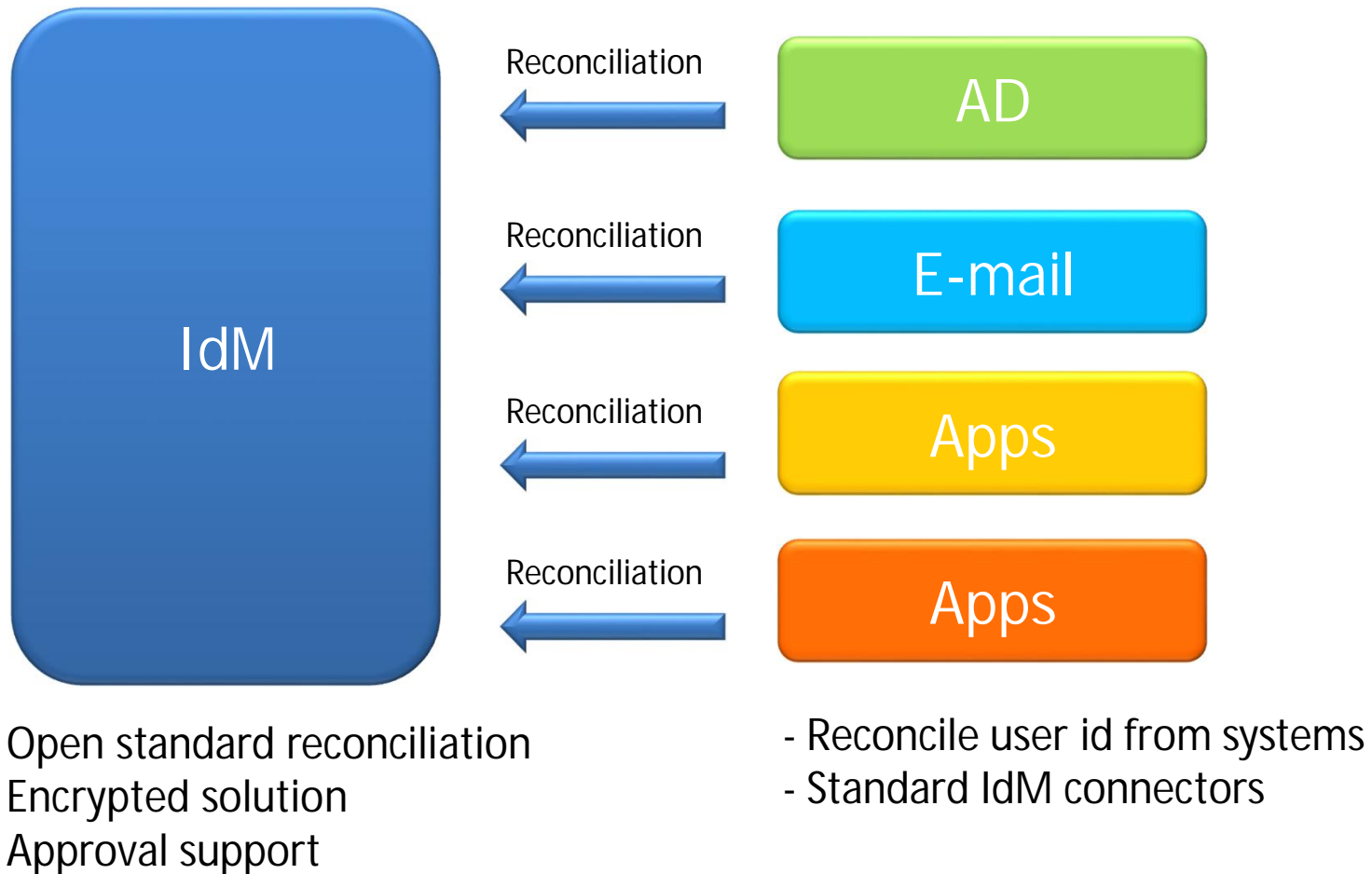


Success and Fail Logon

IdM

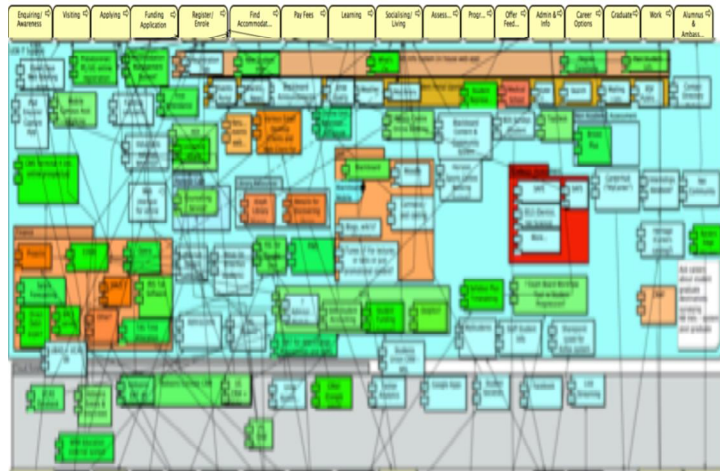
- Real-time Capture when change in account, role, application
- Usage Reporting from SSO eg. Success and Fail logon
- SNMP or window event support

8. Reconciliation



IT Architecture Improvement

Current and Target State

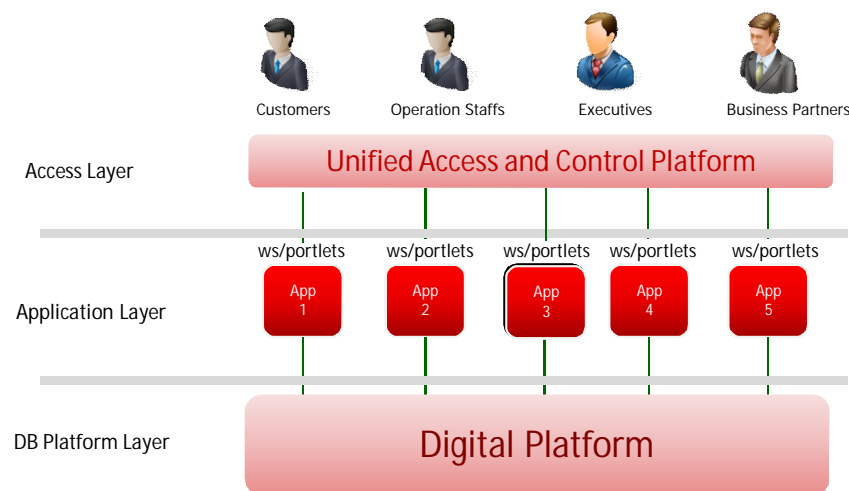
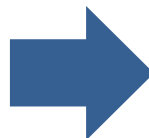
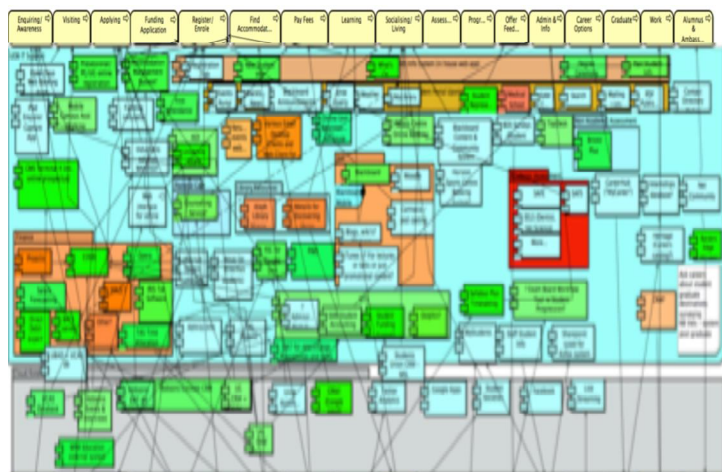


Current Technology Architecture

- เพิ่มบริการใหม่ๆยาก
- ต้องใช้ต้นทุนสูงในการขยายระบบ
- ใช้เวลามากในการแก้ปัญหา
- เกิดความเสี่ยงสูงต่อการดำเนินธุรกิจ

Technology Architecture Improvement

Current and Target State



Current Technology Architecture

- เพิ่มบริการใหม่ๆยาก
- ต้องใช้ต้นทุนสูงในการขยายระบบ
- ใช้เวลามากในการแก้ปัญหา
- เกิดความเสี่ยงสูงต่อการดำเนินธุรกิจ

Target Technology Architecture

- สร้าง common platform
- เพิ่มความยืดหยุ่นให้กับเงื่อนไขบริการใหม่
- สามารถผลิต application ได้เร็วขึ้น
- ลดความเสี่ยงต่อการดำเนินการ

Technology Architecture Maturity Level

Technology Architecture Maturity Level

0 Non-existent when

Managing the technology infrastructure is **not recognized** as a sufficiently important topic to be addressed.

1 Initial/Ad Hoc when

There are changes made to infrastructure for every new application, without any overall plan. Although there is an awareness that the IT infrastructure is important, there is no consistent overall approach.

Maintenance activity reacts to short-term needs. The production environment is the test environment.

2 Repeatable but Intuitive when

There is a consistency amongst tactical approaches when acquiring and maintaining the IT infrastructure.

Acquisition and maintenance of IT infrastructure are not based on any defined strategy and do not consider the needs of the business applications that must be supported. There is an understanding that the IT infrastructure is important, **supported by some formal practices**. Some maintenance is scheduled, but it is **not fully scheduled and co-ordinated**. For some environments, a separate test environment exists.

3 Defined when

A clear, defined and generally understood process exists for acquiring and maintaining IT infrastructure. The process supports the needs of **critical business applications and is aligned to IT and business strategy, but it is not consistently applied**. Maintenance is planned, scheduled and co-ordinated. There are separate environments for test and production.

Technology Architecture Maturity Level

4 Managed and Measurable when

The acquisition and maintenance process for technology infrastructure has developed to the point where it works well for most situations, is followed consistently and is focused on reusability. The IT infrastructure adequately supports the business applications. The process is well organized and proactive. The cost and lead time to achieve the expected level of scalability, flexibility and integration are partially optimized.

5 Optimized when

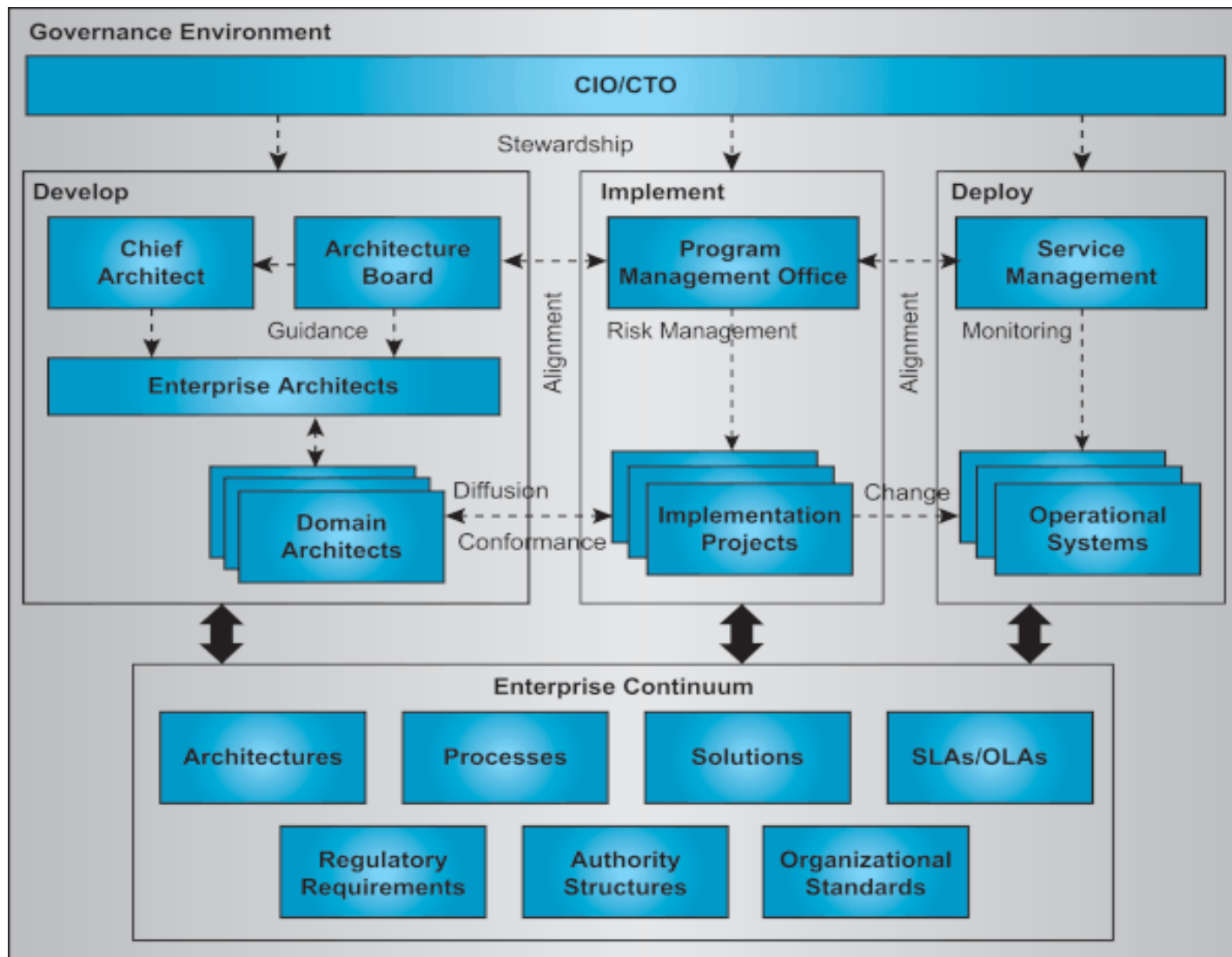
The acquisition and maintenance process for technology infrastructure is proactive and closely aligned with critical business applications and the technology architecture. Good practices regarding technology solutions are followed, and the organization is aware of the latest platform developments and management tools. Costs are reduced by rationalizing, standardizing, optimizing infrastructure components and by using automation. A high level of technical awareness can identify optimum ways to proactively improve performance, including consideration of outsourcing options. The IT infrastructure is seen as the key enabler to leveraging the use of IT.

Enterprise Architecture Governance

Why do we need Governance in EA?

- To enable Business/IT alignment via architecture development
- To guide compliance with the organization's EA Architecture Vision, Strategic Roadmap, Architecture Principles and Standards
- To promote usage of a common architecture framework, process, models, tools & best practices
- To facilitate collaboration and reuse across Architecture initiatives
- To monitor & measure the success of EA Initiatives

Governance Environment (TOGAF)



Source: TOGAF

EA Governance Addresses 3 Questions

1. What decisions need to be made?
 - Decisions about major IT domains
2. Who should make those decisions?
 - Rights are exercised in different governance styles
3. How will these decisions be made and measured?
 - Multiple mechanisms make governance work

1. What decisions need to be made?


The Key IT Domains and Decisions for EA Governance

Related Term	IT Domain	Governance Decision Description	Origin
Business Capabilities & Solutions	Business Application Needs	Business applications to be acquired or built	Earl 1993
Architecture Principles	IT Principles	High level statements about how IT is used in the business	Davenport, Hammer & Metsisto 1989 Broadbent & Weill 1997
Investment via Business Case	IT Investment and Prioritization	Decisions about how much and where to invest in IT including project approvals and justification techniques	Devaraj & Kohli 2002 Ross & Beath 2002
Architecture Vision & Strategic Roadmap	IT Architecture	An integrated set of technical choices to guide the organization in satisfying business needs. The architecture is a set of policies and rules that govern the use of IT and plot a migration path to the way business will be done (includes data, technology, and applications)	Keen 1989 Weill, Subramani & Broadbent 2002
IT Strategy	IT Infrastructure Strategies	Strategies for the base foundation of budgeted-for IT capability (both technical and human), shared throughout the firm as reliable services, and centrally coordinated (e.g., network, help desk, shared data)	Keen 1995 Ross 2003

© 2003 MIT Sloan Center for Information Systems Research (CISR).

2. Who should make those decisions?

Decisions are exercised in six governance styles

Style	Who makes the decisions?	CxO Level Execs	Corp. IT and/or BU IT	BU Leaders and/or Bus. Proc. Owners	 <div>More</div> <div>Centralized</div> <div>Less</div>
Business Monarchy	C-level executives, as a group or individuals, including the CIO (but not acting independently)	x			
IT Monarchy	Individuals or groups of IT executives		x		
Feudal	Business unit leaders or their delegates			x	
Federal	C-level executives and at least one other business group (e.g., CxO or BU leaders)	x	x	x	
Duopoly	IT executives and at least one other business group (e.g., CxO or BU leaders)	x	x	x	
Anarchy	Each individual business process owner or end user				

© 2003 MIT Sloan Center for Information Systems Research (CISR).

3. How will these decisions be made and measured?

Many mechanisms make governance work

<i>Governance Mechanisms</i>	<i>Objective</i>
<i>Executive committee</i>	Take a holistic view
<i>IT council of business, IT executives</i>	Focus on driving value
<i>IT leadership committee</i>	Coordinate across the enterprise
<i>Architecture committee</i>	Identify strategic technologies
<i>Business / IT relationship managers</i>	Ensure feedback, good iteration
<i>Process teams with IT members</i>	Take a process view
<i>Service-level agreements</i>	Specify, measure IT services
<i>Chargeback arrangements</i>	Shape behavior, recoup costs

Adapted from Weill and Woodham, 2002; M. Broadbent & P. Weill, *Leading Governance, Business and IT Processes*, ITEP Findings, 1998

Responsible, Accountable, Consulted, Informed Matrix

<i>Purpose</i>	The RACI matrix is used define roles and responsibilities. In general, you match up roles and responsibilities with processes.
<i>How to Use the Artifact</i>	<ul style="list-style-type: none">• The RACI matrix is a useful tool when rolling out a new change management program, or just uncovering the processes that make your organization function and identifying the participation in those processes• The RACI matrix uses the following notation:<ul style="list-style-type: none">• Responsible (R): owns the project/problem• Accountable (A): to whom “R” is accountable who must sign off (approve) on the work before it is effective.• Consulted (C): has information and/or capability necessary to complete the work.• Informed (I): must be notified of the results but need not be consulted.
<i>Audience</i>	<ul style="list-style-type: none">• Executive Stakeholders• Line of Business Executives• IT Executives• IT Leads

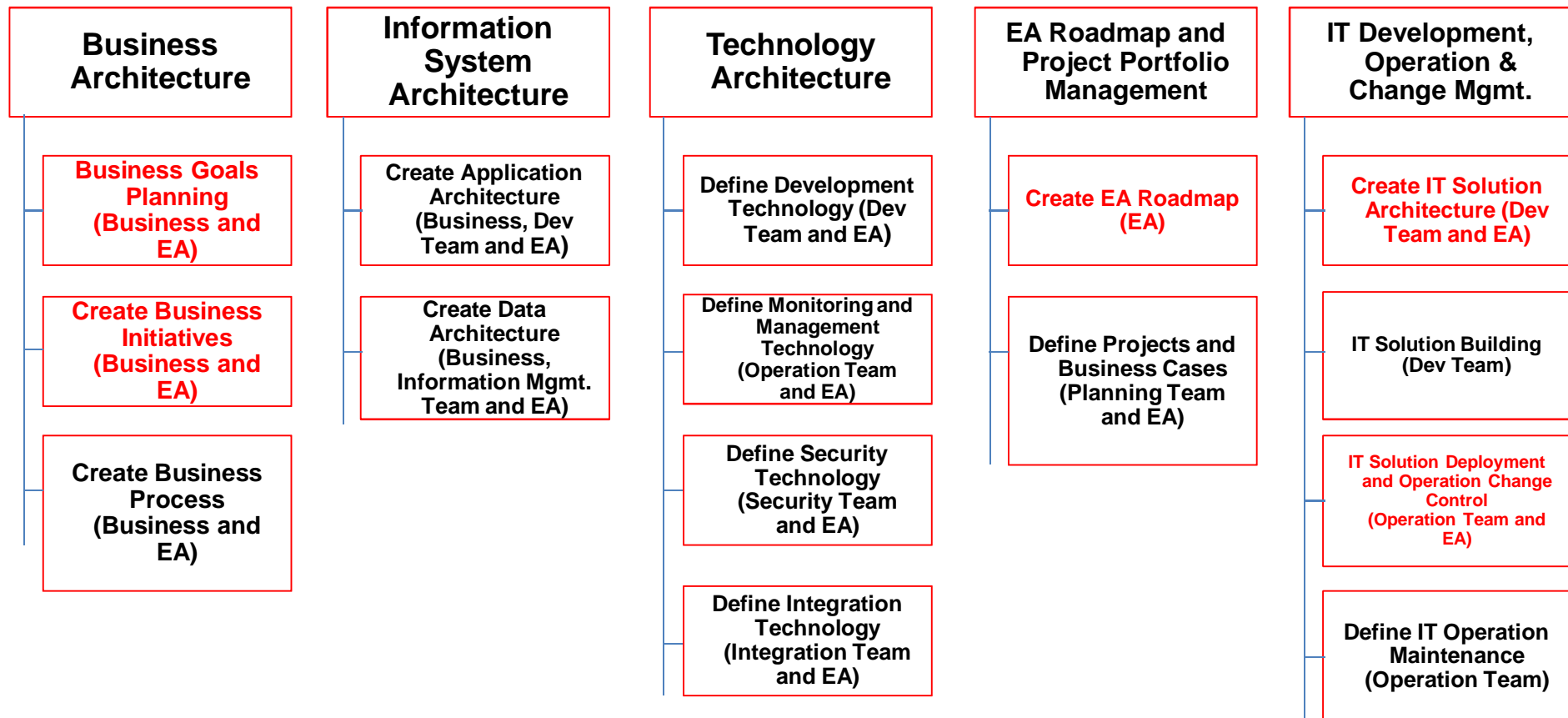
EA Governance RACI Matrix

Artifact Example

Architecture Implementation Governance				
	Steering Committee	PMO	EA Board	Project Teams
Provide Communication & Awareness and of standards & assets	I	C	A & R	C
Conduct Coherence & Compliance Reviews	I	C	A & R	I
Provide cross-project Communication and Guidance	I	A	R	I
Escalation Resolution	A & R	C	C	I
Allowance for Deviation and Dispensation	I	A	R	I
Define Degree of EA team engagement	I	R	A	C
Identify Resource Capability & Capacity	I	A & R	C	C
Update Architecture Repository & Capture change requests	I	C	A	R

Responsible, Accountable, Consulted, Informed

Enterprise Architecture Governance Process



Red Color is EA main involve process

Business Goals Planning and Business Initiatives

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Create Business Goals	A/R	R	C	I	I	I	I
↓							
Business Operation Model/ Business and IT Capability	A/R	R	C	C	C	I	I
↓							
Business Objectives	A/R	R	C	I	I	I	I
↓							
Create Business Initiatives	C	A/R	C	C	C	I	I

Responsible, Accountable, Consulted, Informed

Create Business Processes

Activities and Deliverables	Business Executives	Business Process/ Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Develop Baseline Business Process Description	C	A/R	C	I	I	I	I
↓							
Develop Target Business Process Description	C	A/R	C	I	I	I	I
↓							
Perform Gap Analysis	C	A/R	C	I	I	I	I
↓							
Provide requirements to the Data, Application, and Technology Architectures	C	A/R	C	C	C	I	I
↓							
Finalize the Business Process	C	A/R	C	I	I	I	I

Responsible, Accountable, Consulted, Informed

Create Application Architecture

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Application Architecture Strategy (Consolidate, Plug and Play Strategy)	I	R	C	C	C	A/R	C
↓							
Create Application Portfolio Baseline (Application Landscape)	I	R	C	C	R	A/R	R
↓							
Business Processes and Application Dependencies	I	A/R	I	I	I	R	I
↓							
Relationship to Application Capability Increments Transitioning	I	R	C	C	C	A/R	C

Responsible, Accountable, Consulted, Informed

Create Data Architecture

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Data Architecture Strategy (Consolidate, Information as a Service)	A	R	C	C	C	R	C
↓							
Create Enterprise Data Platform (Data Landscape)	A	R	C	C	C	R	R
↓							
Application and Data Dependencies	I	R	I	I	I	A/R (IT Data Management Team)	C
↓							
Relationship to Data Capability Increments Transitioning	I	R	C	C	C	A/R (IT Data Management Team)	C

Responsible, Accountable, Consulted, Informed

Define Development Technology

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Create Standard Development Technology (Open, Unify Tool Set)	I	I	C	C	C	A/R	R
Create Standard User Interaction Development Technology	I	I	C	C	C	A/R	R
Create Standard Business Process Management Development Technology	I	I	C	C	C	A/R	R
Create Standard Application Server and Database Technology	I	I	C	C	C	A/R	R

Responsible, Accountable, Consulted, Informed

Define Monitoring and Management Technology

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Create Standard Monitoring and Management Technology	I	I	C	C	C	R	A/R
↓							
Create Standard Network/Operating System Monitoring and Management Technology	I	I	C	C	C	R	A/R
↓							
Create Standard Database and Application Server Monitoring and Management Technology	I	I	C	C	C	R	A/R
↓							
Create Standard Application Monitoring and Management Technology	I	I	C	C	C	R	A/R

Responsible, Accountable, Consulted, Informed

Define Security Technology

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Create Standard Security Technology ↓	I	I	C	C	C	R	A/R
Create Standard Network/ Operating System Security Technology ↓	I	I	C	C	C	R	A/R
Create Standard Database and Application Server Security Technology ↓	I	I	C	C	C	R	A/R
Create Standard Application Security Technology	I	I	C	C	C	R	A/R

Responsible, Accountable, Consulted, Informed

Define Integration Technology

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Create Standard Integration Technology	I	I	C	C	C	R	A/R
Create Standard Business Transaction Integration Technology	I	I	C	C	C	R	A/R
Create Standard Batch Integration Technology	I	I	C	C	C	R	A/R
Create Standard External Integration Technology	I	I	C	C	C	R	A/R

Responsible, Accountable, Consulted, Informed

Create EA Roadmap

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Business and IT Dependencies	I	I	C	A/R	C	R	R
Relationship to capability increments transitioning	C	I	C	A/R	C	C	C
Relationship to opportunity	C	I	C	A/R	C	C	C

Responsible, Accountable, Consulted, Informed

Define Projects and Create Business Cases

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Identify IT Projects	I	C	A	C	R	R	R
↓							
Provide Business Cases and Business Value	I	C	A	C	R	R	R
↓							
Provide Business Value Measurements	C	A/R	C	C	C	I	I
↓							
Identify Risks and Issue	C	A/R	C	R	R	I	I
↓							
Provide Migration Strategy	C	A/R	C	C	C	C	R

Responsible, Accountable, Consulted, Informed

Create IT Solution Architecture (ABB, SBB)

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Architecture Building Block (ABB)	I	I	C	A/R	I	I	I
↓							
Solution Building Block (SBB)	I	I	C	C	R	A/R	R
↓							
Monitoring and Management Architecture	I	I	C	C	C	C	A/R
↓							
Security Architecture	I	C	C	C	A/R	R	R

Responsible, Accountable, Consulted, Informed

IT Solution Deployment and Operational Change Control

Activities and Deliverables	Business Executives	Business Process/Development Owner	CIO	Enterprise Architect	IT Audit and Control	Head of IT Development	Head of IT Operation
Develop Solution Change Deployment Description and Instruction	I	I	I	I	C	A/R	R
Review and Approve The Changed Solution for Data Center	I	I	A	R	R	C	C
Perform Solution Deployment to Data Center	I	I	I	I	C	R	A/R
Rollback Solution Deployment from Data Center	I	I	I	I	C	R	A/R

Responsible, Accountable, Consulted, Informed

Creating Business Case

Business Case Overview

- **Definition:** A Business Case is used to justify a business decision and the related investment of funds.
- **Characteristics:**
 - A strong business case is aligned with the Client's strategic priorities.
 - Successful business cases are a process of developing consensus across stakeholders.
 - A business case is about getting to "yes" -- it answers the question, "Why" and "Why Now".
 - A clear financial analysis of the investments, benefits and payback period is the most tangible and credible foundation for a business case.

The Value Proposition is explained using the Business Case

Key Elements of a Business Case

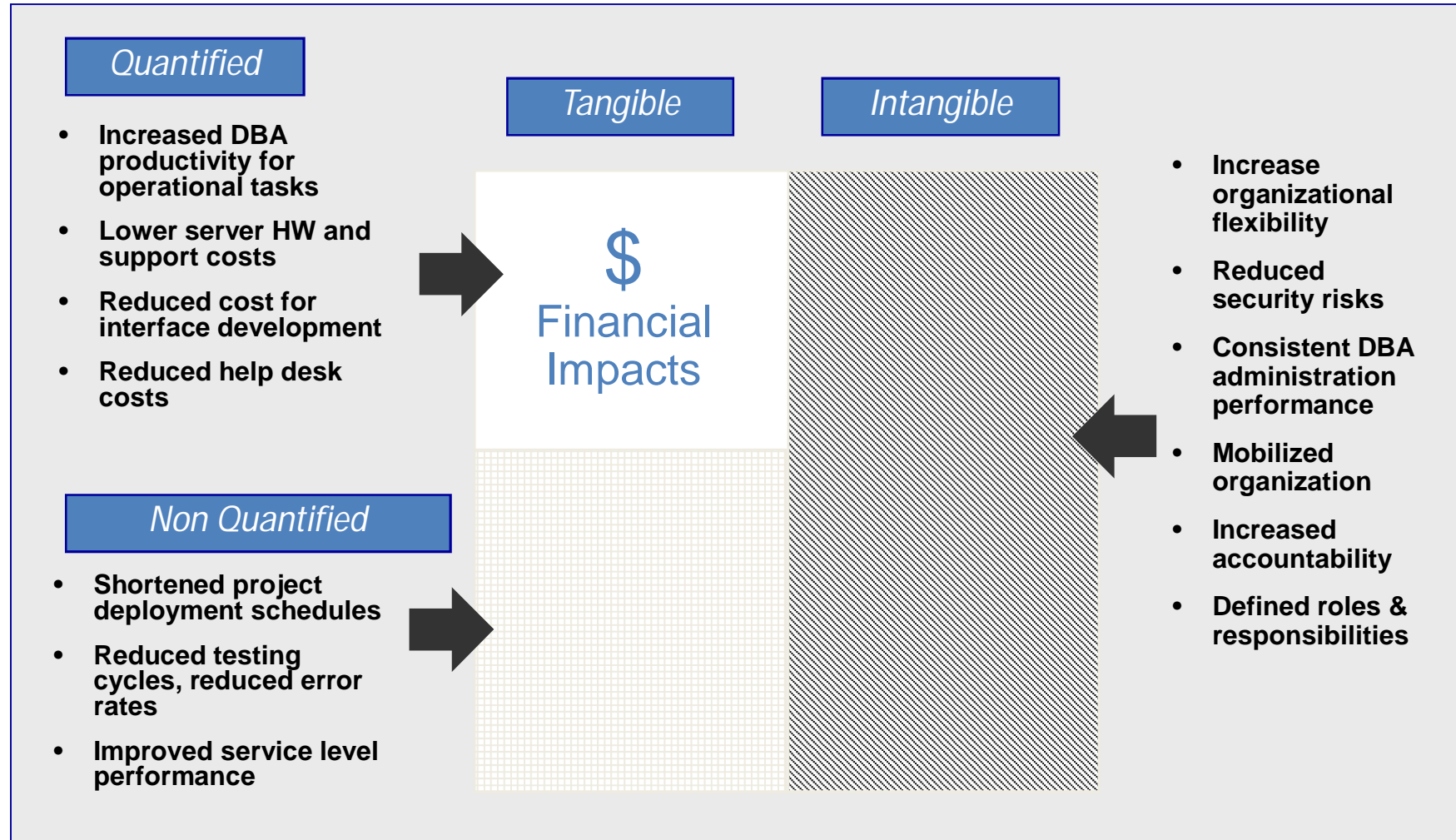
"Show me how this dream will become reality and give me the confidence to invest."

- **Business Challenge:** A clear and well defined business problem provides the foundation of a business case
- **Current State Constraints:** Defines what is lacking in their current environment and the impact of a "business as usual" approach
- **Future State Capabilities:** Defines the Oracle solution to create a vision for the future state; defines the value of leveraging Oracle technology
- **Impacts:** Identifies and quantify the tangible and intangible benefits associated with the future state, ideally linked to unique Oracle enablers
- **Time:** Implementation approach and benefits over time; it is important that the customer understand how they will realize the projected benefits

1. Executive Summary
 - Key Business and IT Issues
2. Current Business State
3. Proposed Course of Action
4. Options Evaluation
 - Tactical
 - Strategic
 - Status-quo ("do nothing")
5. Financial Analysis
6. Management Practices
 - Project Management
 - Risk Mitigation
 - Governance
7. Appendices

Benefit Classification

Ongoing development during Current State, Future State and Roadmap Phases



Risk Analysis / Risk Mitigation Overview

Risk Analysis: is the planning process where you identify the types, probability and severity of the risks that might happen on a project

Risk Mitigation: is the plan for what to do about the risks identified by Risk Analysis. This can include a combination of plans for:

- Risk avoidance: minimize the potential for those risks to materialize
- Mitigation: of the consequences: minimize the severity of risks if they do occur
- Risk acceptance: be ready to deal with risks when they occur
- Risk transfer: let someone else bear the risk for you, someone who can handle it better

Risk Management Model		Probability		
		Low	Medium	High
Impact	Severe/Critical	Substantial management required	Must monitor and manage risks	Extensive management crucial
	Moderate	May accept risks but monitor them	Management effort useful	Management effort required
	Limited/Minor	Accept risks	Accept risks but monitor them	Monitor and manage risks

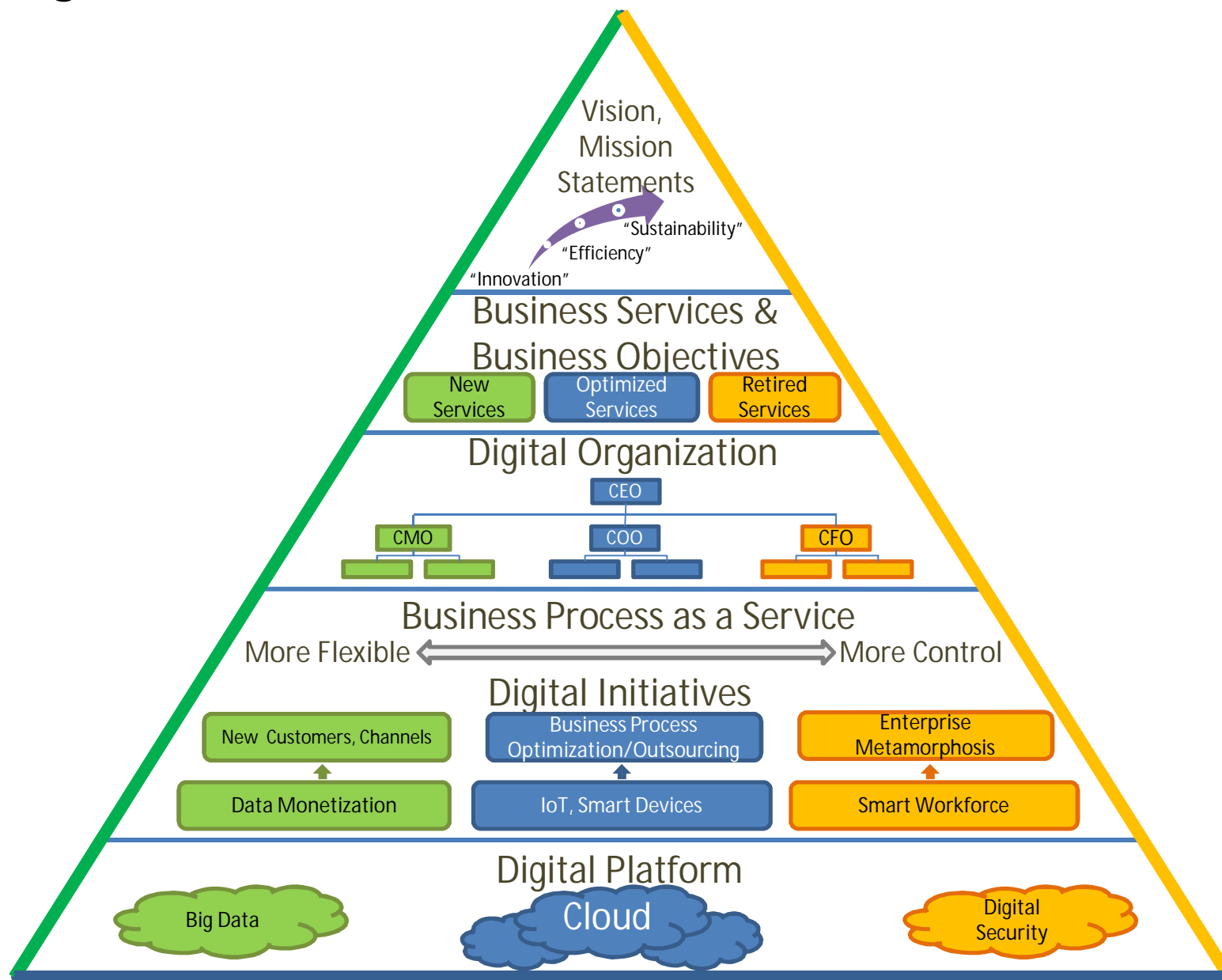
Risk Mitigation Template

Assess and Recommend Risk Management

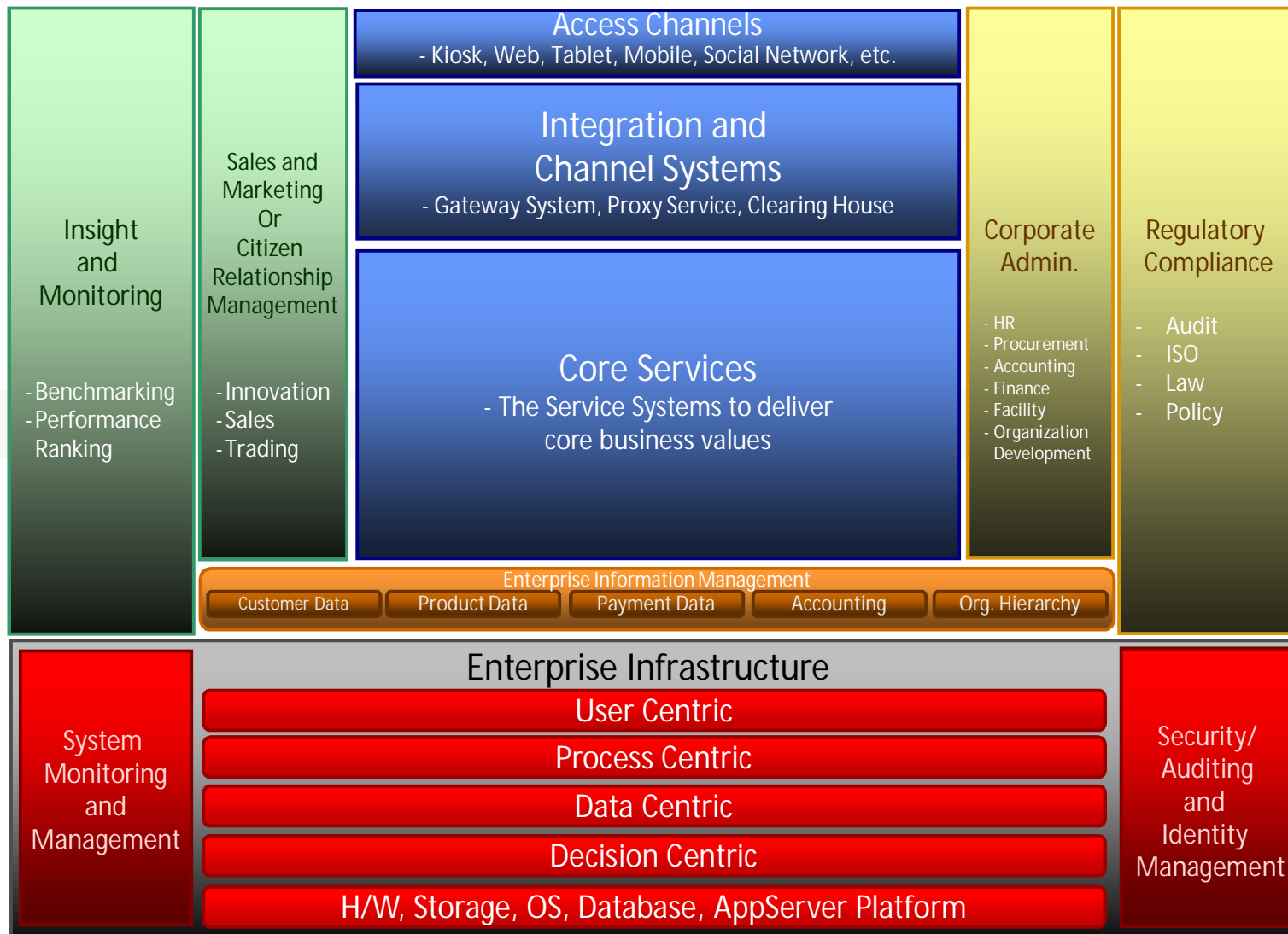
<i>Risk Category</i>	<i>Risk Description</i>	<i>Probability of Occurrence</i>	<i>Potential Business Impact</i>	<i>Recommended Risk Mitigation Actions</i>
<i>Operational</i>	Service Disruption	Low	High	Ensure proper planning for application migration – schedule off hours
	Slow Performance of new applications	Low	High	Ensure that target application goes through full load/performance testing prior to implementation
<i>Financial</i>	Loss of revenue due to new application complexity	Med	High	Ensure Proper training on new application to all end-users
	Increased SW maintenance costs	High	Low	Ensure that retired application support contracts are not renewed
<i>Compliance / Legal</i>	Security for new application	Low	Med	Ensure that security performs a full audit of new system prior to implementation
	PII data being migrated to new system	High	Low	Ensure that new system meets PII compliance requirements
<i>Strategic</i>	Loss of business functionally	Med	Med	Ensure that end to end process testing is completed prior to implementation

Key EA Deliverable Documents

Digital Transformation Reference Model



The Enterprise Reference Model



Business Service Analysis Worksheet

Service Name: _____

Service Owner: _____

Version: _____

Date/Time: _____

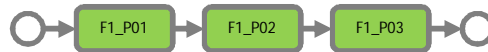
Key Objectives: 1. _____

2. _____

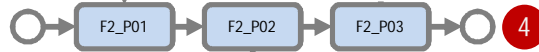
3. _____

4. _____

Business
Function1



Business
Function2



Business
Function3



Business Check Points, Information

1. _____, _____

2. _____, _____

3. _____, _____

4. _____, _____

5. _____, _____

Key Business Issues: _____

Key Technology Issues: _____

Enterprise Repository

Owner: Business Units

Business Objectives Worksheet

Version: ____ Date: ____

#	Business Goals	Business Services	Business Objectives	Owner	Business Processes	Remarks

Business Processes Worksheet

Version: ____ Date: ____

#	Business Process Name	Owner	Strategic Business Process (Y/N)	Main Service Description	High Level Business Process (Please attach up-to-date document)	Expected Transaction Complete Duration (hr,day,week)	Actual Transaction Complete Duration (hr,day,week)	Total of Transaction / (hr, day, month)	% of Transaction Duration done by automated system	Supported by Application(s)	Current Issues	Remarks

Enterprise Repository

Owner: Technology Unit

Applications/Touch Points Worksheet

Version: ____ Date: _____

#	Applications / Touch Points Name	Owner	Activity Flow (please attach up-to-date document)	Integration to which systems (online/batch)	Major Data Required	Current Issues	Remarks

Owner: Business Unit with supported by Technology Unit

Data Worksheet

Version: ____ Date: _____

#	Data Name	Owner	Description	Change Control of data (Y/N)	Structure/ Unstructure	Data Type (DB, JSON, XML, Sound, Image, VDO, etc.)	Current Issues	Ramarks

Enterprise Repository

Owner: Technology Units

Technology Worksheet

Version: ____ Date: _____

#	Applications / Touch Points / Database / Data Store Name	Total Connections	Concurrent Connections	Required Response Time (sec.)	Actual Response Time (sec.)	Development Software Languages / Framework (for App)	Package / In-House (for App)	Private / Public / Hybrid Cloud	OS / Platform (Windows, Linux, Docker, etc.)	Monitoring Tool Name	Sign On / Security System Name	% growth / year	Initial Cost (Baht)	M.A. Cost /year (Baht)	Remarks

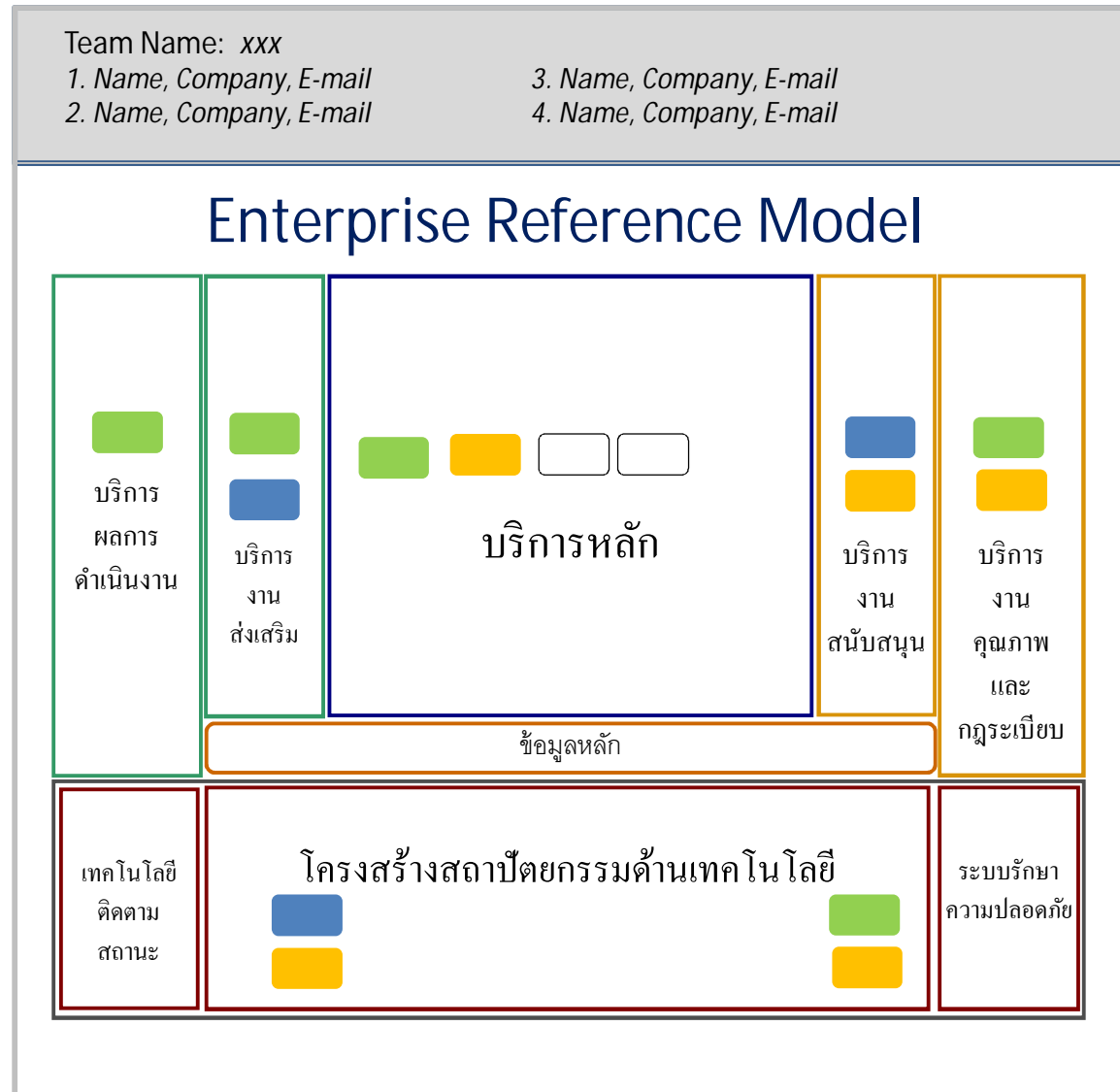
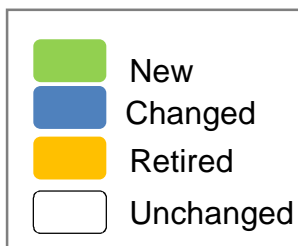
- #
- Applications / Touch Points / Database / Data Store Name
- Total Connections
- Concurrent Connections
- Required Response Time (sec.)
- Actual Response Time (sec.)
- Development Software Languages / Framework (for App)
- Package / In-House (for App)

- Private / Public / Hybrid Cloud
- OS / Platform (Windows, Linux, Docker, etc.)
- Monitoring Tool Name
- Sign On / Security System Name
- % growth / year
- Initial Cost(Baht)
- M.A. Cost /year (Baht)
- Remarks

Group Workshop - Enterprise Reference Model

The Future State

15 mins.
presentation



Enterprise Strategic Roadmap

		Current State	Transition 1	Transition 2	Future State
Business Architecture	Business Objectives	Maximize ROI of local business initiatives	Optimize IT efficiency and lower IT costs	Standardize cost, quality & consistency of business ops. Leverage knowledge across BUs	Increase speed to market and strategic agility
	Bus Op Model	Diversified	Coordinated	Replicated	Unified
	Business / IT Strategy	Maximize local business unit agility by maintaining full autonomy	Share IT infrastructure across business units for IT efficiency	Share core processes and/or data for business operational efficiency	Provide plug-and-play business process modules for strategic agility across enterprise
	EA Maturity	Business Silos	Standardized Technology	Optimized Core	Business Modularity
Application Architecture	Architecture Strategy	Customize & optimize local apps for BU needs	Provide shared infrastructure services via apps rationalization	Rationalize, standardize and optimize core business processes. Deploy enterprise apps.	Create/deploy/reuse plug-and-play business process components
Information Architecture	Architecture Strategy	Maintain data for BU needs	Rationalize data used by shared services	Standardize data assets and interchanges. Integrate and share info across BUs and COIs	Provide real time BI and implement predictive models
Technology Architecture	Architecture Strategy	Optimize platform for individual applications & data access via tuning configurations	Standardize tech; provide shared infrastructure platform	Optimize platform for shared core business apps/processes & data via virtualization	Fully leverage a service-oriented architecture

Digital Transformation Master Plan (DX Master Plan)

		Standardization & Optimization		Growth					
Initiatives	Projects	2016		2017		2018		2019	
		H1	H2	H1	H2	H1	H2	H1	H2
Executive Intelligence and external integration	Data Interoperability	→	→		→				→
	Information Service for Business Partner	→	→		→				→
Dev Stabilization	DevOps Standards	→	→						→
Business Process Optimization & Application Consolidation	Identify Processes and PMO	→				→			→
	Core Processes Optimization		→	→	→	→	→	→	→
	Applications Consolidation			→	→				→
	Open Data for PPP		→	→	→				→
	Business Intelligence		→	→	→	→	→	→	→
Digital Platform	Cloud, Big Data Platform	→	→						→
	Governance Framework		→	→	→				→
	IoT and Social Integration				→	→	→	→	→
	Network and Office Automation	→							→

Governance Guideline

Many mechanisms make governance work

<i>Governance Mechanisms</i>	<i>Objective</i>
<i>Executive committee</i>	Take a holistic view
<i>IT council of business, IT executives</i>	Focus on driving value
<i>IT leadership committee</i>	Coordinate across the enterprise
<i>Architecture committee</i>	Identify strategic technologies
<i>Business / IT relationship managers</i>	Ensure feedback, good iteration
<i>Process teams with IT members</i>	Take a process view
<i>Service-level agreements</i>	Specify, measure IT services
<i>Chargeback arrangements</i>	Shape behavior, recoup costs

Adapted from Weill and Woodham, 2002; M. Broadbent & P. Weill , *Leading Governance, Business and IT Processes*, ITEP Findings, 1998

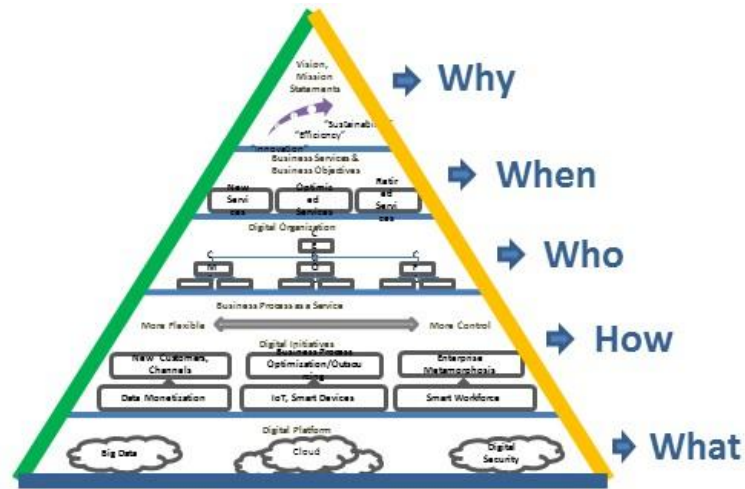
Key Elements of a Business Case

"Show me how this dream will become reality and give me the confidence to invest."

- **Business Challenge:** A clear and well defined business problem provides the foundation of a business case
- **Current State Constraints:** Defines what is lacking in their current environment and the impact of a "business as usual" approach
- **Future State Capabilities:** Defines the Oracle solution to create a vision for the future state; defines the value of leveraging Oracle technology
- **Impacts:** Identifies and quantify the tangible and intangible benefits associated with the future state, ideally linked to unique Oracle enablers
- **Time:** Implementation approach and benefits over time; it is important that the customer understand how they will realize the projected benefits

1. Executive Summary
 - Key Business and IT Issues
2. Current Business State
3. Proposed Course of Action
4. Options Evaluation
 - Tactical
 - Strategic
 - Status-quo ("do nothing")
5. Financial Analysis
6. Management Practices
 - Project Management
 - Risk Mitigation
 - Governance
7. Appendices

Part 3



Business Intelligence and Business Analytics

- Understand Enterprise Analytics Needed
- Traditional Business Intelligence
- Big Data for Business Analytics
- Group Activities

อ.दनัยรัล ธนบดีธรรมจารี

Line ID: Danairat

FB: Danairat Thanabodithammachari

+668-1559-1446

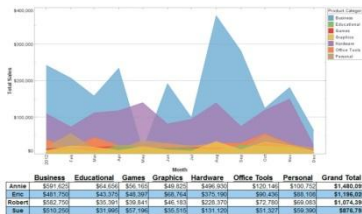
Agenda

- What is Business Intelligence (BI)?
- What is Business Analytics (BA)?
- Business Analytics and Business Intelligence
- Choosing between BI and BA
- Choose the Right Presentation Chart Types
- Understand Enterprise Analytics Needed
 1. (Re)Identifying your vision and missions
 2. Identifying Business Services and Objectives
 3. Identifying BI for Management Level
 - Top Business Questions from CMO
 - Top Business Questions from COO
 - Top Business Questions from CFO

Agenda

- 4. Identifying Operational BI
- 5. Identifying BI and BA Platform
 - Traditional DW and BI Platform
 - Big Data for Business Analytics Platform
 - § Big Data People and Team Structure
 - § Big Data Project Life Cycle
- Business Analytics vs. Business Intelligence Activities
- Worksheet
- Summary

What is Business Intelligence (BI)?

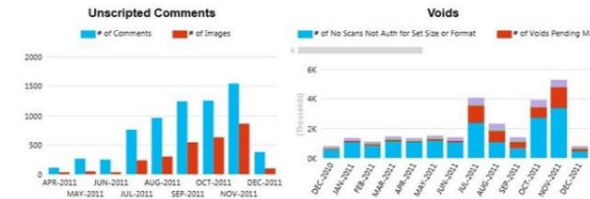


Key Measures / Ratios as of November 19, 2004 (● Best ● Fair ● Poor)

Plant Name	Sales	Cost	Quantity	Profit
Boston	●	●	●	●
Dallas	●	●	●	●
Los Angeles	●	●	●	●
Orlando	●	●	●	●
Saint Louis	●	●	●	●
Seattle	●	●	●	●



Performance Dashboard

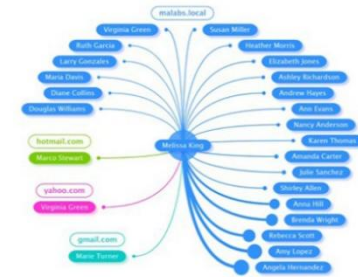
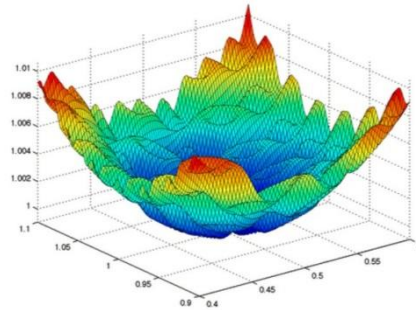
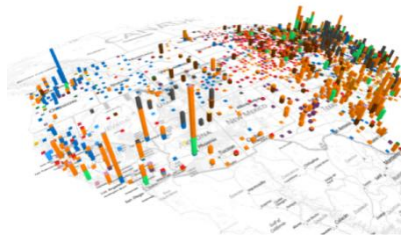
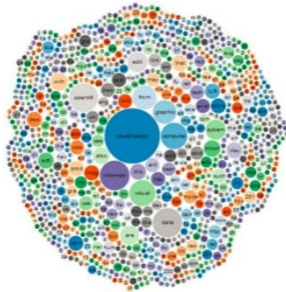


Business intelligence systems are used to maintain, optimize and streamline current operations. BI improves and maintains operational efficiency and helps businesses increase organizational productivity. Business intelligence software confers many benefits, notably powerful reporting and data analysis capabilities. Using BI's rich visualization mechanisms, managers are able to generate intuitive, readable reports that contain relevant, actionable data.

Popular business intelligence solutions include; SAP BusinessObjects, QlikView, IBM Cognos, Microstrategy, etc.

<https://selecthub.com/business-intelligence/business-intelligence-vs-business-analytics/>

What is Business Analytics (BA)?

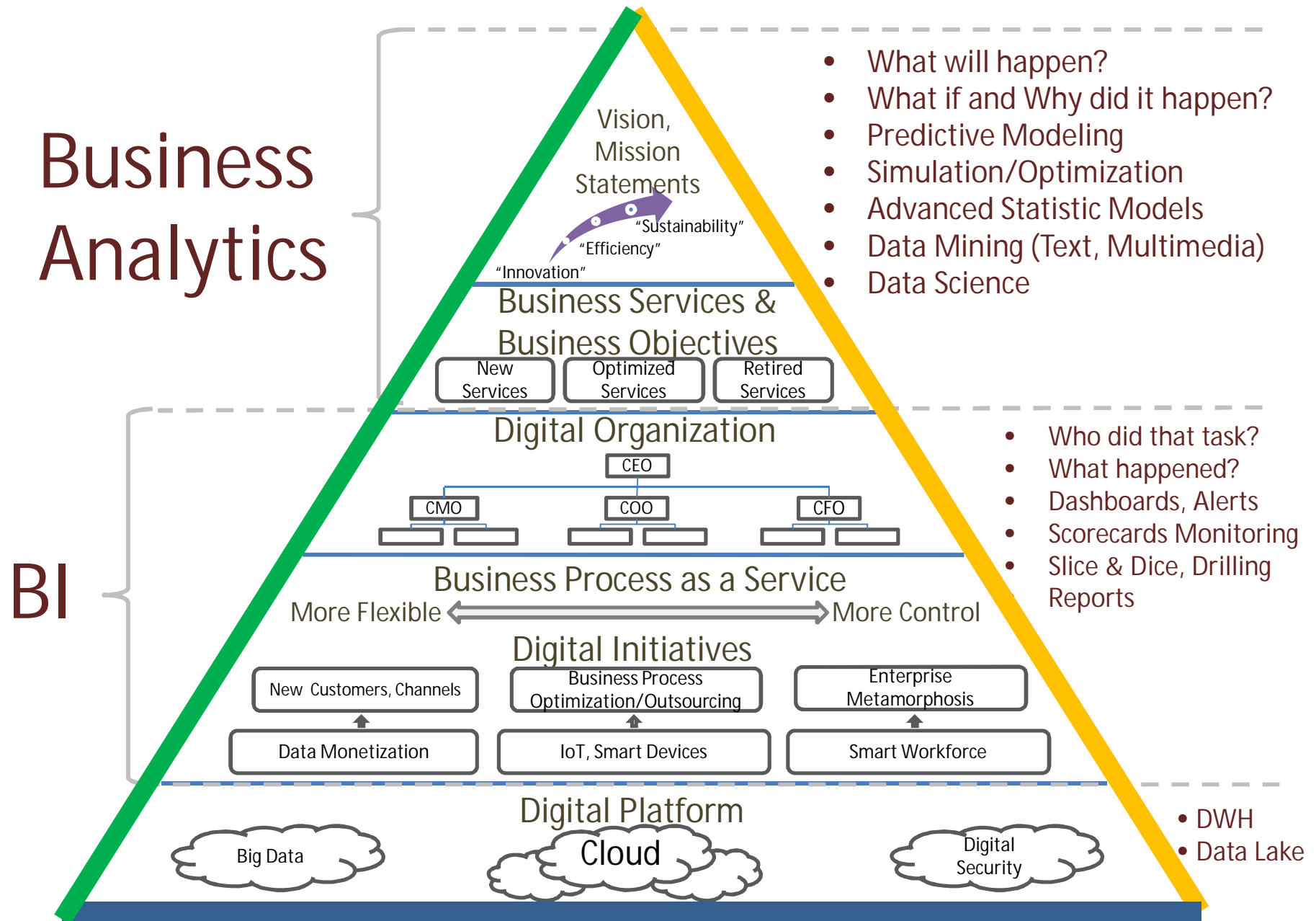


Like business intelligence, BA collects and analyzes data, employs **predictive analytics** and generates **richly visualized reports**, helping identify and address an organization's weak points. That's where similarities end. Business analytics software is used to explore and analyze historical and current data. It utilizes **statistical analysis**, **data mining** and quantitative analysis to identify past business trends.

Popular business analytics solutions include; SAP Business Analytics Suite, Pentaho BA, Birst BI and Tableau Blg Data Analytics.

<https://selecthub.com/business-intelligence/business-intelligence-vs-business-analytics/>

Business Analytics and Business Intelligence



Choosing between Business Intelligence (BI) and Business Analytics (BA)

While superficially similar, the difference between business intelligence vs business analytics is clear:

- BI uses past and [current data to optimize the present for current success](#).
- BA uses the past and analyzes the present to [prepare businesses for the future](#).

Choosing the solution for your business depends on your aims.

- If you are satisfied with your business model as a whole and mainly wish to improve operations, [increase efficiency and meet organizational goals, business intelligence may be an optimal solution](#).
- If you intend to [change your business model and need to know where to start, business analytics might be the best option](#).

<https://selecthub.com/business-intelligence/business-intelligence-vs-business-analytics/>

Choosing between Business Intelligence (BI) and Business Analytics (BA)

Business Intelligence (BI)

BI has the added advantages of targeting a business's weak areas and providing actionable solutions to those problems. Business Intelligence software is an excellent solution for managers who want to improve decision making and understand their organization's productivity, work processes and employees. And, with that understanding, improve their business from the ground up.

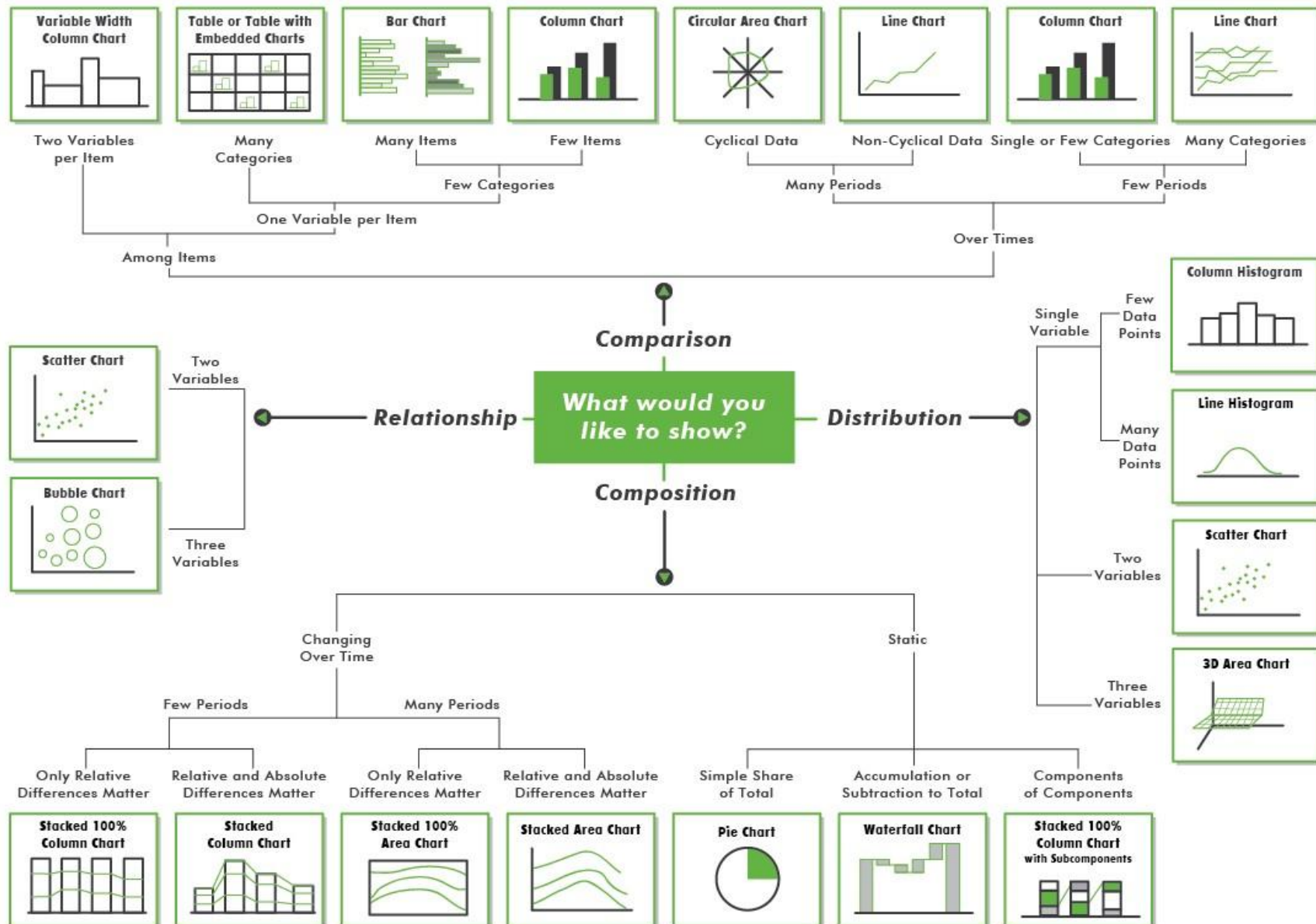
Business Analytics (BA)

If your organization is a new entity, or in the midst of significant changes, business analytics software is a serious contender. BA uses historical data, current information, and projected trends to ensure your business makes the right changes. Business analytics is the solution if you want to analyze your company, your market, and your industry with the dual goals of optimizing current performance and predicting business trends to help you remain competitive in the future.

Most businesses want a combination of current success and future preparation. Alone or together, business analytics and business intelligence can help you take your business where you want it to go.

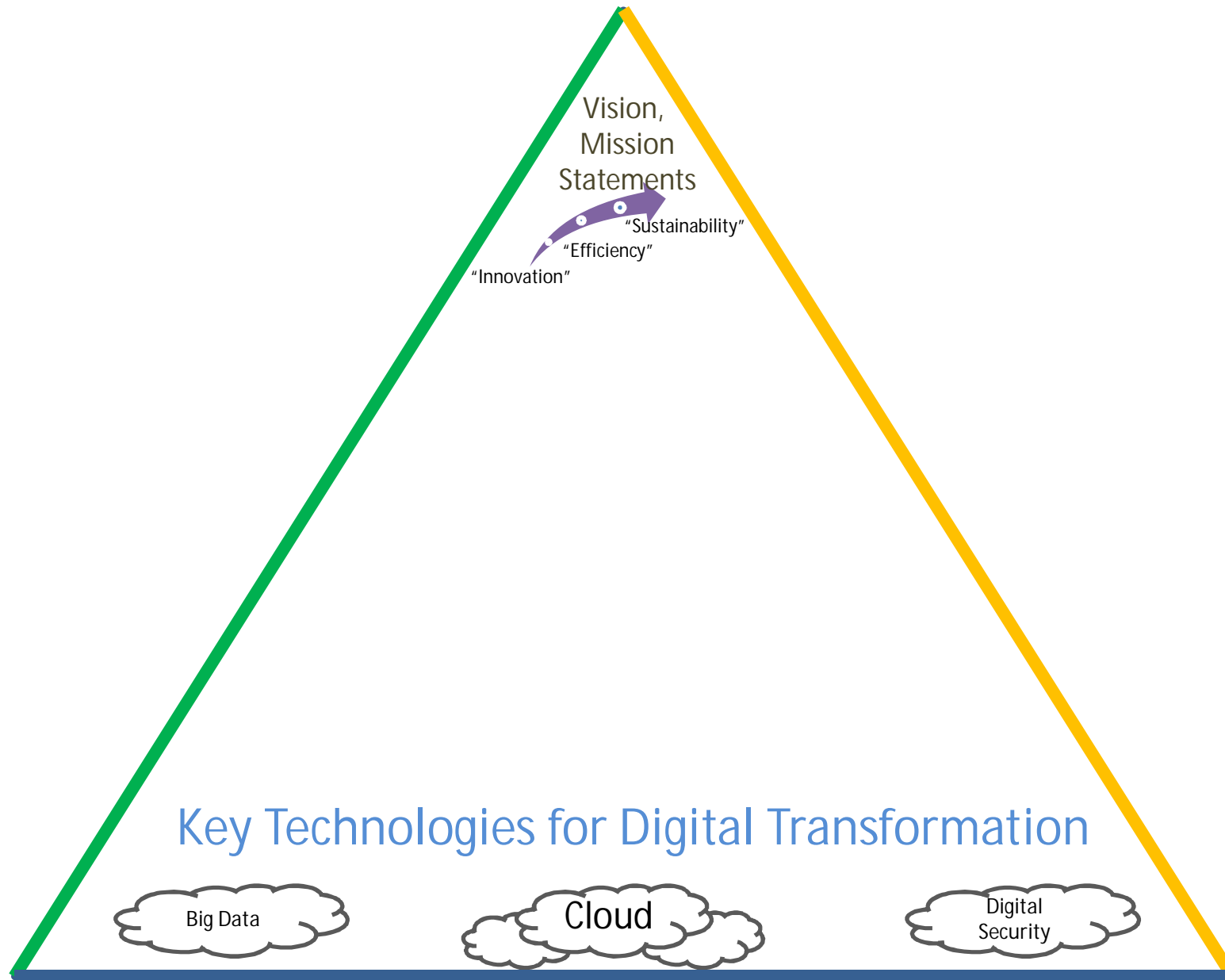
<https://selecthub.com/business-intelligence/business-intelligence-vs-business-analytics/>

Choose the Right Presentation Chart Types

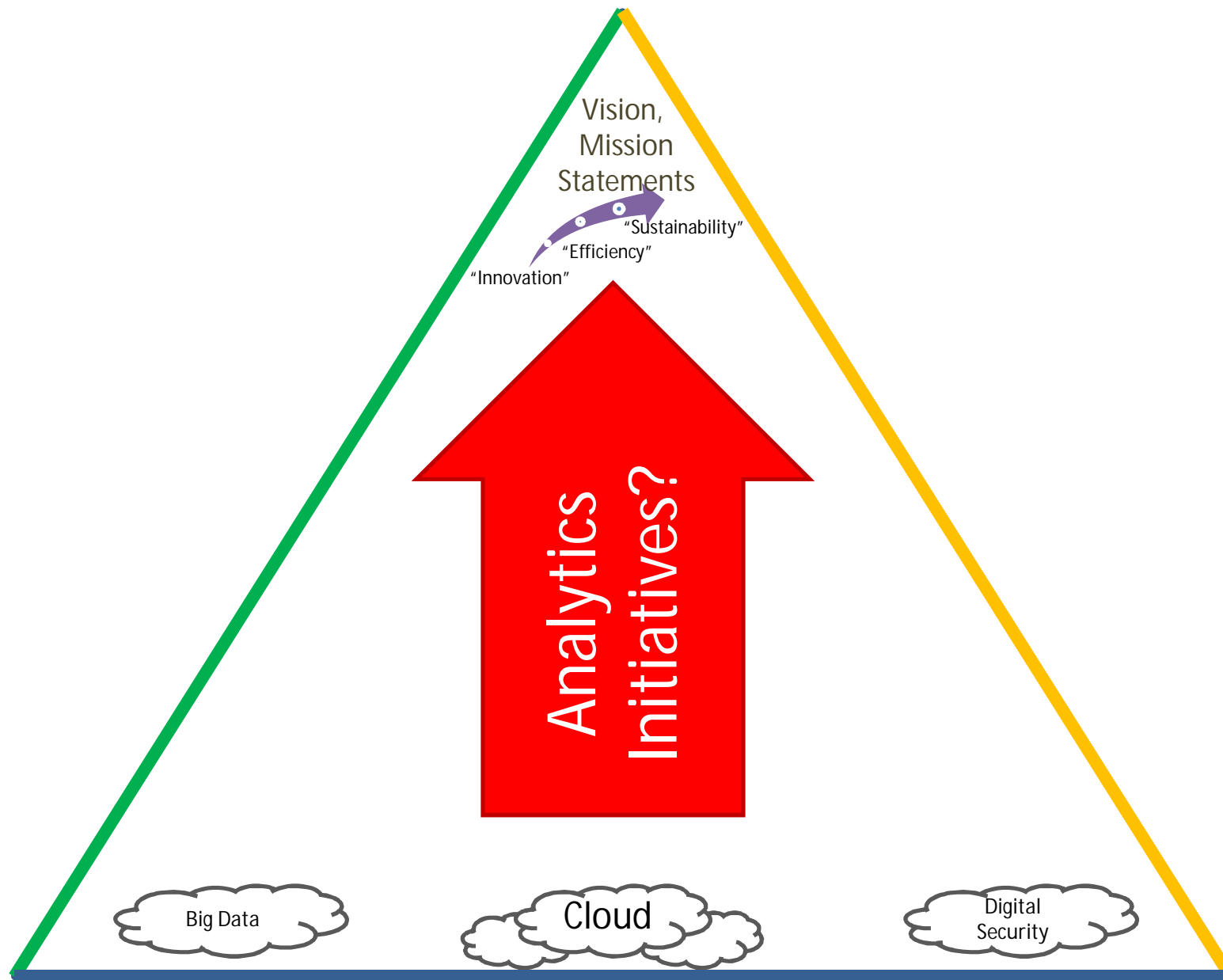


Understand Enterprise Analytics Needed Using Digital Transformation Reference Model

Digital Transformation Reference Model



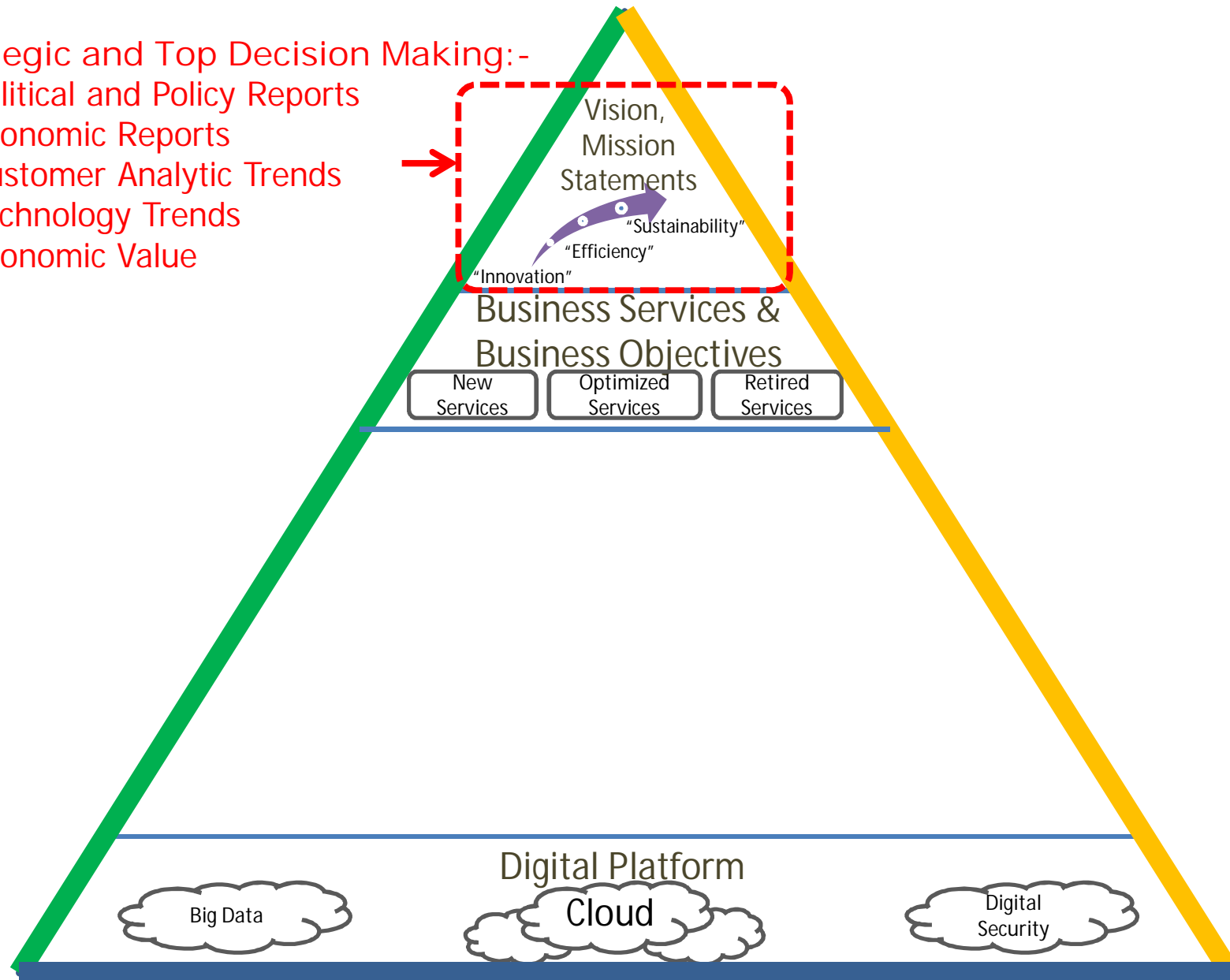
Digital Transformation Reference Model



1. (Re)Identifying your vision and missions

Strategic and Top Decision Making:-

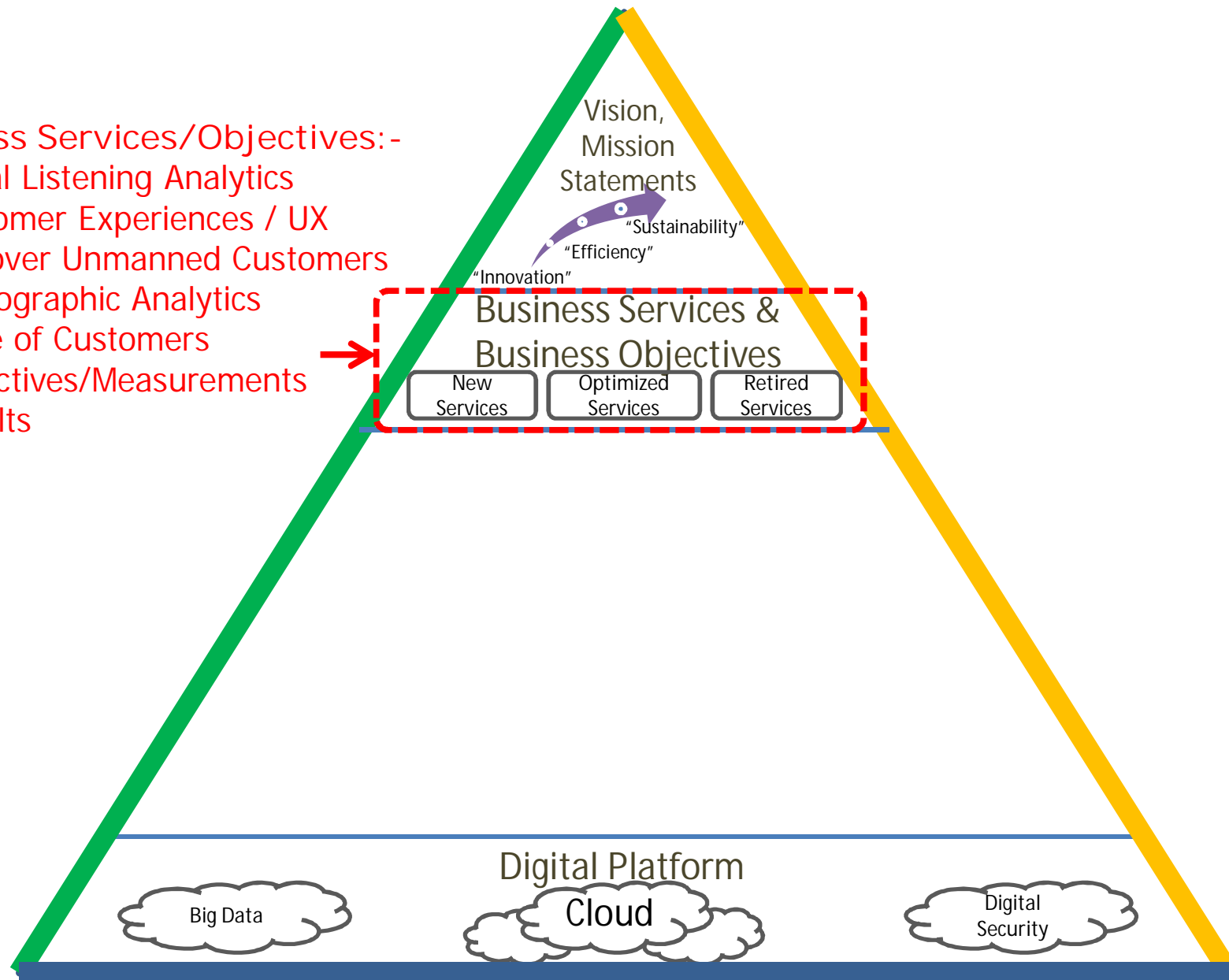
- Political and Policy Reports
- Economic Reports
- Customer Analytic Trends
- Technology Trends
- Economic Value



2. Identifying Business Services and Objectives

Business Services/Objectives:-

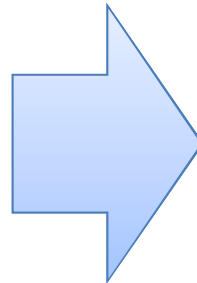
- Social Listening Analytics
- Customer Experiences / UX
- Discover Unmanned Customers
- Demographic Analytics
- Voice of Customers
- Objectives/Measurements Results



Driving Data to Business Values

Data Inputs:-

- Business Activities
- Conversations
- Web Logs
- Social Media
- Words
- Picture
- Voice
- Videos
- Sensors
- Etc.



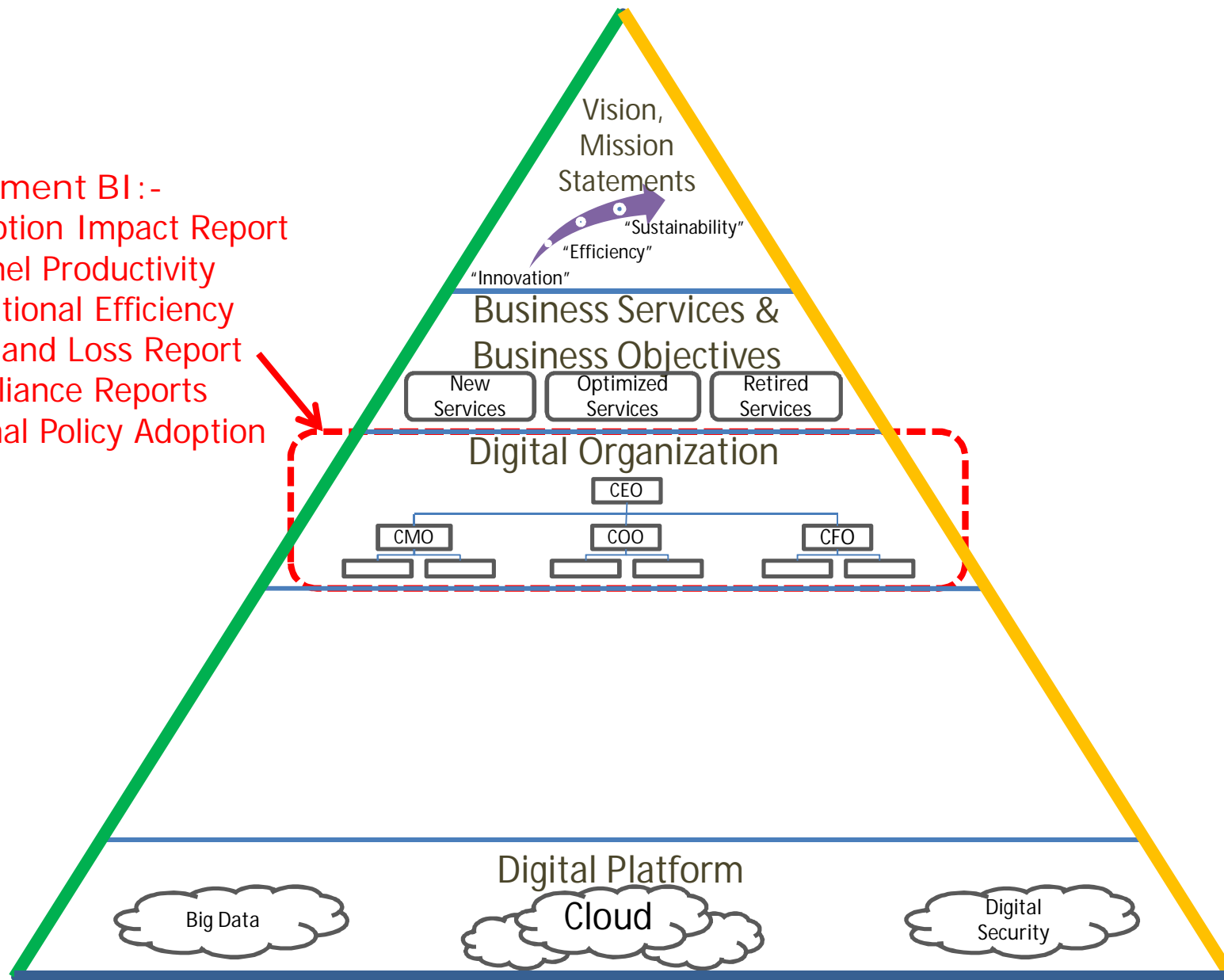
Business Values:-

- Pricing analytics
- Text Analytics
- Sentiment Analysis
- Relationship Analysis
- Contextual Analysis
- Face Analysis
- Voice Recognition
- Behavioral Analysis
- Fraud analytics
- Etc.

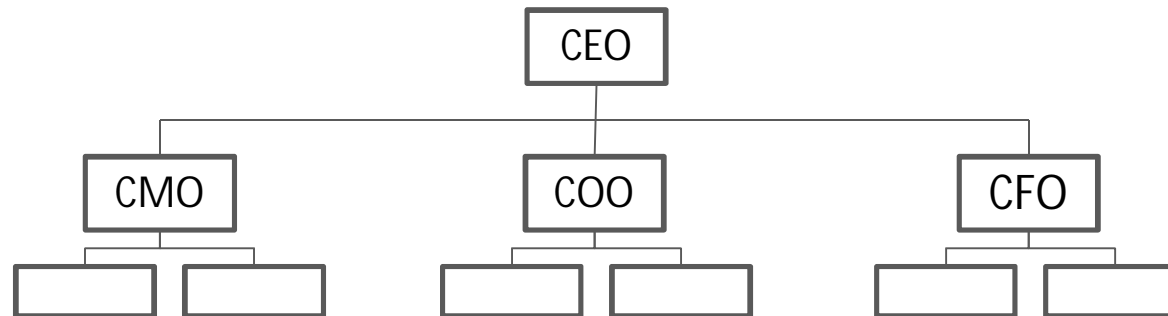
3. Identifying BI for Management Level

Management BI:-

- Promotion Impact Report
- Channel Productivity
- Operational Efficiency
- Profit and Loss Report
- Compliance Reports
- Internal Policy Adoption

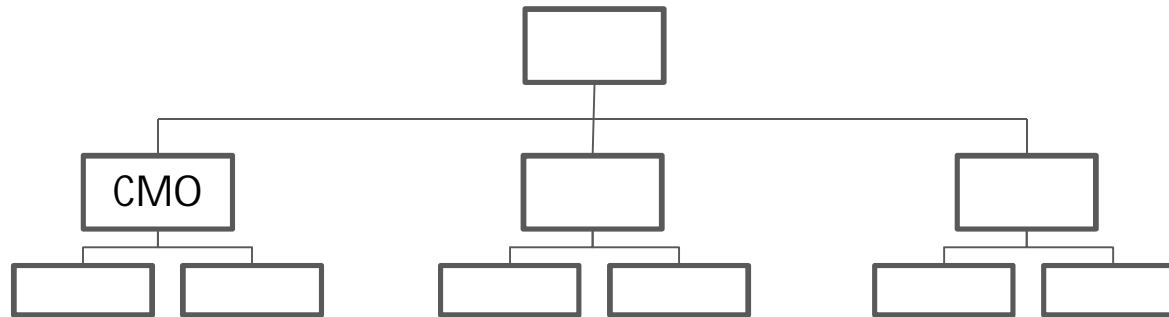


Digital Organization



- CEO : combine all successes from all C-Level
- CMO: innovation for new products offering
- COO : operation and automation
- CFO : finance, budgeting, HR, Audit, QA and IT
- Put the right skill on the right role
- Promote paperless policy organization

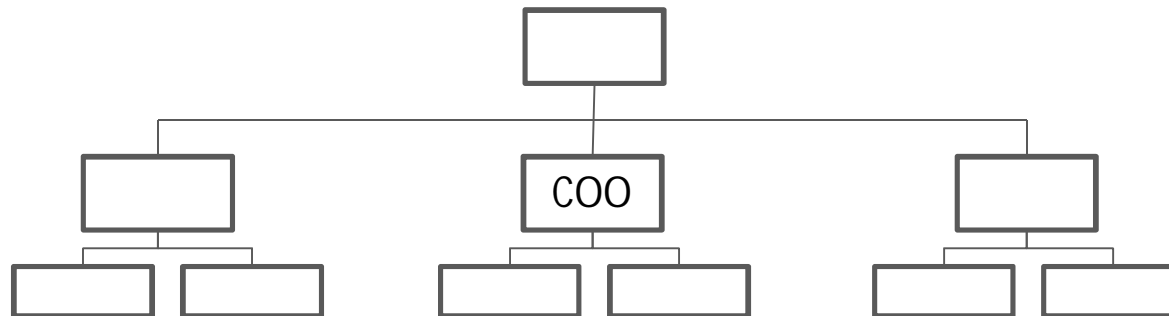
Top Business Questions from CMO



Chief Marketing Officer (CMO), Innovation, Sales and Promotion:-

- Which customers should we target?
- What has caused the change in my pipeline?
- Which are my most profitable campaigns/region?
- Did store sales spike when we advertised in the local paper or launched the campaign?
- What is the most profitable sales channel and how has that changed over time?

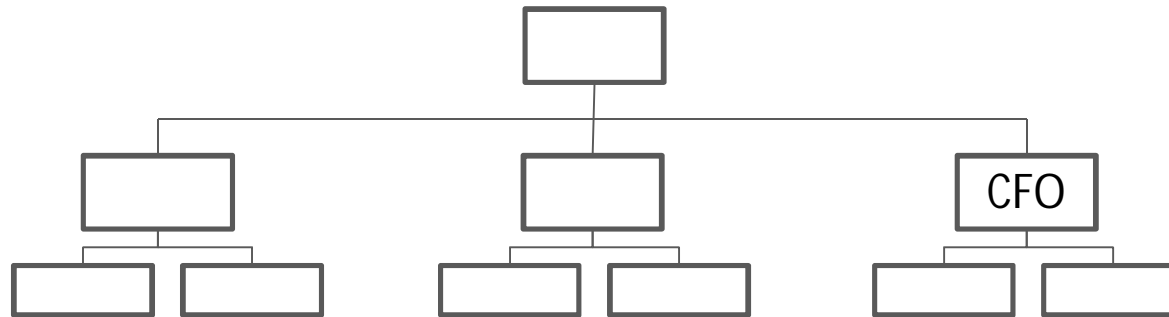
Top Business Questions from COO



Chief Operation Officer (COO):-

- Lead time and cost of production for each products
- Which order processing processes are most inefficient?
- Which vendors are best at delivering on time and on budget?–
- How many additional personnel do we need to add per branch?
- Percent of error or defect trend for each product

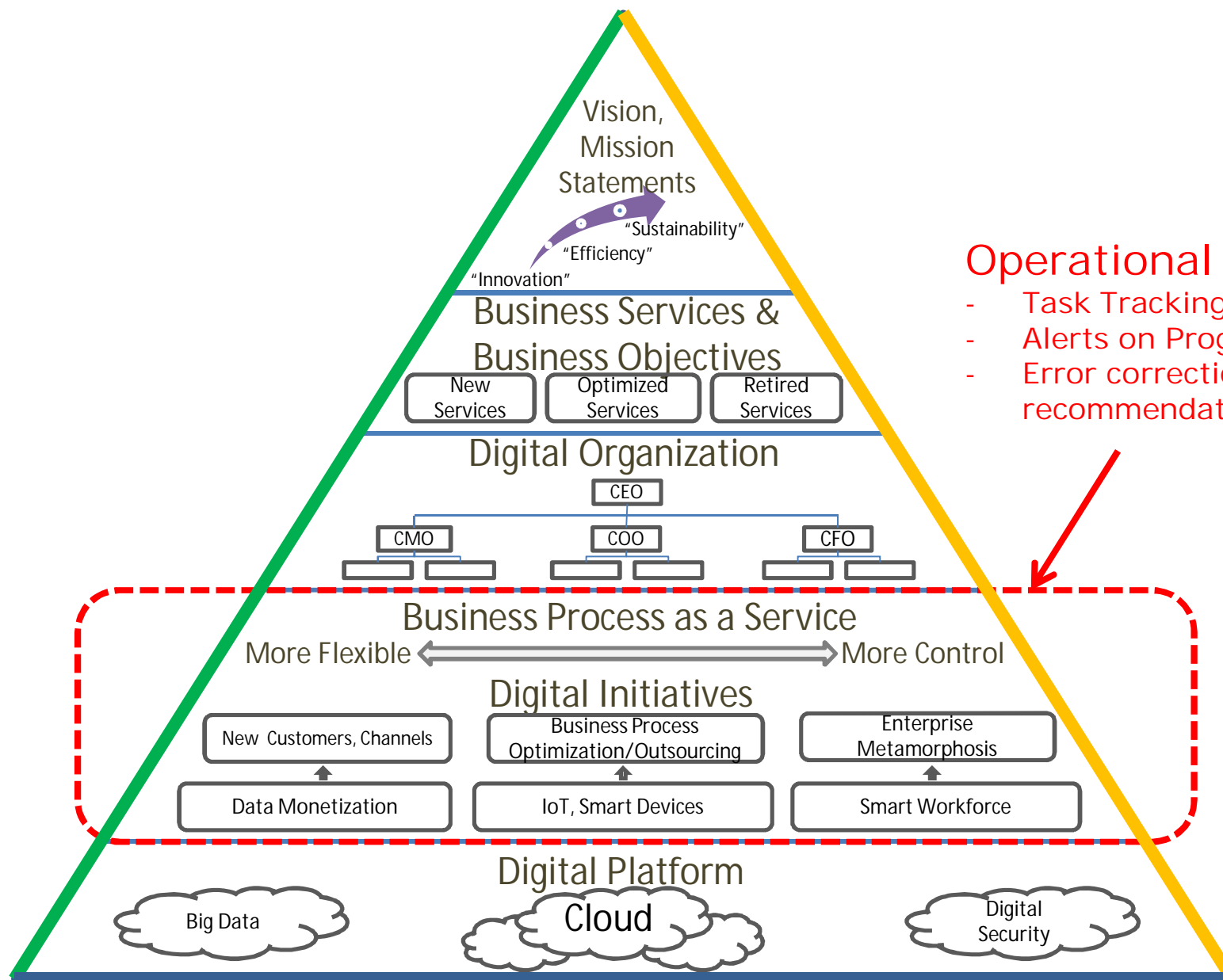
Top Business Questions from CFO



Chief Financial Officer (CFO):-

- What is the fully loaded cost of new products deployment?
- What are the current trends in cash flow, accounts payable and accounts receivable and how do they compare with plan?
- What is the expected annual profit/loss based on current marketing and sales forecasts?
- How are forecasts trending against the annual plan?

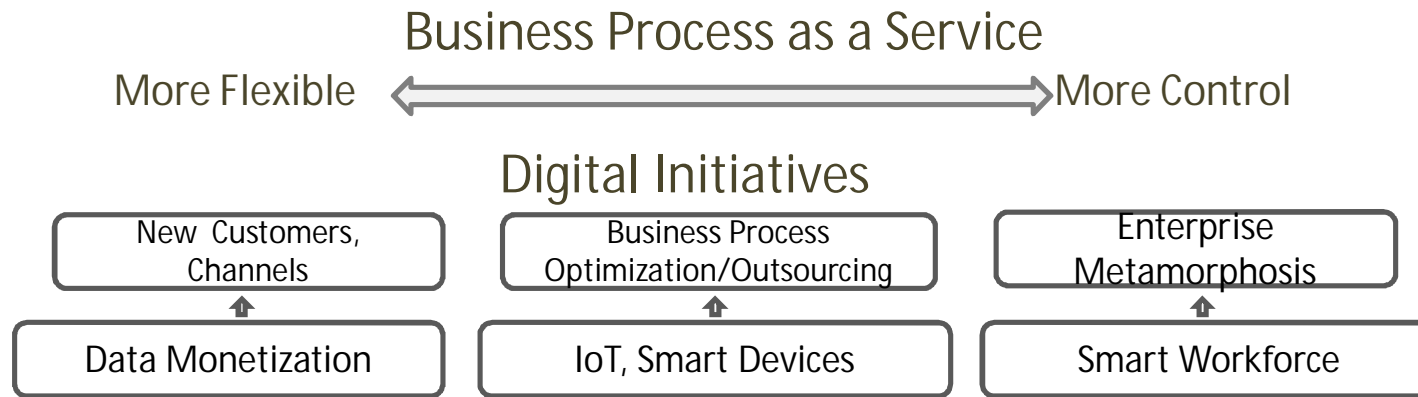
4. Identifying Operational BI



Operational BI :-

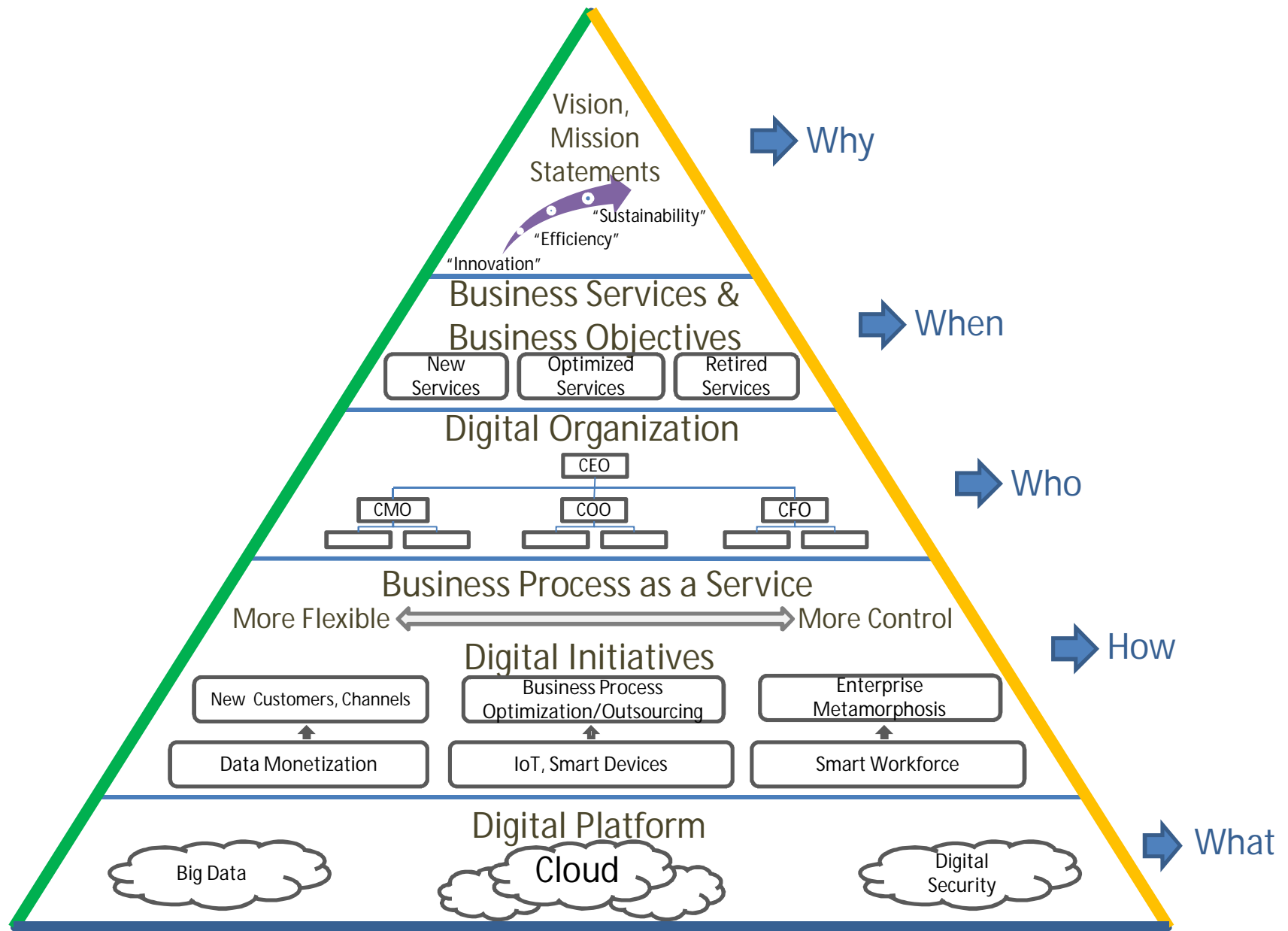
- Task Tracking Status
- Alerts on Progression
- Error correction and recommendation

BI and Alerts for Operational Level

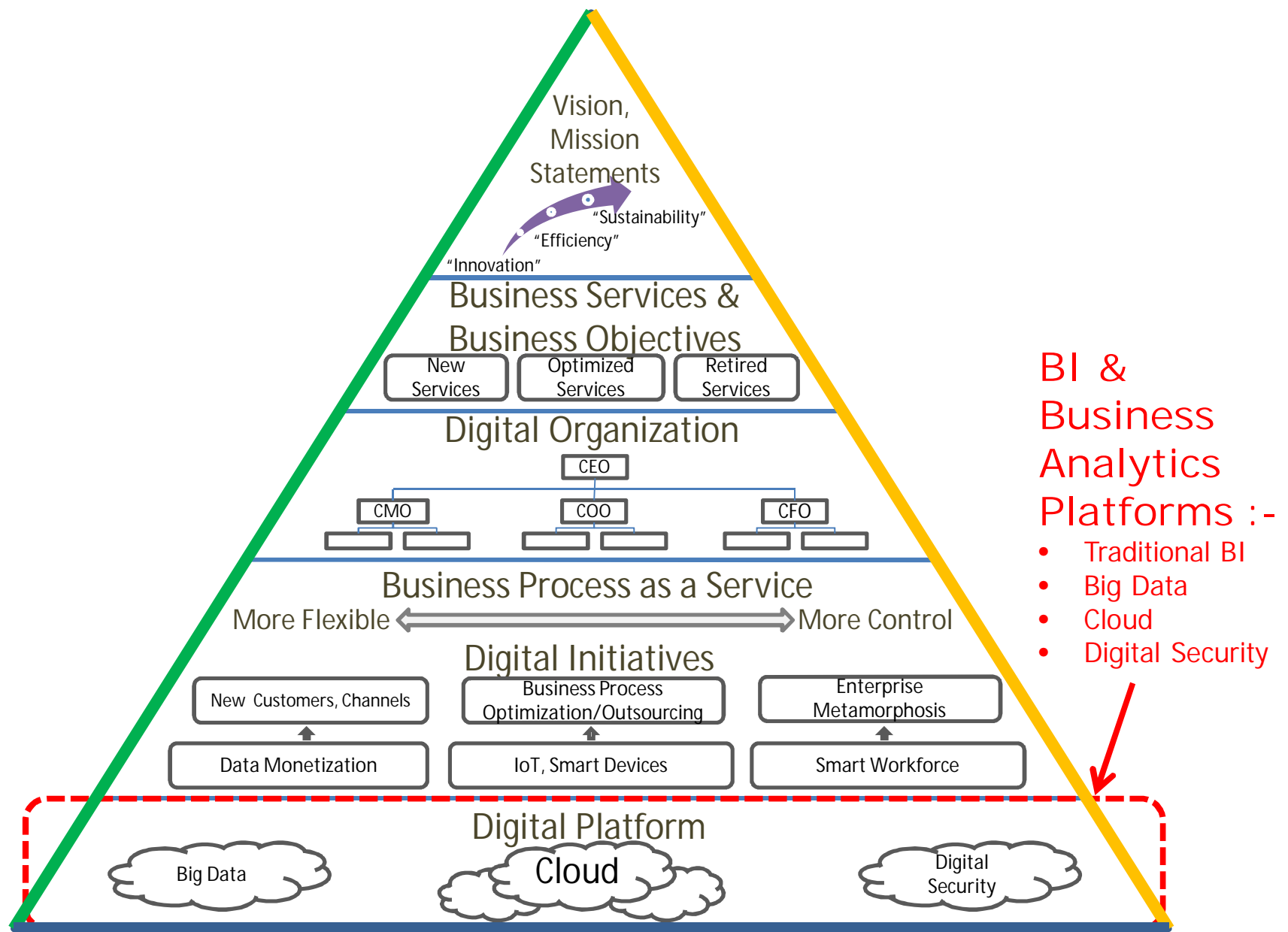


- BI and alerts for customers need to be more flexible
- BI and alerts for production operation team need to be more automation
- BI and alerts for back office (HR, payroll, finance) need to be more auditable

Key Questions Type in each level of enterprise

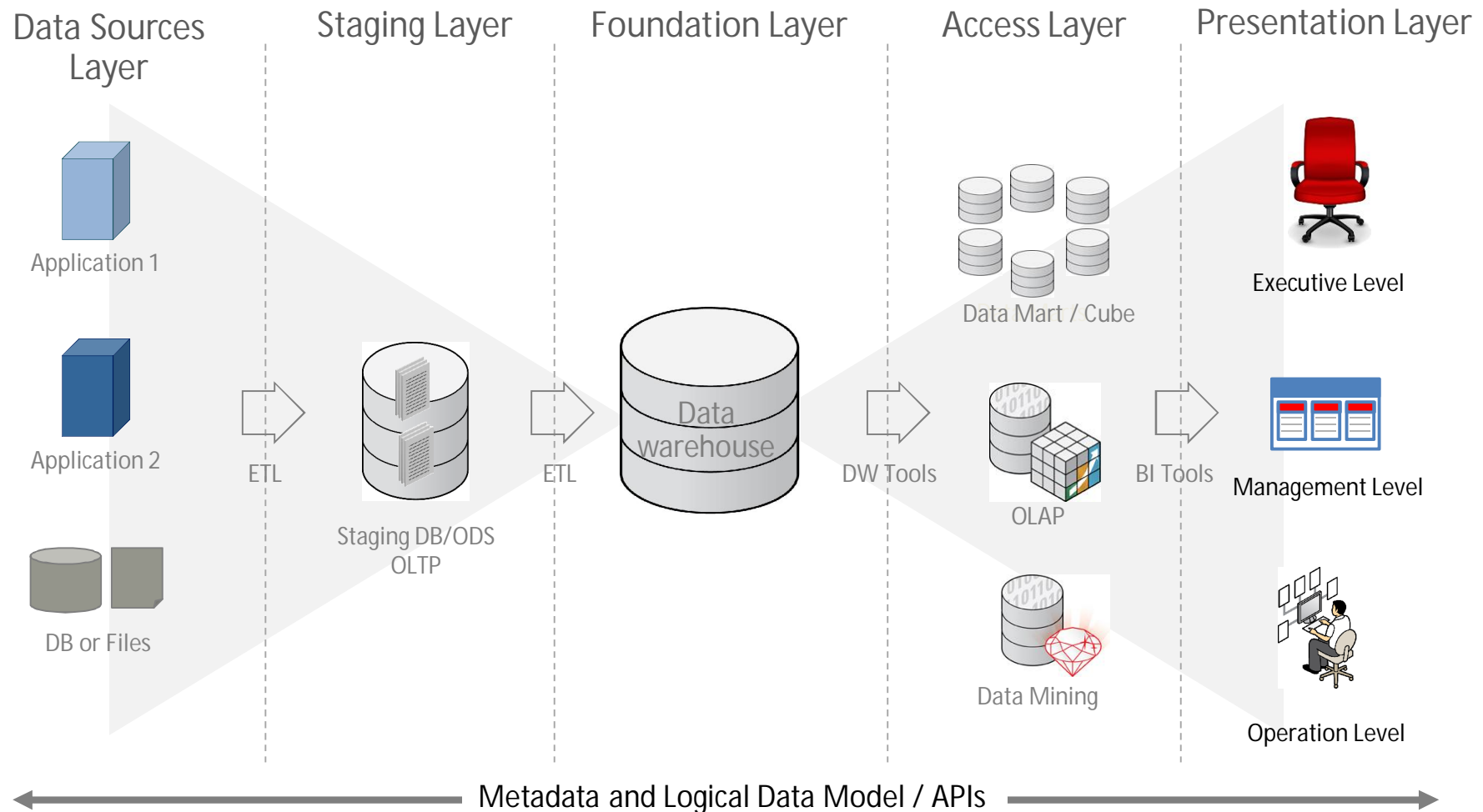


5. Identifying BI and BA Platform

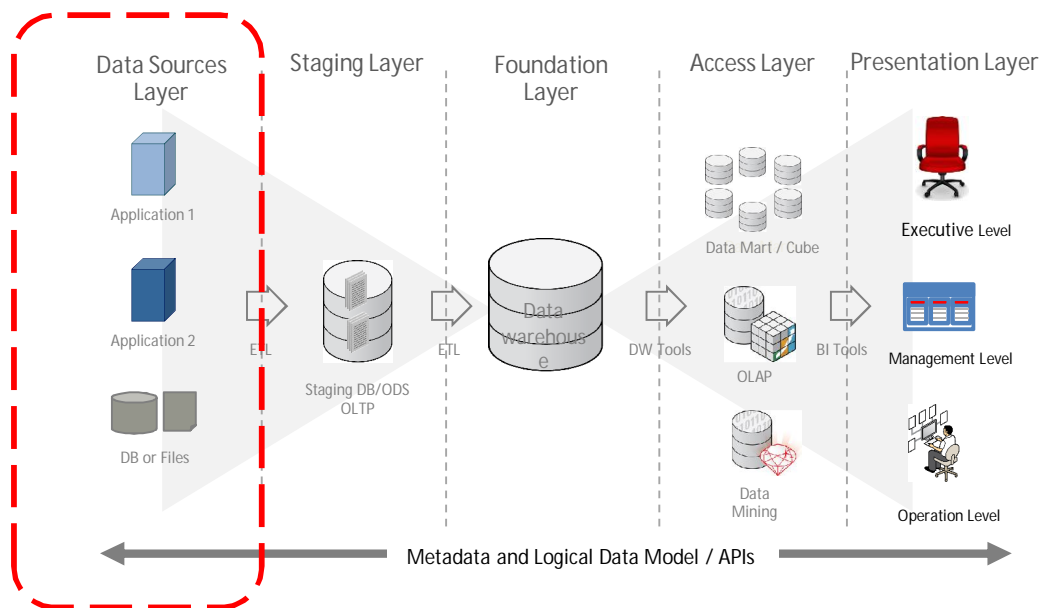


5.1 Traditional Data Warehouse and Business Intelligence Platform

Traditional Data Warehousing and Business Intelligence



Traditional Data Warehousing and Business Intelligence



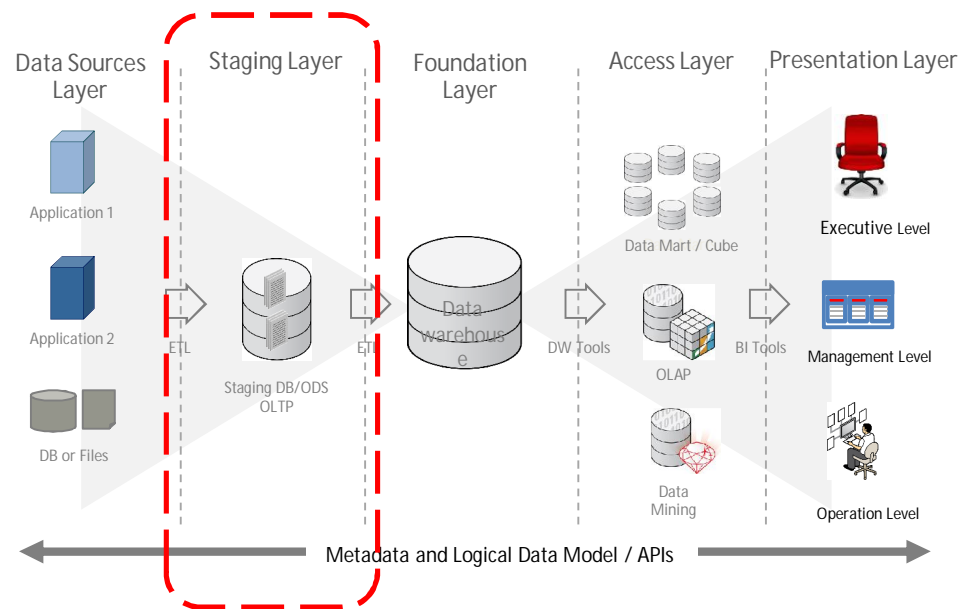
1. Data Source Layer: defining which data will be loaded into the system and analyzed.

- Text Files
- OLTP, Databases
- XML
- JSON
- Spreadsheet Files

Source Data Examples:-

- Retail POS system
- Web Site
- DBMS

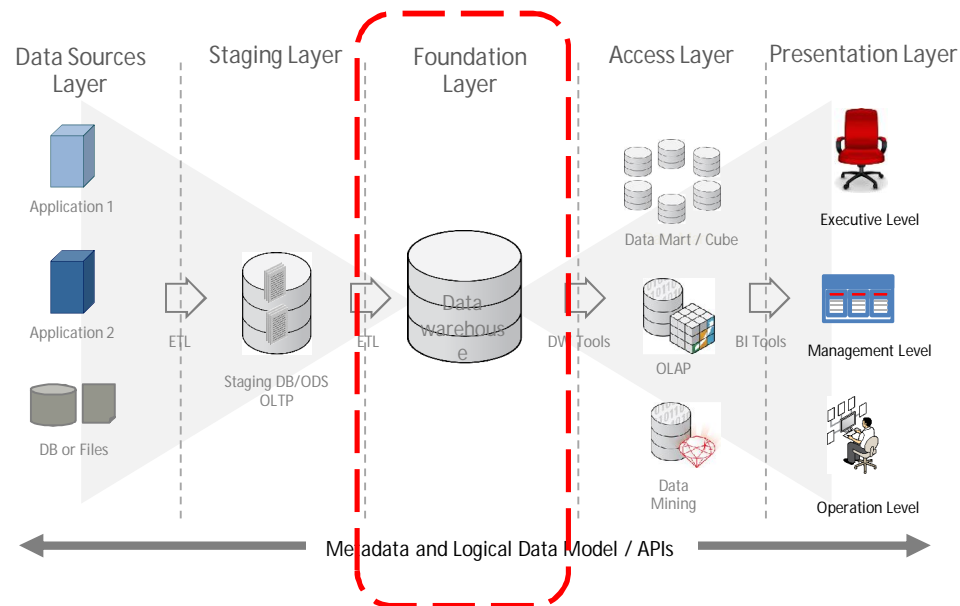
Traditional Data Warehousing and Business Intelligence



2. ETL (Extract, Transform, and Load) and Staging Layer:

- Tools to move data to staging DB
- Staging DB is a temporary storage to be loaded to DWH
- Staging DB could be operational reporting tool/platform

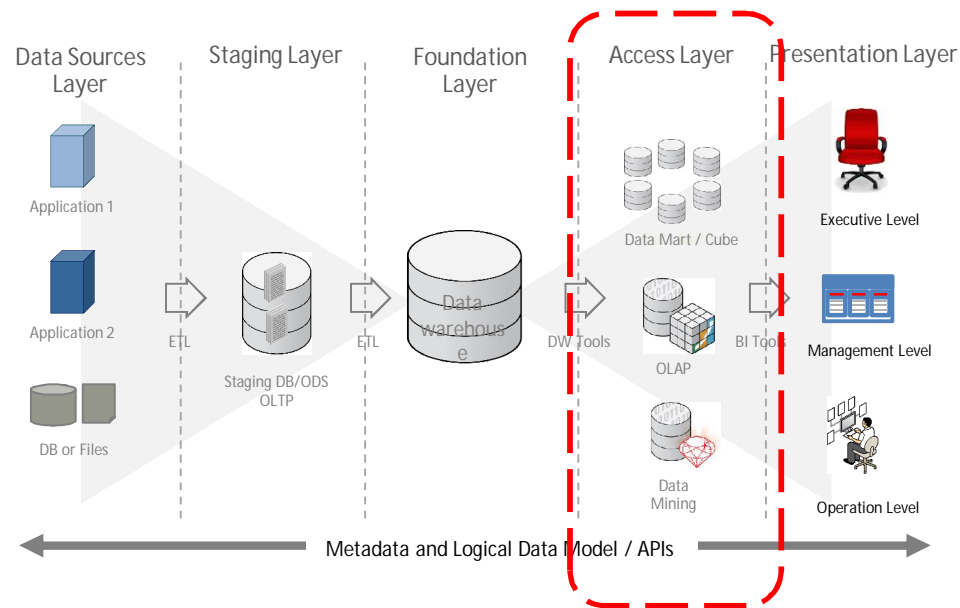
Traditional Data Warehousing and Business Intelligence



3. Data Warehouse:-

- Used for reporting
- A scalable DB storing historical enterprise data
- Online Analytical Processing
- Not used for transaction processing

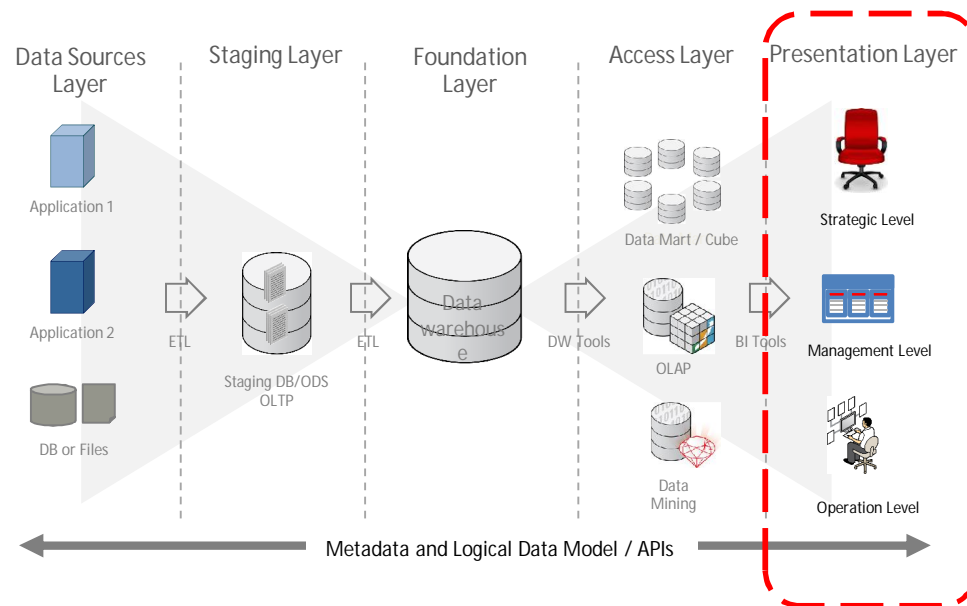
Traditional Data Warehousing and Business Intelligence



4. Access Layer:-

- Data Mart for business fast query (Star Schema)
- OLAP uses a multidimensional data model, allowing for complex analytical and ad-hoc queries with a rapid execution time
- Data mining for mostly in structured data format

Traditional Data Warehousing and Business Intelligence

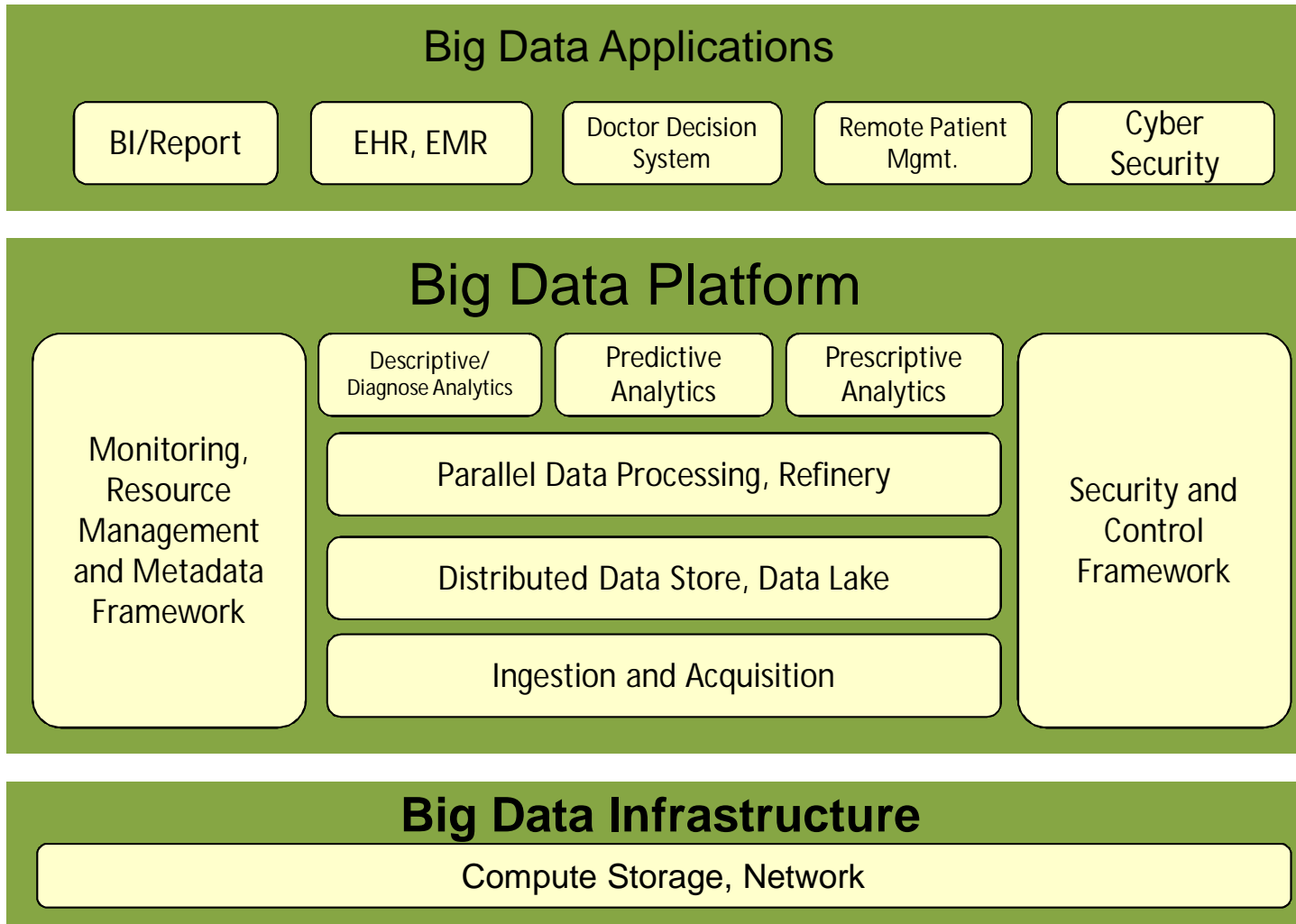


5. Presentation Layer:-

- Need to gather requirements from Business Units for Visualization and Touch points
- Need to identify data sources and method to deliver results
- Enterprise dashboards, reports and alerts that present findings from the analysis

5.2 Big Data for Business Analytics Platform

Big Data Architecture for Healthcare



Big Data System Architecture



Staffs



Partners



Customers



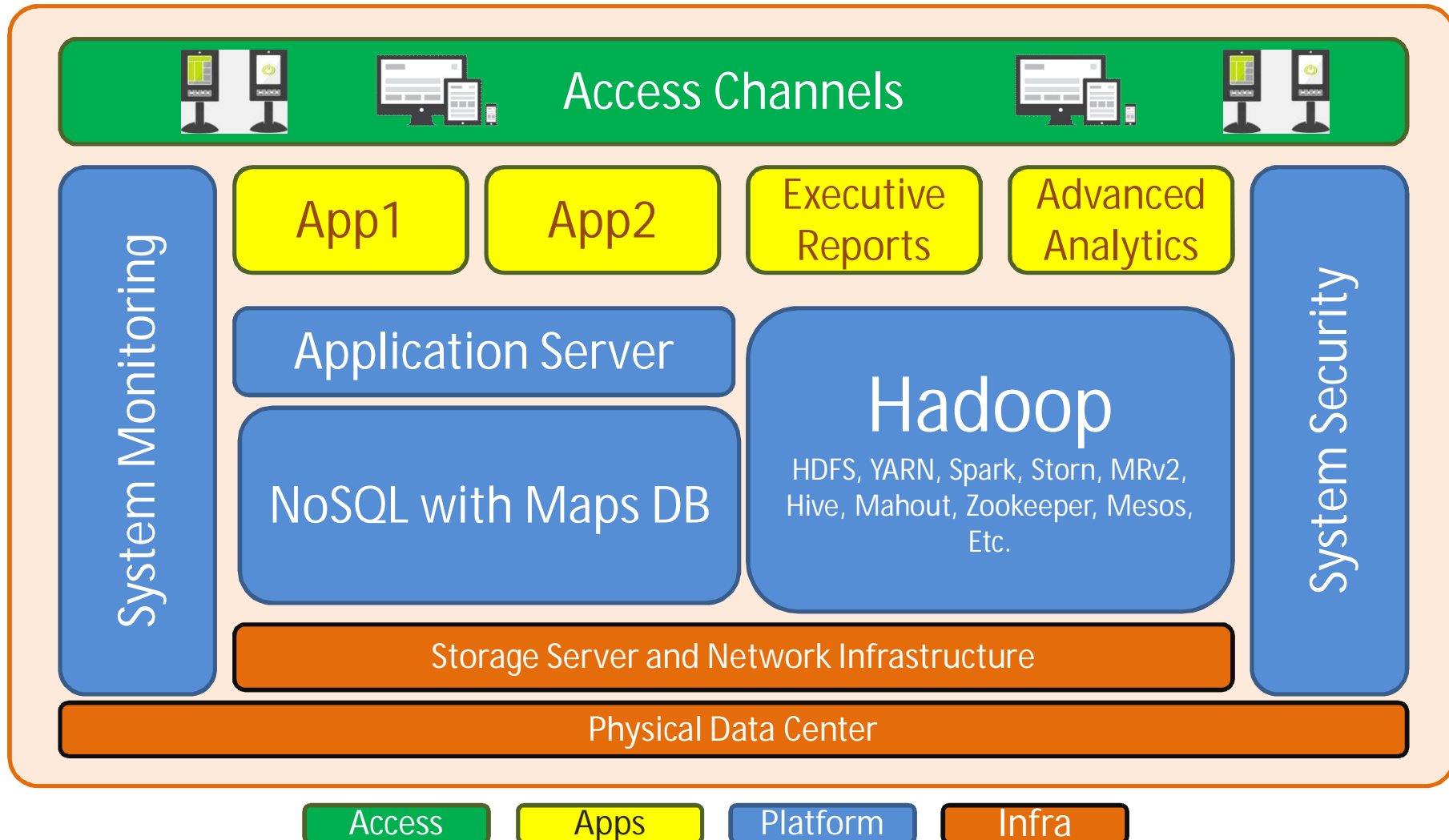
Managers



Executives

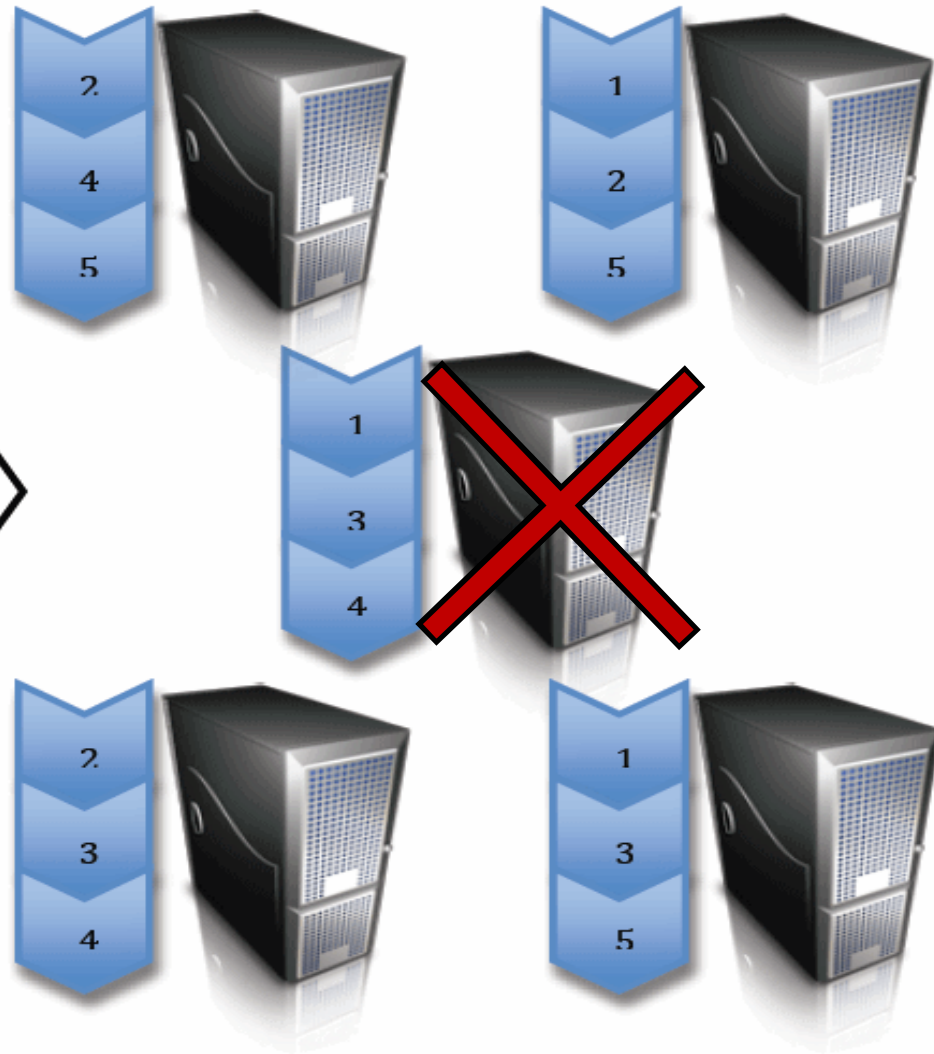


Experts



HDFS: Hadoop Distributed File System

Block Size =
64MB/128MB/256MB
Replication Factor = 3

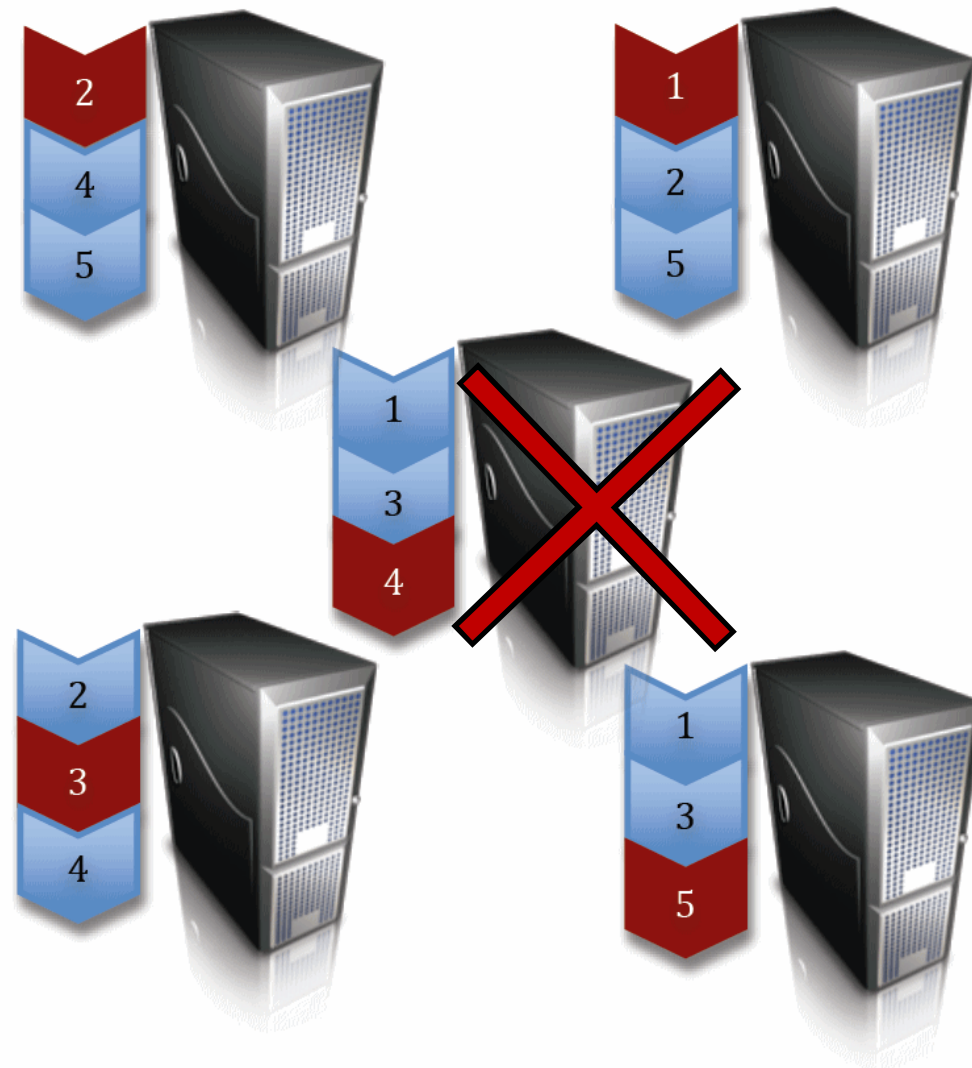


Cost/GB is a few
¢/month vs \$/month

apache.org/hadoop/

MapReduce: Distributed Processing

Hadoop takes advantage of HDFS' data distribution strategy to push work out to many nodes in a cluster. This allows analyses to run in parallel and eliminates the bottlenecks imposed by monolithic storage systems.



apache.org/hadoop/

Key Activities, People and Deliverables

Analytic Types

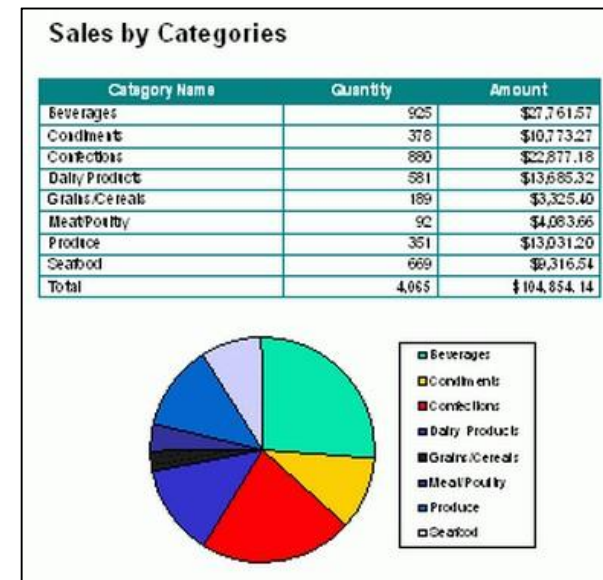
Descriptive/Diagnostic analytics answers the question, "**What happened in the business?**" It looks at data and information to describe the current business situation in a way that trends, patterns and exceptions become apparent. This takes the form of reports, dashboards, MIS, etc.

ASSEMBLY: DAILY OPERATING REPORT														
Date from (and including): 19-Jul-02					Date to (and including): 19-Jul-02									
SCHED	Plan	Actual	Var	Lost units							REMARKS			
				Plan Ship	Eng Plan	Shortage	Breakdown	Absentees	Other					
Shift 1	106	106	0	0	0	0	0	0	0	0				
Shift 2	106	106	0	0	0	0	0	0	0	0				
TOTAL	212	212	0	0	0	0	0	0	0	0				

SHIFT 1														
PRDN PERF		ATTENDANCE		QUALITY							SUPPL. RELTNS		WIP	
		Absentee	%	Recurring Defects			Group Leader in Call		Breakdown		Shortage		Missing SICs	
				From	Elac	Roller	Minutes	%	Minutes	%	Minutes	%		
Mezzanine	88%	1	87.2%	2	28	8	20	20.0%	0	0	0	0		
Cocapit	92%	3	79.8%	1	0	0	0	0.0%	0	0	0	0		
Door Sub-Assembly	89%	2	88.6%	1	11	4	3	21.0%	0	0	0	0		
TSS 1	89%	2	87.7%	3	8	9	0	36.0%	0	0	0	0		
TSS 2	88%	1	85.5%	8	130	8	0	32.1%	100.0%	0	0	0		
Mainline 1	81%	1	88.2%	3	0	0	0	40.0%	0	0	0	0		
Mainline 2	77%	4	86.7%	2	23	0	0	30.0%	0	0	0	0		
Trim Final	99%	0	100.0%	0	0	0	0	21.0%	0	0	0	0		
Roller Test														
HSP														
BI														
TOTAL	87%	13	82.4%	14	175	23	23	24.0%	0	0	0	0		

SHIFT 2														
PRDN PERF		ATTENDANCE		QUALITY							SUPPL. RELTNS		WIP	
		Absentee	%	Recurring Defects			Group Leader in Call		Breakdown		Shortage		Missing SICs	
				From	Elac	Roller	Minutes	%	Minutes	%	Minutes	%		
Mezzanine	72%	2	84.4%	1	14	15	15	22.0%	0	0	0	0		
Cocapit	87%	1	86.9%	3	0	0	0	11.0%	0	0	0	0		
Door Sub-Assembly	92%	0	100.0%	1	11	0	0	16.0%	0	0	0	0		
TSS 1	104%	1	92.6%	1	0	2	0	20.0%	0	0	0	0		
TSS 2	66%	2	86.8%	4	77	3	0	24.1%	100.0%	0	0	0		
Mainline 1	88%	0	100.0%	1	0	4	0	21.0%	0	0	0	0		
Mainline 2	77%	1	86.4%	2	27	0	0	20.0%	0	0	0	0		
Trim Final	99%	0	100.0%	0	0	0	0	20.0%	0	0	0	0		
Roller Test														
HSP														
BI														
TOTAL	80%	7	86.6%	13	120	27	16	16.0%	0	0	0	0		

A4 ASSY	74%	22	84.1%	27	332	58	38	43.0%	0	0	0	0		
---------	-----	----	-------	----	-----	----	----	-------	---	---	---	---	--	--



Key Activities, People and Deliverables

Analytic Types

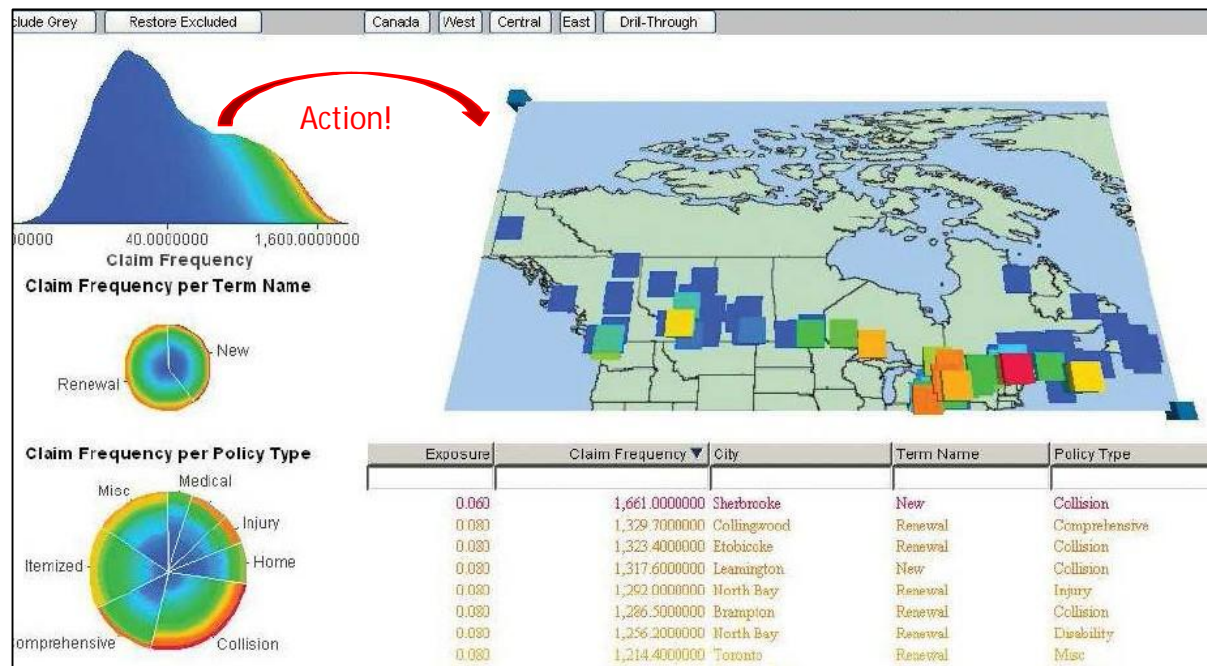
Predictive analytics answers the question, "**What is likely to happen in the future?**" Here data modeling and forecasting are used to determine future possibilities



Key Activities, People and Deliverables

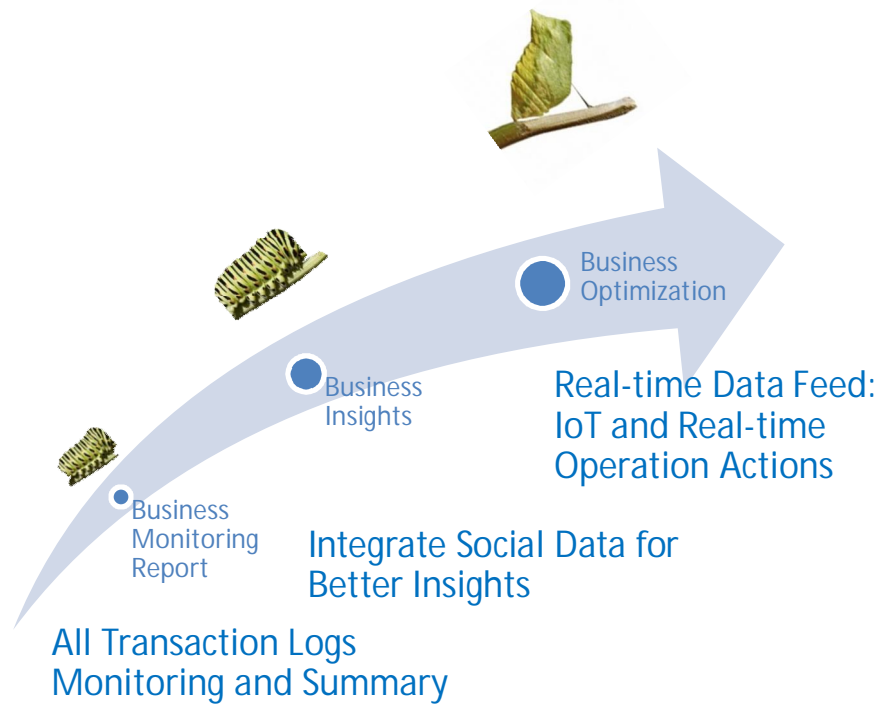
Analytic Types

Prescriptive analytics is the combination of the above to provide answers to the "So what?" and the "Now what?" For example, **what should a business do** to retain key customers? How can businesses improve their supply chain to enhance service levels while reducing costs?



mu-sigma.com

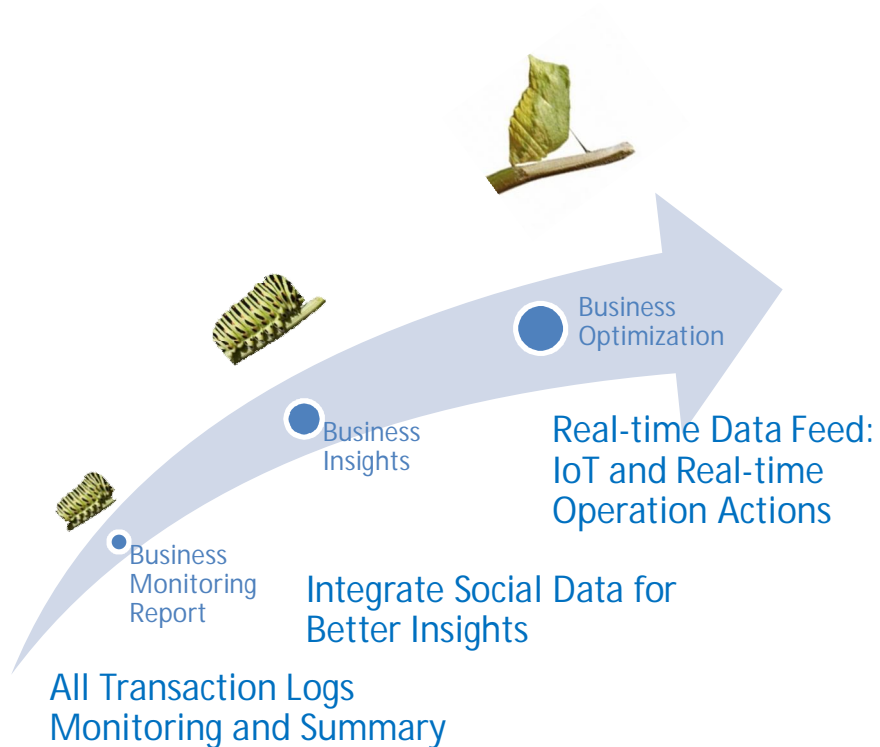
Big Data Maturity Model



Big Data Maturity Model

Business Monitoring Report

Mine all the transactional data at the lowest levels of detail



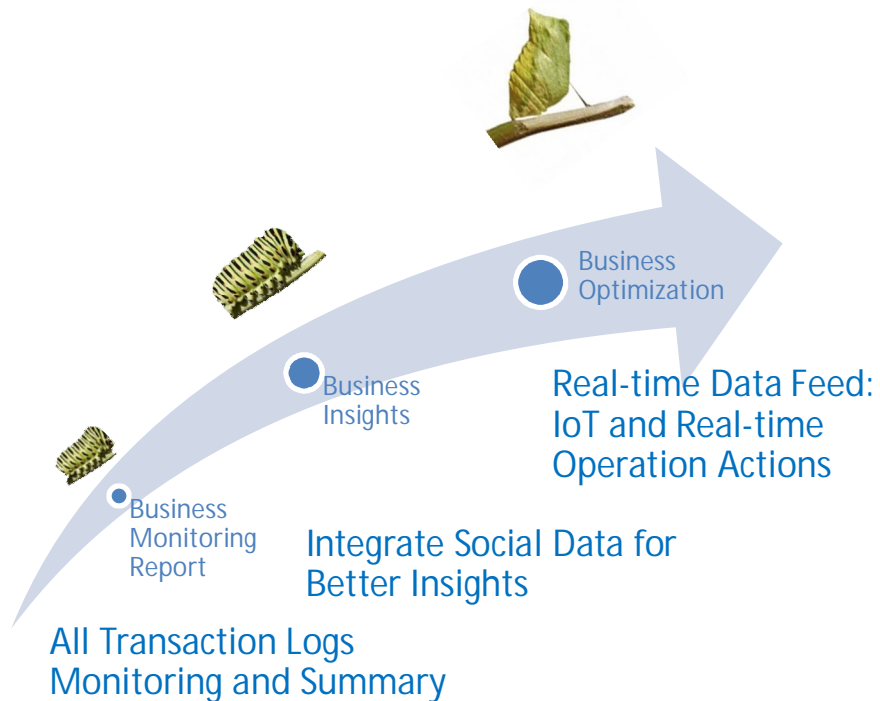
Big Data Maturity Model

Business Monitoring Report

Mine all the transactional data at the lowest levels of detail

Business Insights

Integrate unstructured data with detailed structured (transactional) data to provide new metrics and new dimensions against which to monitor and optimize key business processes.



Big Data Maturity Model

Business Monitoring Report

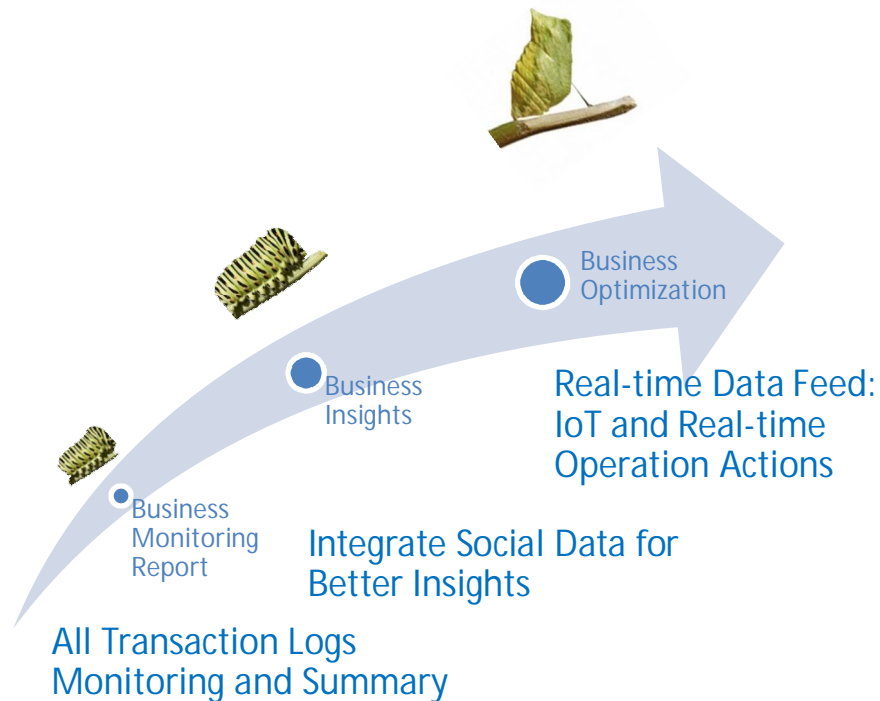
Mine all the transactional data at the lowest levels of detail

Business Insights

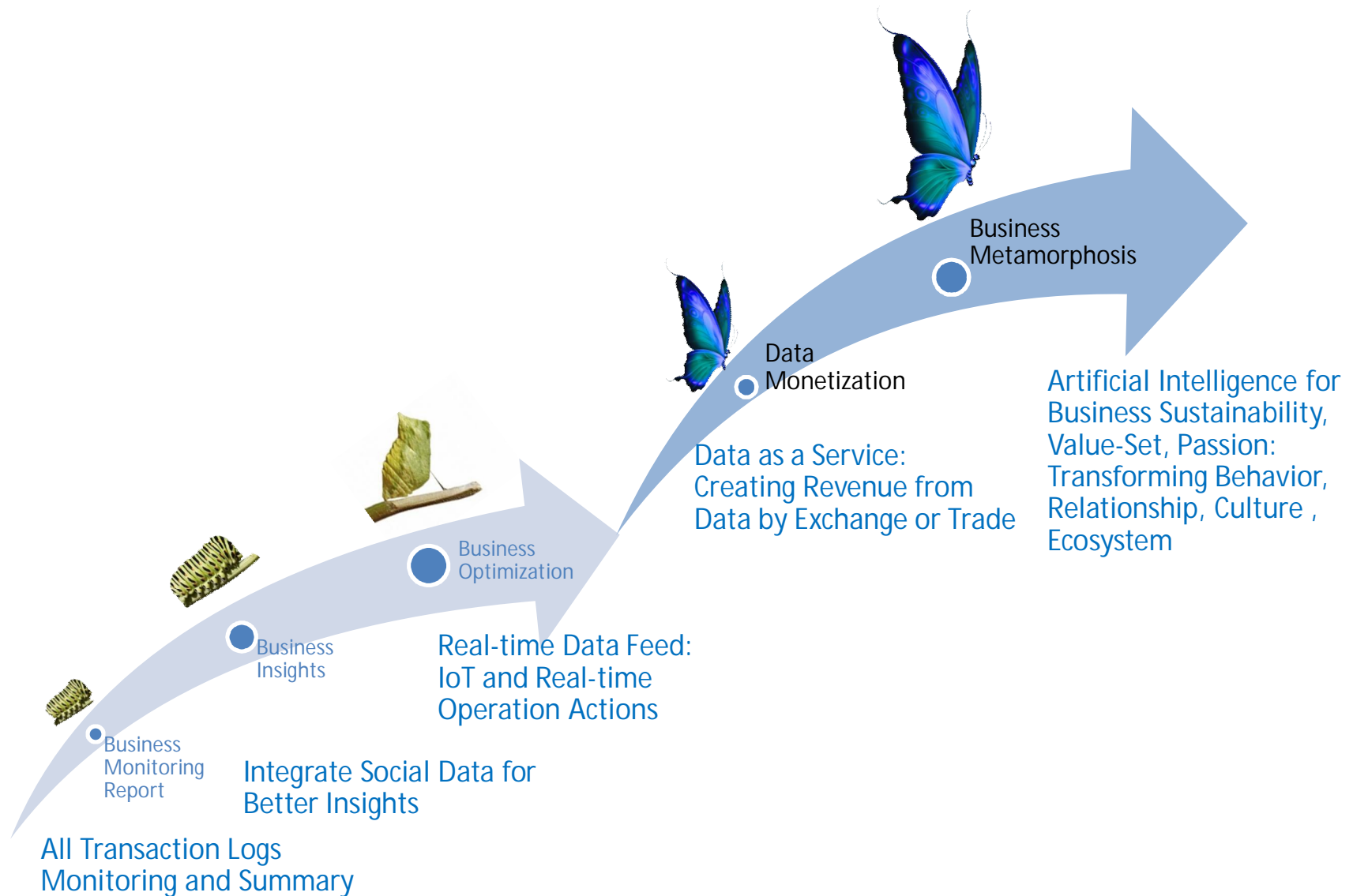
Integrate unstructured data with detailed structured (transactional) data to provide new metrics and new dimensions against which to monitor and optimize key business processes.

Business Optimization

Leverage real-time (or low-latency) data feeds to accelerate the organization's ability to identify and act upon business and market opportunities in a timely manner.



Big Data Maturity Model



Big Data Maturity Model



Integrate **predictive analytics into your key business processes** to uncover insights buried in the massive volumes of detailed structured and unstructured data. (Note: having business users slice and dice the data to uncover insights worked fine when dealing with gigabytes of data, but doesn't work when dealing with terabytes and petabytes of data.)

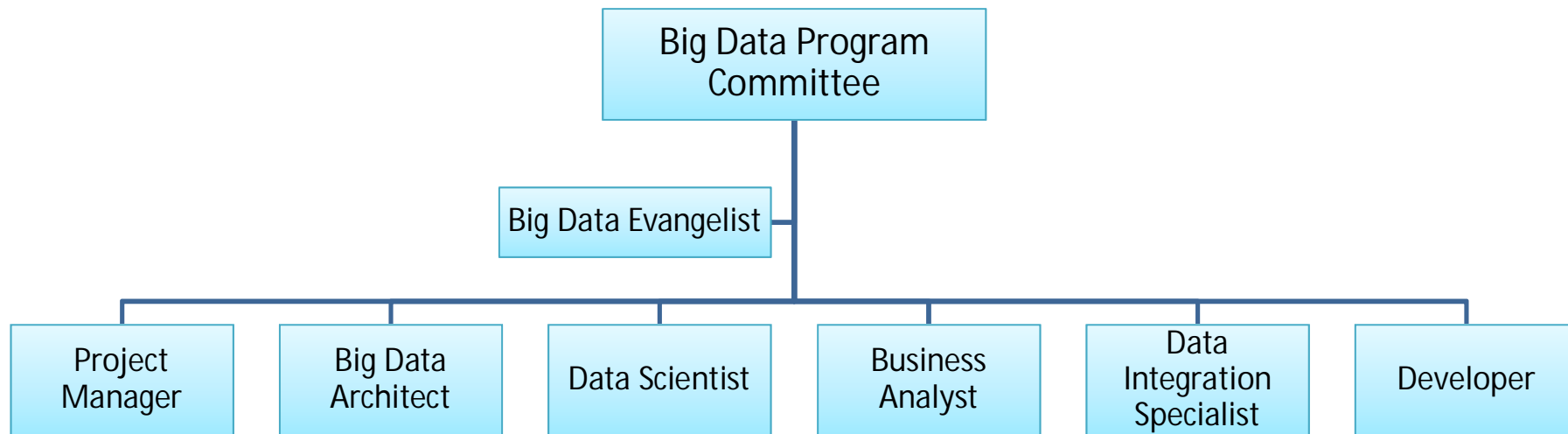
Big Data Maturity Model



Driving new business models, new processes, more meaningful business interactions, innovation, improved and faster decision making, and a more agile organization

A digital ecosystem is a business community of organizations and individuals transacting across a distributed, adaptive, open, social, technical system with collaboration, transparency, constant evolution, self-organization, scalability and sustainability.

Big Data People and Team Structure



Big Data Team Structure

No.	Roles	Description
1	Big Data Program Committee	The Team to develop Big Data initiative and deliver solution results
2	Big Data Evangelist	The business evangelist must have a combination of good communication and presentation skills and deep contextual business knowledge, as well as a clear understanding of technology in general and big data techniques.
3	Project Manager	The project manager “owns” the development schedule and is expected to ensure that the right architects, designers, and developers are brought into the project at the right times.
4	Big Data Architect	The person who has background in parallel and distributed computing architecture. This person is knowledgeable about fundamental performance “gotchas” that will impede the speed, scalability, and extensibility of any application requiring massive data volumes.

Big Data Team Structure

No.	Roles	Description
5	Data Scientist	The data scientist combines knowledge of computer science, the use of high-performance applications, and statistics, economics, mathematics, and probabilistic analysis skills.
6	Business Analyst	The person who engages with the business process owners and solicits their needs and expectations. Business analysts who are able to effectively translate business expectations into specific data analysis results.
7	Data Integration Specialist	The person who has experience in data extraction, transformation, loading, and data transformations in preparation for cleansing and delivery to target systems. Seek people with experience with data federation and virtualization, data quality, and metadata analysis.
8	Application Developer	The technical resources with the right set of skills for programming and testing parallel and distributed applications.

Big Data Project Life Cycle



- Identify Targeted Users
- Identify Target Opportunities / Key Measurements
- Identify Data Sources/Types
- Identify Data Capturing Approaches
- Identify Data Processing and Visualization Planning
- Identify Big Data Platform
- Identify Security
- Identify Governance and Change Control for Operation
- Identify Team Structure
- Identify Phasing, Budget and Cost

- Develop Use Cases
- Develop Requirements Definition
- Develop Big Data Solution Framework
- Develop the Development and Test Environment
- Develop Data Capture
- Develop Analytics
- Integrate Visualization
- Manage Assets and Configurations

- Monitor Big Data Platform Availability, Utilization and Capacity Planning
- Manage Operation Tasks (Admin. Scripts, Commands), Data Capturing System, Upgrading or Patching
- Manage Service Requests and Incidents
- System admin. Training
- Helpdesk Training
- End-User Training (Analytic Results)

- Adoption Rates for each analytics results
- No. of Missing Analytic Results
- No. of Missing Data
- Lost hours per month
- Avg. of each Analytic Result Response Time
- No. of Technology System Failure per month
- Evaluate Activity Conformance with Policies

Key Activities, People and Deliverables

No.	Phases	Activities	People	Deliverables
1	Planning	Identify Targeted Users	Big Data Program Committee	Big Data Discovery Worksheet
2	Planning	Identify Target Opportunities	Big Data Program Committee	Big Data Discovery Worksheet
3	Planning	Identify Team Structure	Big Data Program Committee	Team Organization Chart
4	Planning	Identify Data Sources/Types	Big Data Architect, Data Scientist, Data Integration Specialist	Data Sources Types Information
5	Planning	Identify Data Capturing Approaches	Data Integration Specialist, Data Scientist	Data Capturing Information
6	Planning	Identify Data Processing and Visualization Planning	Business Analyst, Big Data Architect, Data Scientist, Developer	Data Processing Framework and User Interface Summary
7	Planning	Identify Big Data Platform	Big Data Architect, Project Manager	Big Data Platform Summary
8	Planning	Identify Security	Corporate Information Security, Big Data Architect, Project Manager	Security Scope Summary
9	Planning	Identify Governance and Change Control for Operation	Internal Control Team, Corporate Information Security, Big Data Architect, Project Manager	Governance, RACI, Change Procedures Summary
10	Planning	Identify Phasing Budget and Cost	CIO, CFO, Project Manager, Business Analyst	Project Investment Summary

Key Activities, People and Deliverables

No.	Phases	Activities	People	Deliverables
1	Development	Develop Use Cases	Business Users, Business Analyst, Big Data Architect, Big Data Evangelist	Use Cases Summary
2	Development	Develop Requirements Definition	Business Users, Business Analyst, Big Data Architect	Requirements Summary
3	Development	Develop Big Data Solution Framework	Big Data Architect	Solution Component Diagram
4	Development	Develop the Development and Test Environment	Big Data Architect, Data Integration Specialist, Developer	Development and Test Environment
5	Development	Develop Data Capture	Data Integration Specialist, Developer	Data Capturing Module
6	Development	Develop Analytics	Data Integration Specialist, Developer	Data Analytic Module
7	Development	Integrate Visualization	Data Integration Specialist, Developer	User Interface and Visualization Results
8	Development	Manage Assets and Configurations	Project Manager, Big Data Architect, Corporate Information Security, Head of IT Operation	Assets Inventory and Configurations Change Procedure

Agile Methodology may apply in Big Data Development Phase.

Key Activities, People and Deliverables

No.	Phases	Activities	People	Deliverables
1	Operation and Support	Monitor Big Data Platform Availability, Utilization and Capacity Planning	IT Operation Team	Availability, Utilization and Capacity Planning Report
2	Operation and Support	Manage Operation Tasks (Admin. Scripts, Commands), Data Capturing System, Upgrading or Patching	IT Operation Team, Big Data Architect	Schedule or Ad-Hoc Operation Activities
3	Operation and Support	Manage Service Requests and Incidents	IT Operation Team	Service Requests and Incidents Procedures
4	Operation and Support	System Administration Training	Big Data Architect, Data Integration Specialist, Developer, IT Administration, IT Operation	System Administration and Operation Training Activity
5	Operation and Support	Helpdesk Training	IT Administration, IT Operation, IT Helpdesk	Helpdesk Training Activity
6	Operation and Support	End-User Training (Analytic Results)	Business Analyst, Business Users	End-User Training Activity

Key Activities, People and Deliverables

No.	Phases	Activities	People	Deliverables
1	Evaluation	Create Adoption Rates for each analytics Results	IT Operation	Percent of user adoption
2	Evaluation	Create No. of Missing Analytic Results	Big Data Program Committee	No. of Missing Analytics Report
3	Evaluation	Create No. of Missing Data Results	Big Data Program Committee	No. of Missing Data Report
4	Evaluation	Create Lost hours per month Results	Big Data Architect, Data Scientist, Data Integration Specialist	Lost hours per month Report
5	Evaluation	Create Avg. of each Analytic Processing and Response Time Results	Data Integration Specialist, Data Scientist	Analytic Processing and Response Time Report
6	Evaluation	Create No. of Technology System Failure per month Results	Business Analyst, Big Data Architect, Data Scientist, Developer	Technology System Failure per month Report
7	Evaluation	Evaluate Activity Conformance with Policies	Big Data Architect, Project Manager	Change Control Log Report

Business Analytics vs. Business Intelligence Activities Worksheet

Samples

Who (Who care)	What	Service Type	Why (Objectives)	When (to be released)	Digital Data Source
Customer	Mobile BI App and Alerts	New Services	Digital innovation program alignment	Adhoc, Weekly	CRM App, Plant Data, ERP Data
CEO	Business Performance Report	Optimized Services	Stake holder benefits 100%	Weekly	ERP System, Fin. Spreadsheets
CMO	Target Customer Recommendation Report	New Services	Expand revenue 10% by end of quarter	Adhoc, Weekly	Social Network, Twitter
COO	% Reduce waste in Plant	Optimized Services	Reduce cost (opex) 15% by end of year	Weekly	Plant data
CFO	Cash flow Report and Alerts	Optimized Services	Support Risk Control and reduce cost (opex) by 15%	Adhoc, Monthly	ERP System, Fin. Spreadsheets
Business Partners	Activity Tracking Alert	New Services	Increase productivity 20%	Daily	CRM App, Plant Data, ERP Data

Business Analytics vs. Business Intelligence Activities Worksheet

Who (Who care)	What	Service Type	Why (Objectives)	When (to be released)	Digital Data Source

Sample Customer Data Quality Management Worksheet

N o.	Master/ Transactional / Summary Data	Data Name	Owner	Used by Critical Business Processes (Y/N)	Use By Executive Reports (Y/N)	Change Control (Y/N)	Sample Data Structure, Data Type, Data Range	Current Issues With % of Records are align with its profiling	Remarks
1	Master	Customer-Individual	Retail-Marketing	Y, Core Retail Sales process	Y, Customer Profitability Reports	Y	See atth.	75%	Goals 100% of data quality completion
2	Master	Customer – Organization	Corporate-Marketing	Y, Core Corporate Sales Process	Y, Customer Profitability Reports	Y	See atth.	99%	Goals 100% of data quality completion

Enterprise Data Quality Worksheet

N o.	Master/ Transactional / Summary Data	Data Name	Owner	Used by Critical Business Processes (Y/N)	Use By Executive Reports (Y/N)	Change Control (Y/N)	Sample Data Structure, Data Type, Data Range	Current Issues With % of Records are align with its profiling	Remarks

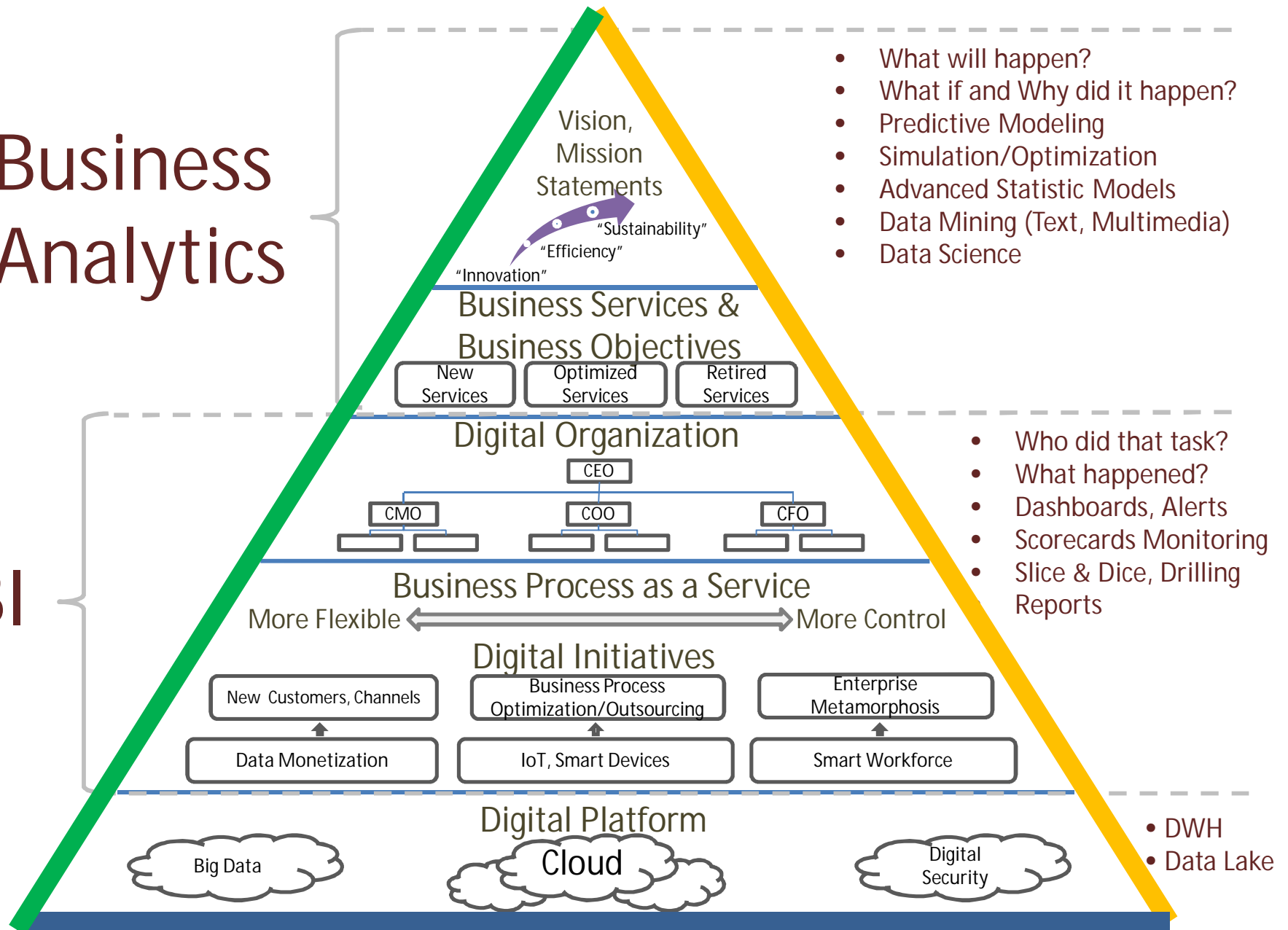
Big Data Governance Worksheet

N o.	Master/ Transactional/ Summary Data	Data Name	Owner	Used by Critical Business Service (Y/N)	Volume (MB/GB/TB)	Varieties of Types (Text, XML, JSON, Image, Sound, VDO, etc.)	Velocity (How fast data change in minutes)	Change Control (Y/N), Change Procedure	Current Issues

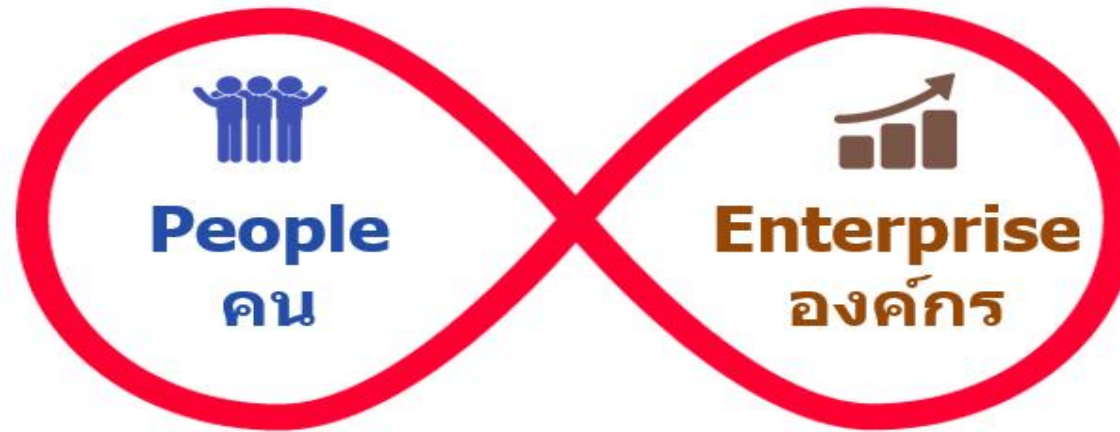
Summary

Business Analytics

BI



Part 4



People Transformation

อ.ดนัยรัฐ ธนบดีธรรมจารี

Line ID: Danairat

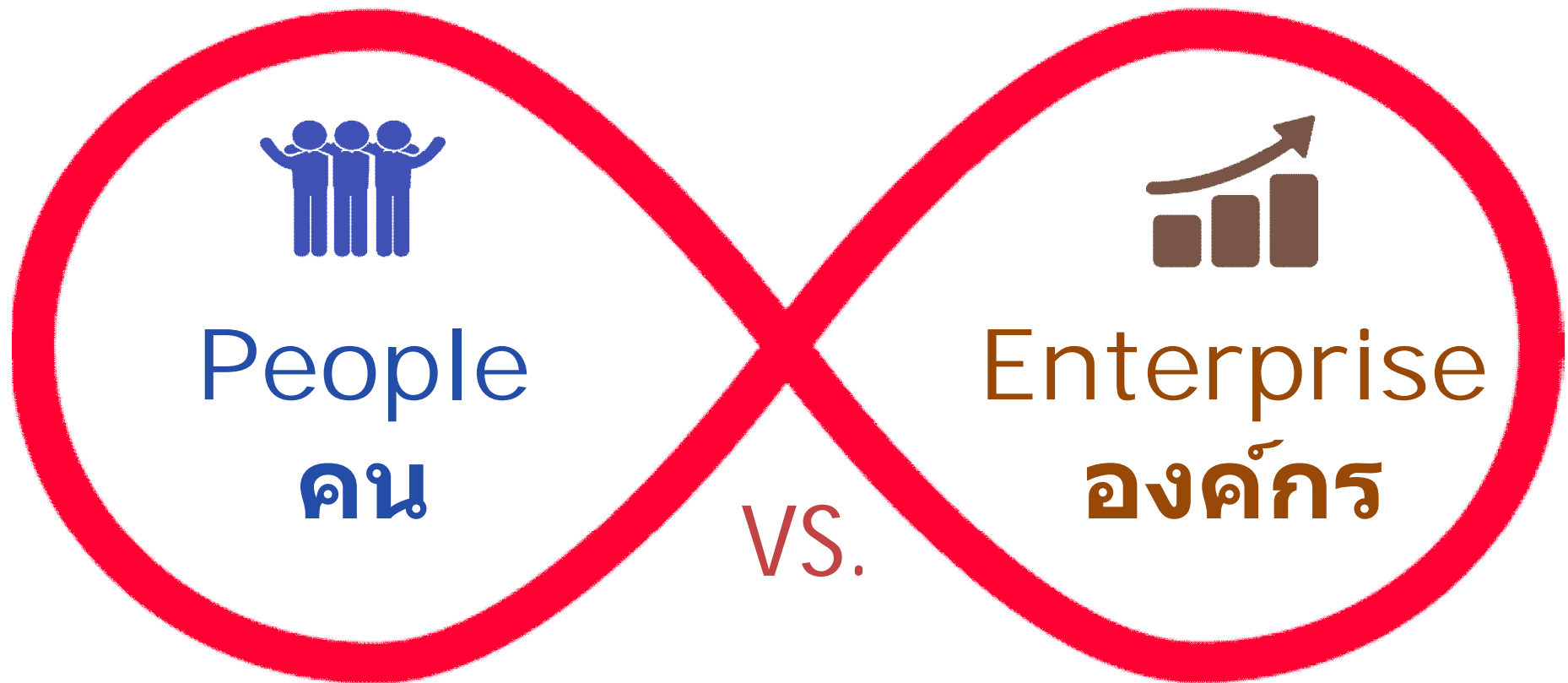
FB: Danairat Thanabodithammachari

+668-1559-1446

The Digital Transformation

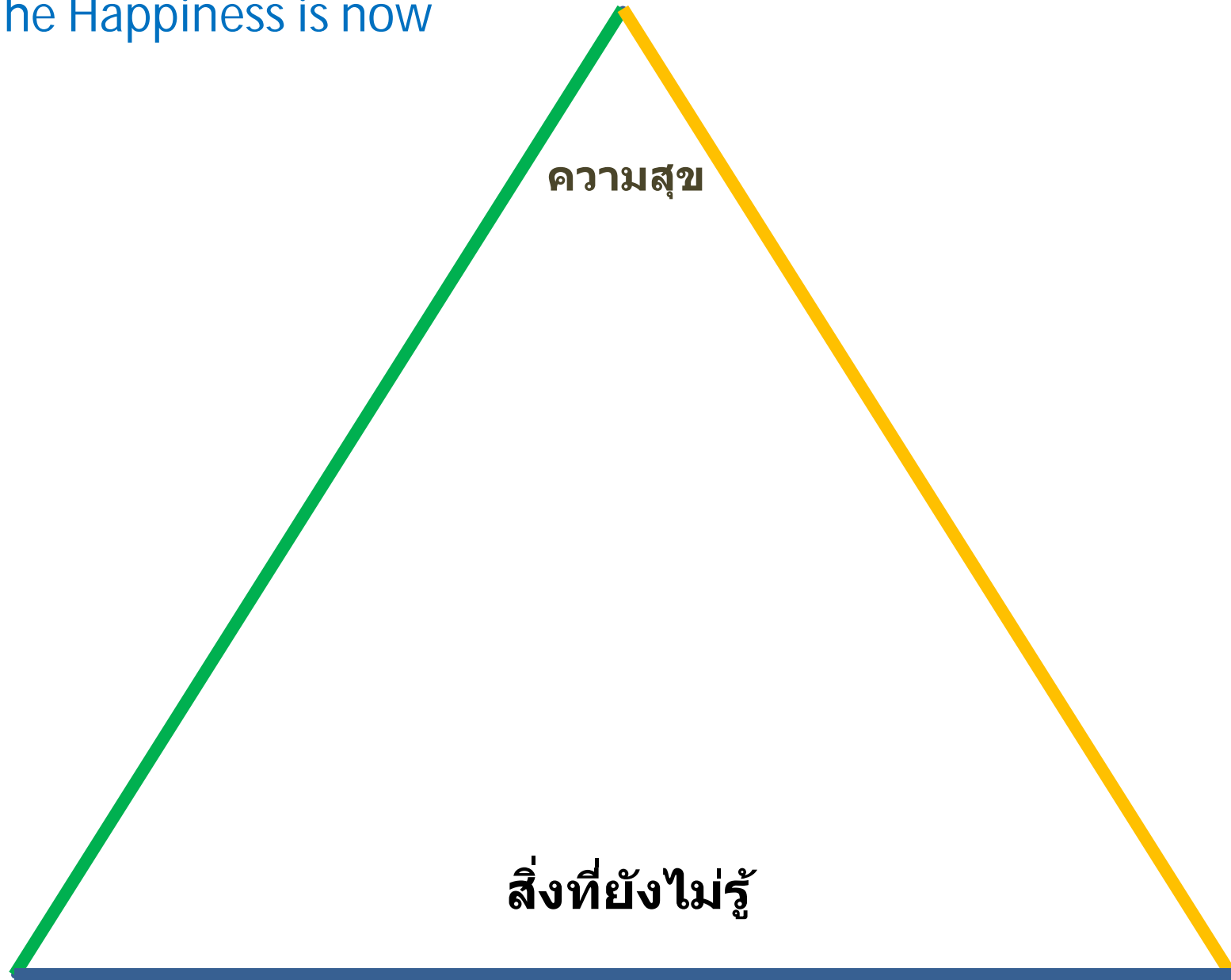
Where the transformation starts!?

No right and no wrong



People Transformation Reference Model

The Happiness is now



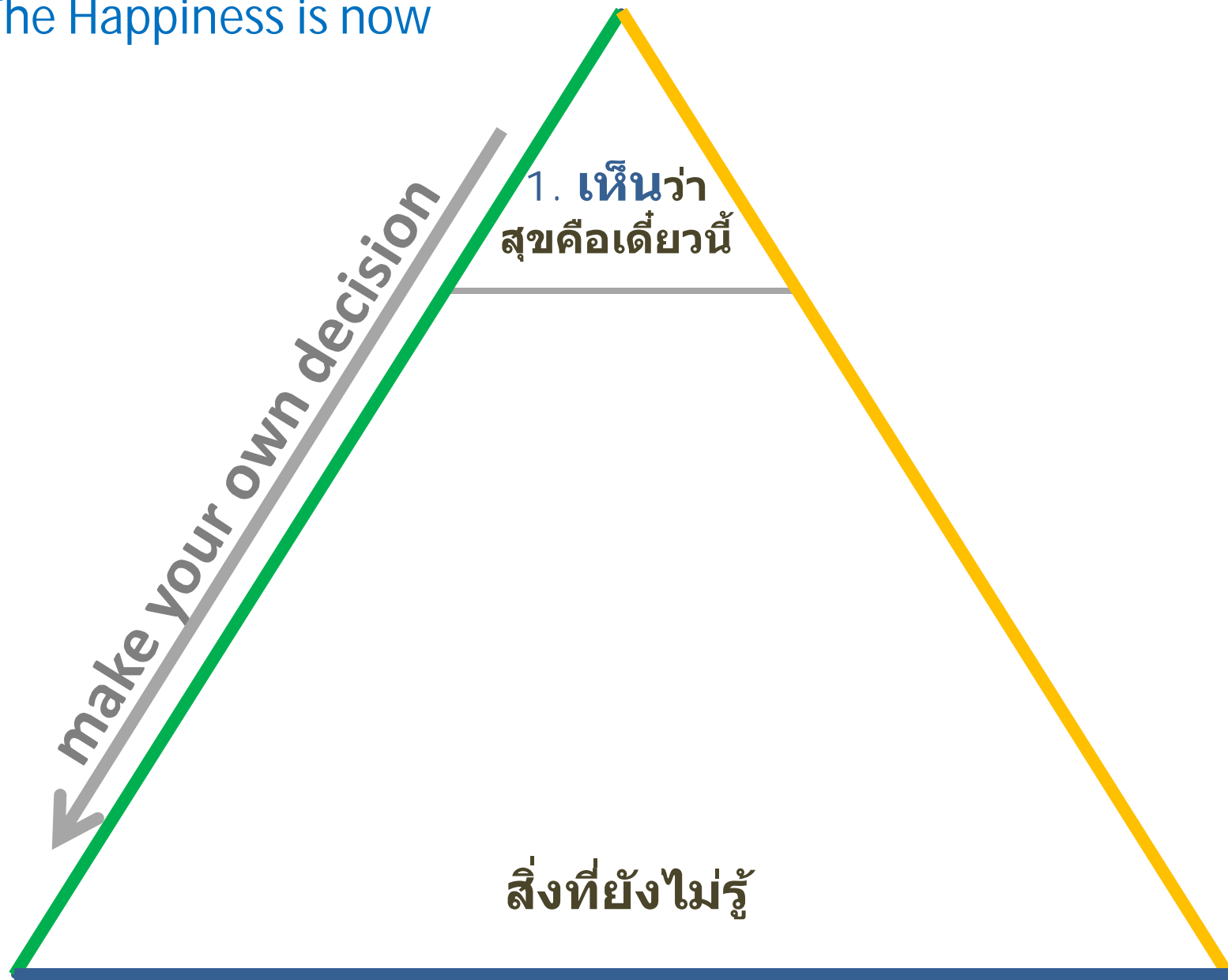
People Transformation Reference Model

The Happiness is now



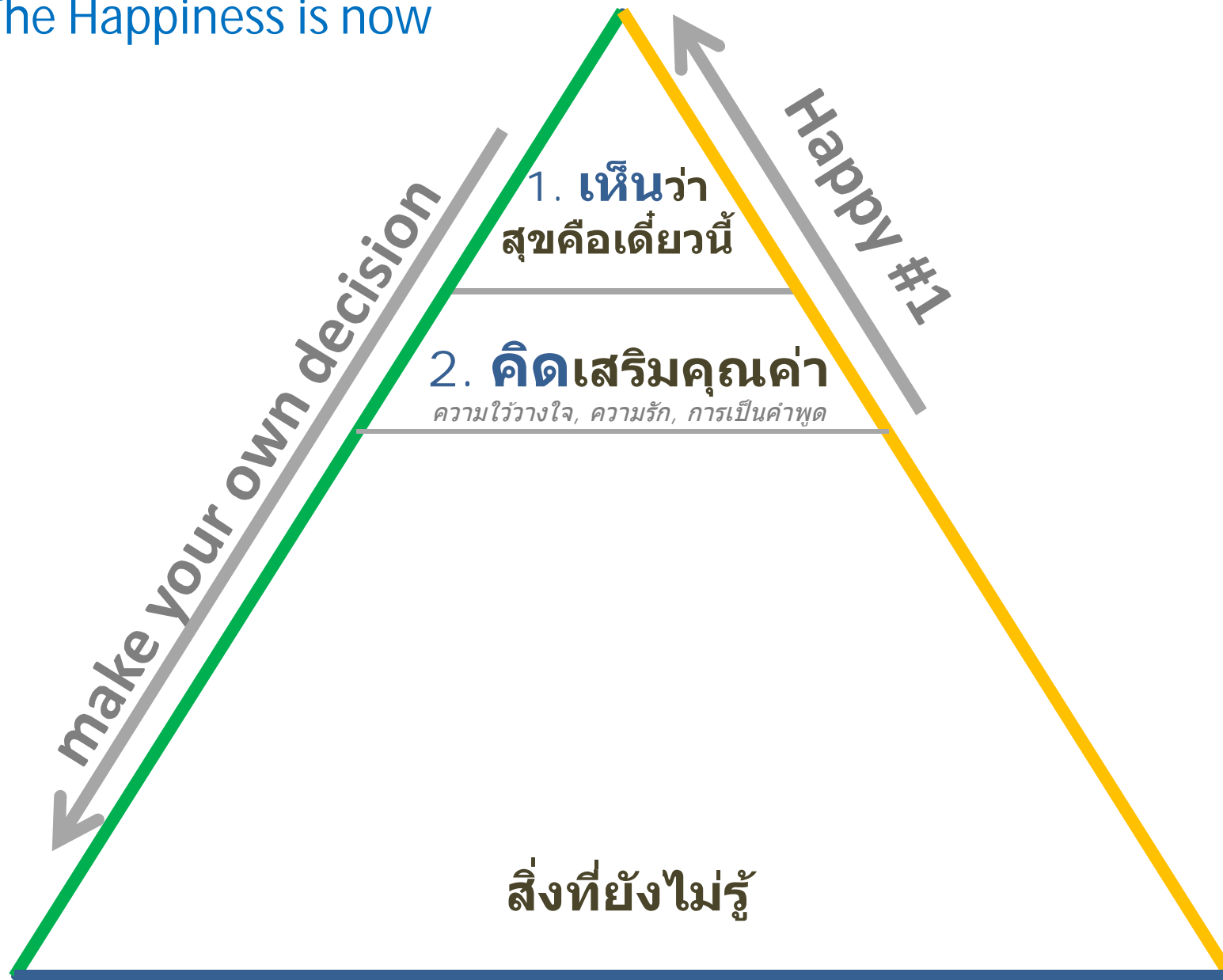
People Transformation Reference Model

The Happiness is now



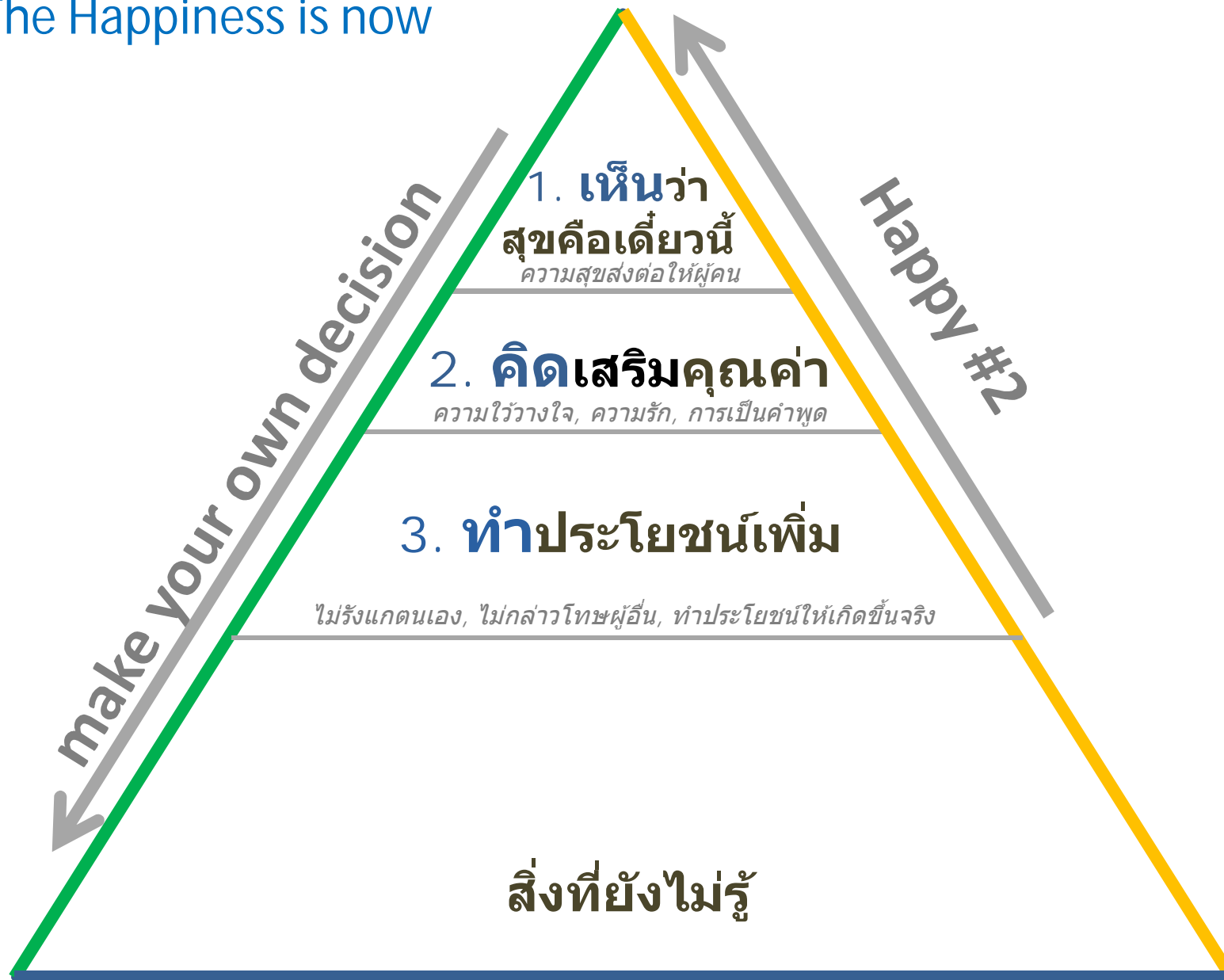
People Transformation Reference Model

The Happiness is now



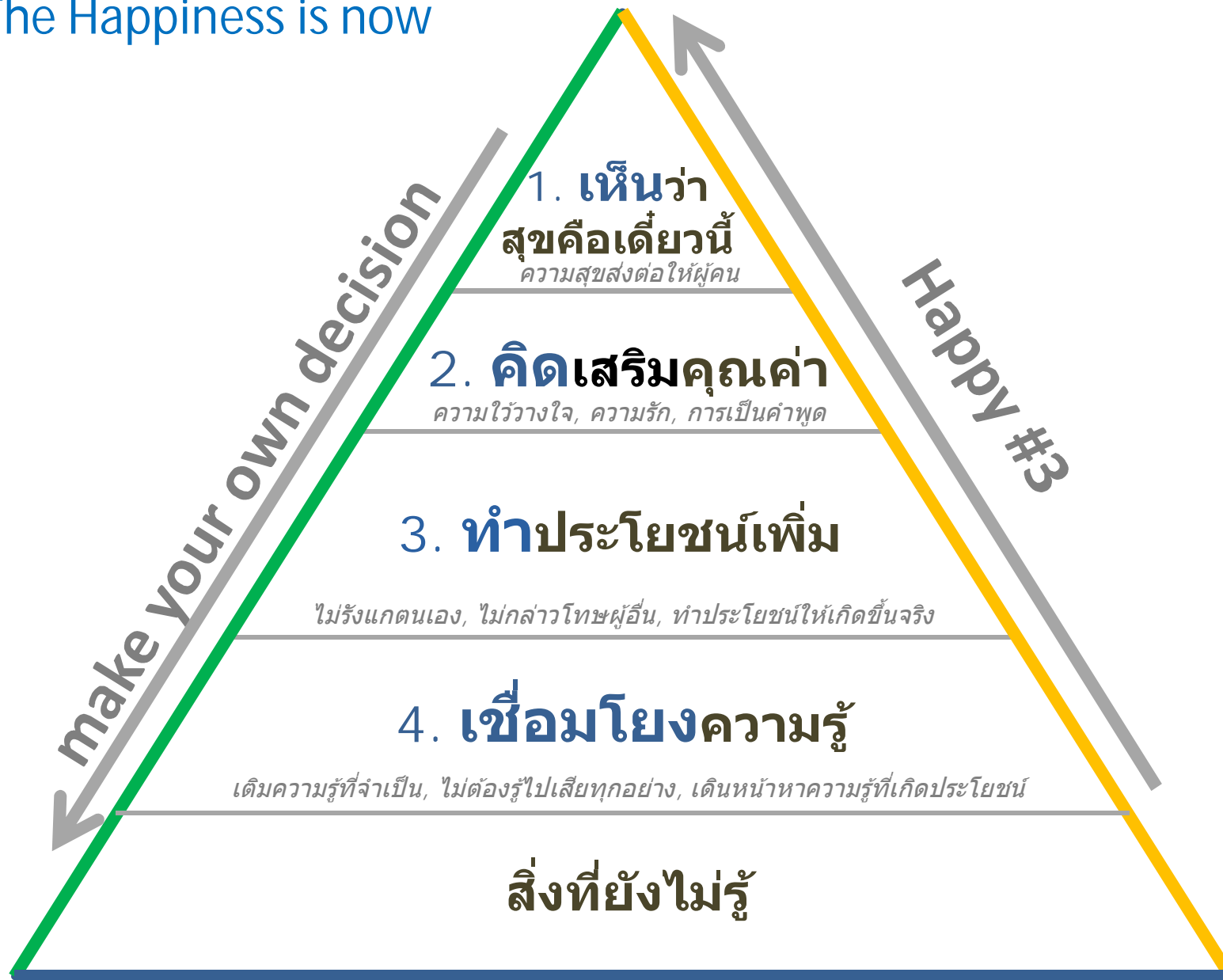
People Transformation Reference Model

The Happiness is now



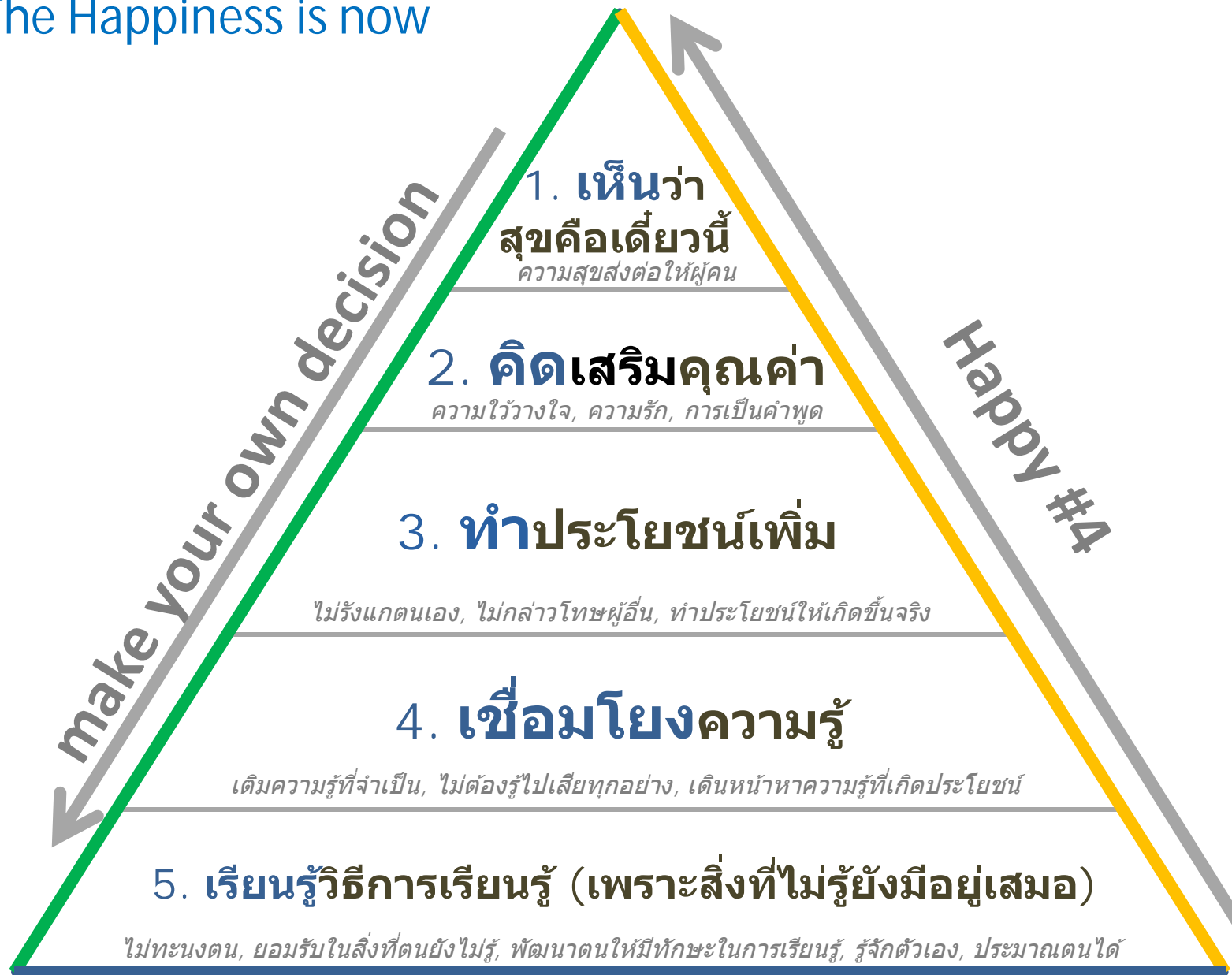
People Transformation Reference Model

The Happiness is now



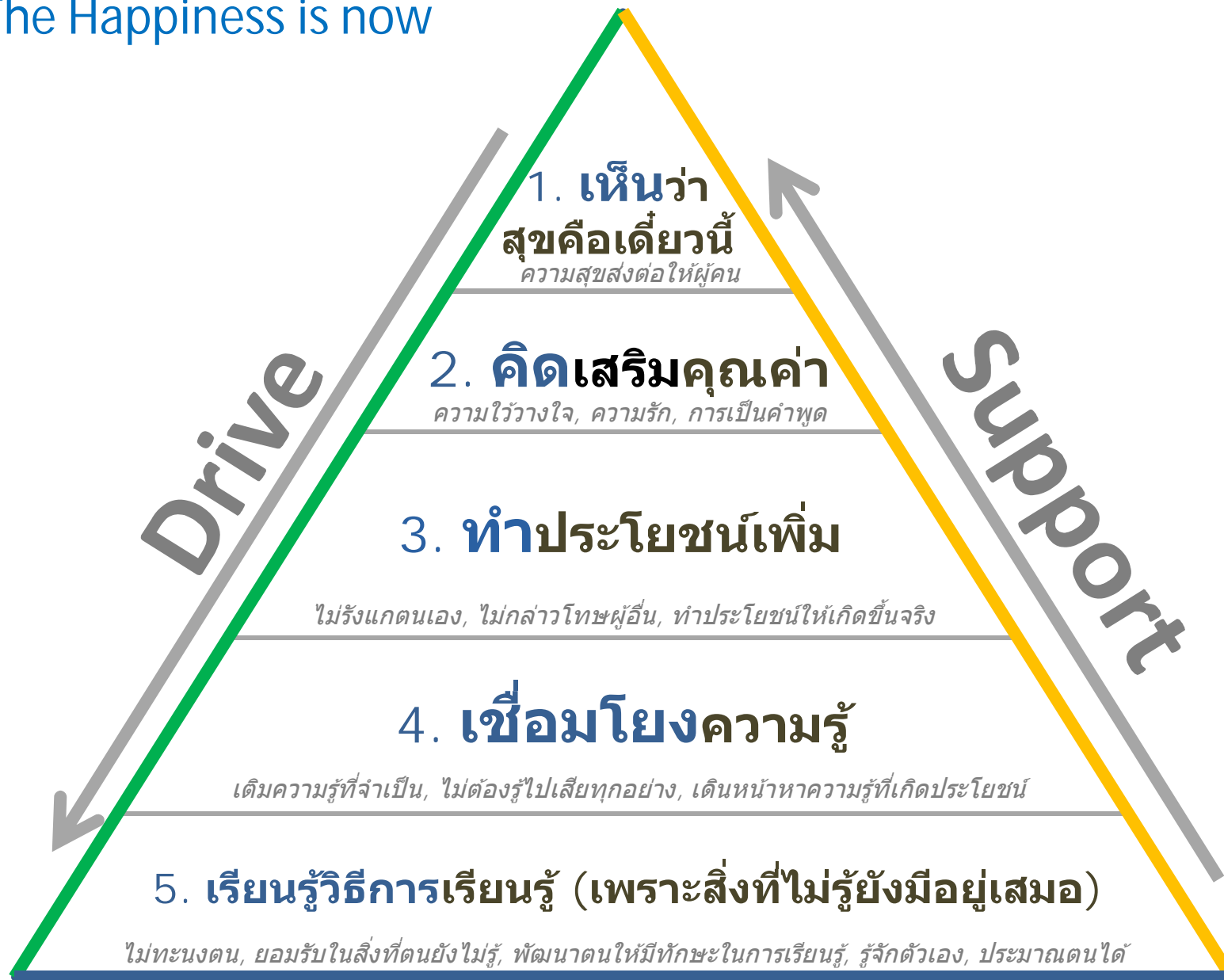
People Transformation Reference Model

The Happiness is now



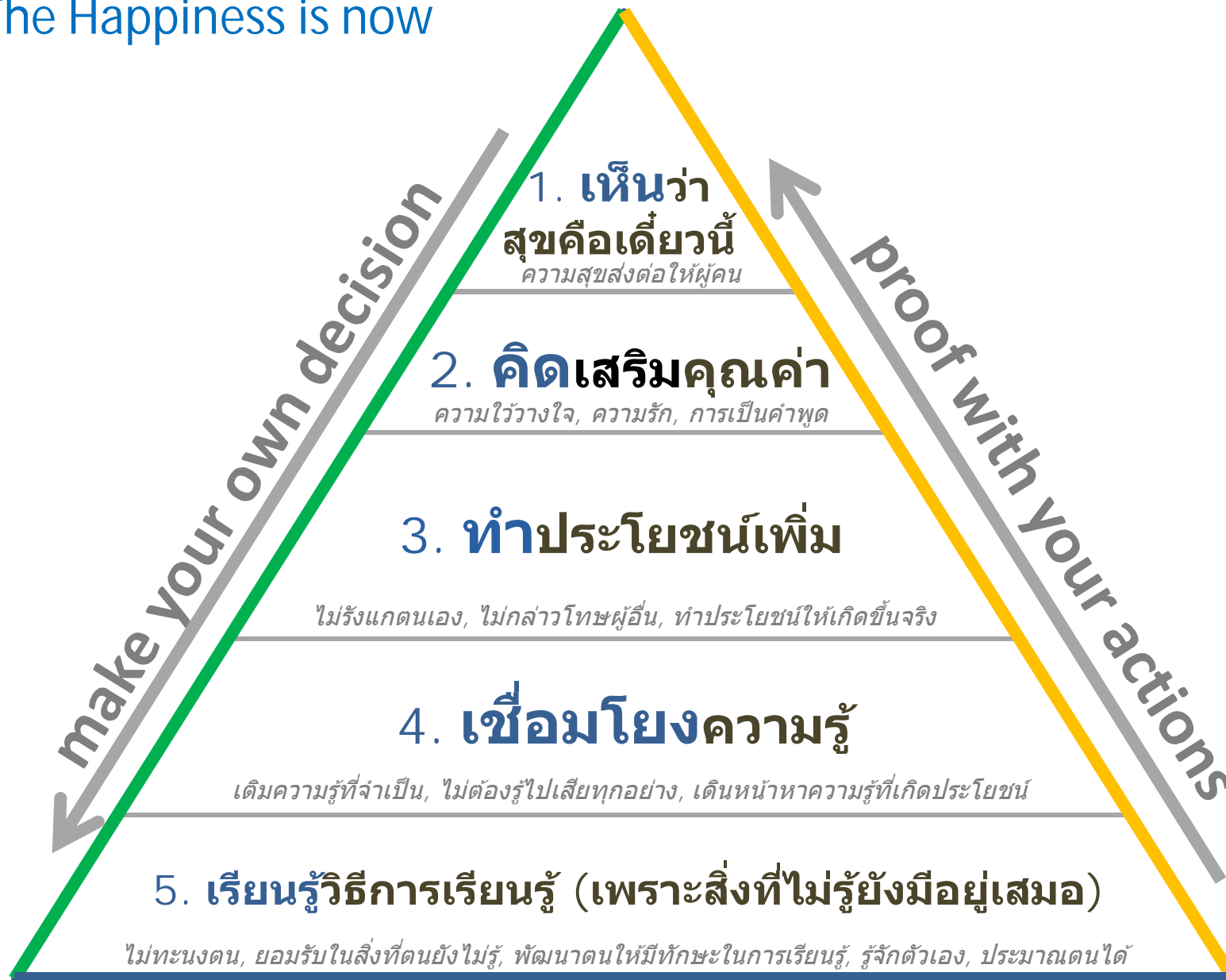
People Transformation Reference Model

The Happiness is now



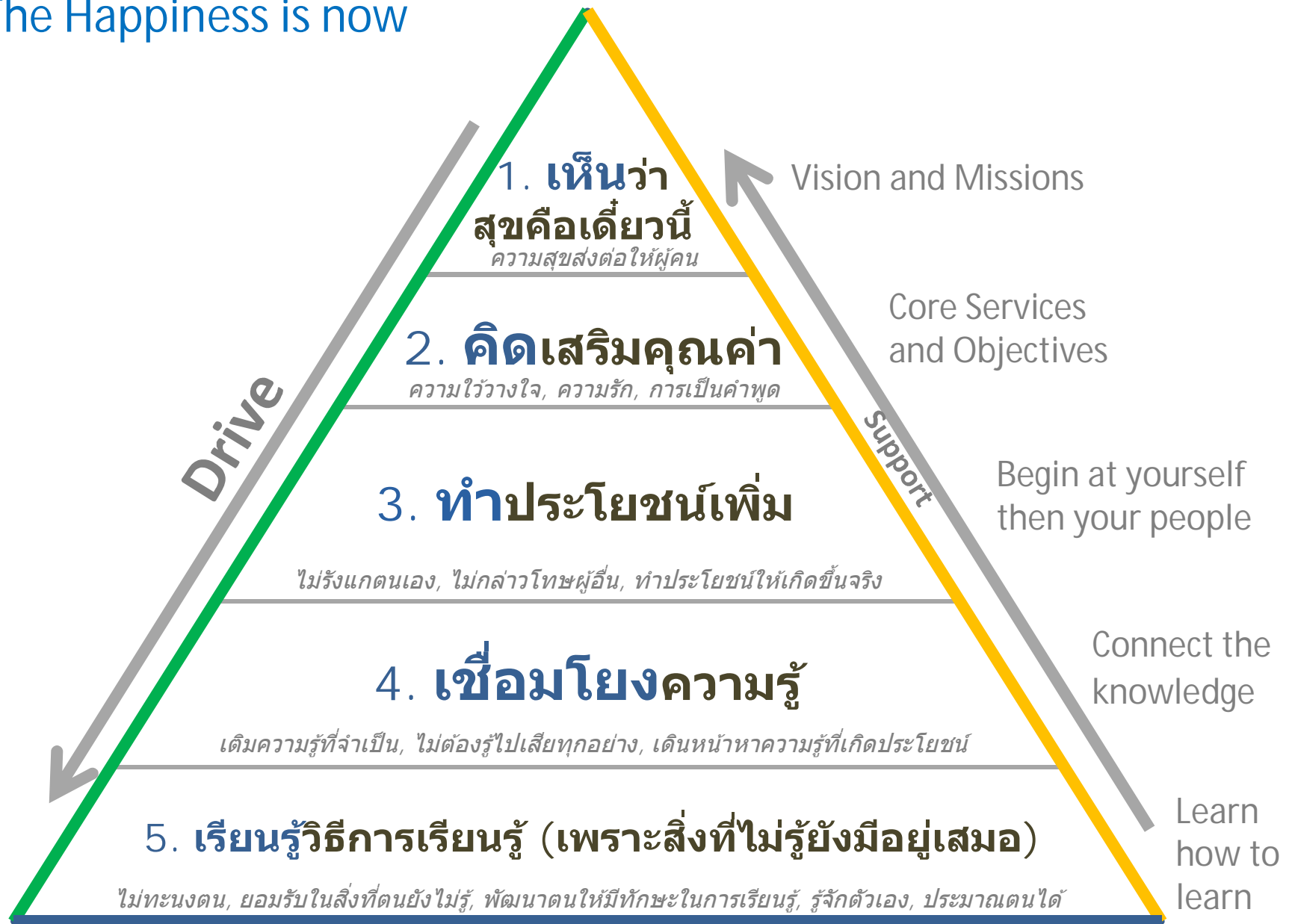
People Transformation Reference Model

The Happiness is now



People Transformation Reference Model

The Happiness is now



Thank you

อ.ดนัยรัฐ ธนบดีธรรมจารี

Line ID: Danairat

FB: Danairat Thanabodithammachari

+668-1559-1446