

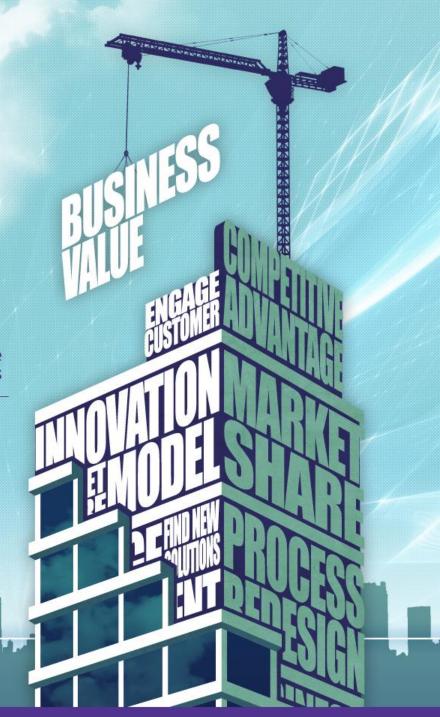
全球發展趨勢與應用

Enterprise Architecture Global Trends And Applications

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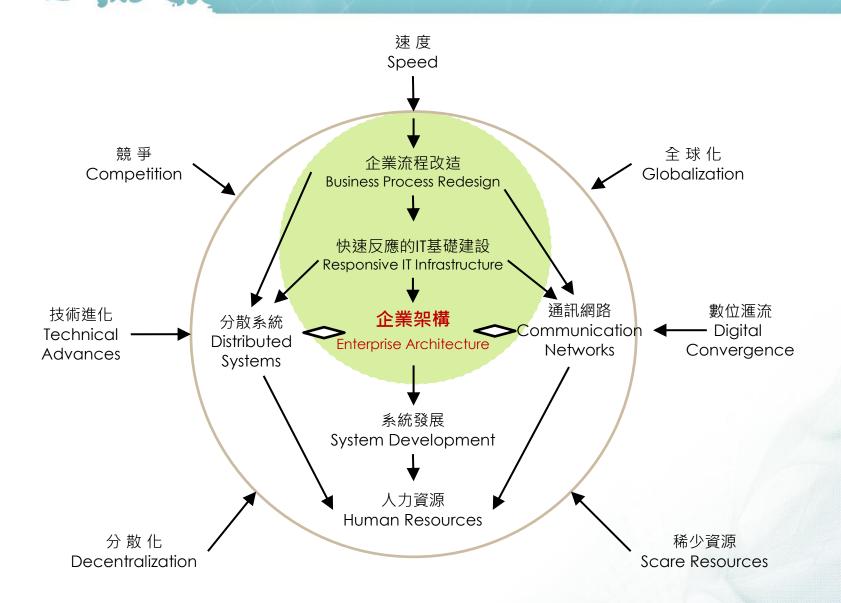
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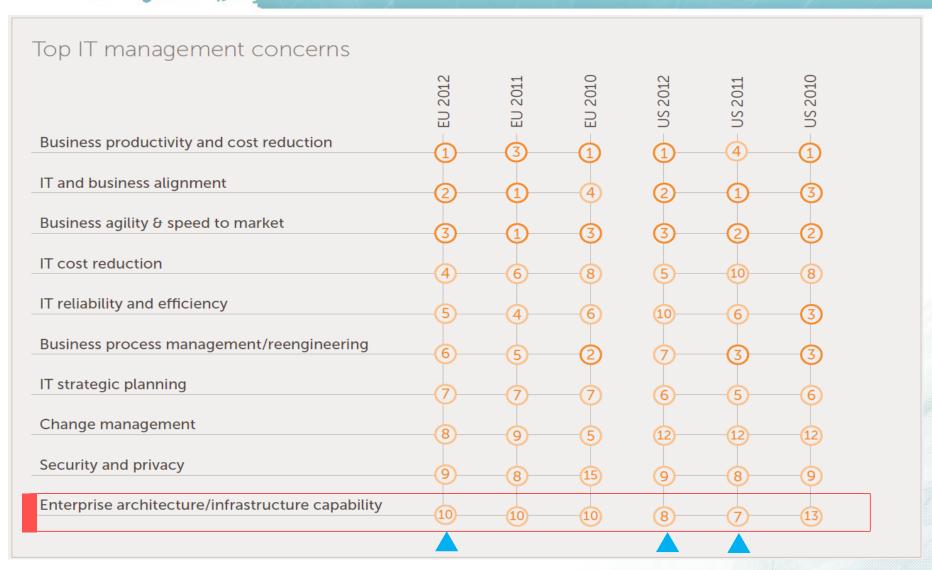




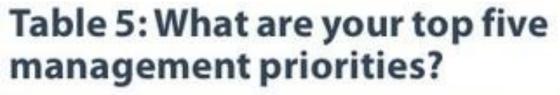
### 資訊高階主管關切議題的調查



### 資訊高階主管關切議題的調查



This paper presents the major findings based on survey responses from 501 organizations (195 U.S. and 306 European (mainly West Europe)) in mid to end 2012. Including the other continents 758 organizations were involved.





2012	2013
Aligning IT & business goals	Aligning IT & business goals
Controlling costs	Business continuity/risk management
Business continuity/risk management	Controlling costs
Improving internal customer (user) satisfaction	Enterprise architecture
Process improvement	Process improvement

Source: State of Asian CxO Survey 2013, T.C. Seow | Oct. 16, 2013

## IS 2010: Curriculum Guidelines for in MIS

IS 2010.1 Foundations of Information Systems



IS 2010.2 Data and Information Management IS 2010.3 Enterprise Architecture

IS 2010.4 IS Project Management

IS 2010.5 IT Infrastructure Systems
Analysis &
Design



IS 2010.7 IS Strategy, Management, and Acquisition

Figure 7: IS 2010 Core Courses

## Curriculum Guidelines for Undergraduate Degree Programs in MIS

#### Structure of the IS Model Curriculum:Information Systems specific courses

Career Track:	Α	В	С	D	Е	F	G	Н	L	J	K	L	М	N	0	Р	Q		A = Application Developer
Core IS Courses:																			B = Business Analyst
Foundations of IS	•		•	•	•	lacksquare	•	•	lacksquare	•	•		lacktriangle	•		•	lacktriangle		C = Business Process Analyst
Enterprise Architecture	0	•	0	0	0	•	0	0	0	0	•	0	0	0	•	0	0		D = Database Administrator
IS Strategy, Management and Acquisition	0	•	0	0	0	•	0	0	•	0	•	0	0	0	•	0	0		E = Database Analyst
Data and Information Management	•	0	0	•	•	0	0	•	•	0	•	0	•	0	0	0	0		F = e-Business Manager
Systems Analysis & Design	•	•	•	0	O	O	•	0	O	0	0	O	0	0	•	•	•		G = ERP Specialist
IT Infrastructure	0	0	0	•	0	0	0	•	•	•	0	0	•	•	0	0	0		H = Information Auditing and Compliance Specialist
IT Project Management	•	0	0	0	0	•	0	0	0	0	•	0	0	0	•	•	•		I = IT Architect
																			J = IT Asset Manager
Elective IS Courses:																		ĺ	K = IT Consultant
Application Development	•	O	0	0	O	O	0	O	O	0	0	O	0	0	O	•	•		L = IT Operations Manager
Business Process Management		•	•			O	0	O		0	•				O				M = IT Security and Risk Manager
Collaborative Computing						O			П			П		0			0		N = Network Administrator
Data Mining / Business Intelligence		•		•	•	O	0	O	•		0	O	0	0	O		0		O = Project Manager
Enterprise Systems		•	•	0	O	O	•	•	O		•	•	0	O					P = User Interface Designer
Human-Computer Interaction	•					O	0		П		0					•			Q = Web Content Manager
Information Search and Retrieval		O		0	•				П			П	0				•		
IT Audit and Controls	0	П	•	0	O	O	0	•	П	•	0	П	0	0	O		0		
IT Security and Risk Management	O			0	0	O	0	•	•	0	0		•	•	O		O		
Knowledge Management		•		0		O	0		П	0	$\Box$	$\Box$							
Social Informatics	П	П						П	П		П	П	O		O		П		

#### Key:

Significant Coverage

O = Some Coverage

Blank Cell = Not Required

### Salary Level of EA, USA





Title: Enterprise architect

National Base: 64 Profile Base: 64

In 2013, a typical person employed as a Enterprise architect could expect

to earn an average compensation of \$128,810.

That compensation figure includes salary and bonus.

How do you compare?	2013 Total	2012 Total	Increase or Decrease
Average of Enterprise architect fitting this profile	\$128,810	\$124,875	3.2%
National average for Enterprise architect	\$128,810	\$124,875	3.2%

#### Job description for Enterprise architect

Creates, maintains and evolves the enterprise architecture framework so that it is aligned with and supports an organization's business strategy. Tasks focus on defining data relationships, mapping information flows and implementing business processes, applications, data and technology in order to respond to changing business needs. Requires both technology and business competencies.

## Technology salaries - London

ARCHITECTURE & DEVELOPMENT	2012	2013	Change
Enterprise Architect	£74,500 - £127,750	£76,250 - £130,500	2.2%
Technical Architect	£75,250 - £115,250	£77,000 - £117,750	2.2%
Infrastructure Architect	£74,250 - £102,750	£76,000 - £105,250	2.4%
Data Architect	£73,750 - £105,750	£75,500 - £108,500	2.5%
Solutions Architect	£55,500 - £94,750	£56,750 - £96,750	2.2%
Development Manager	£84,750 - £119,250	£86,750 - £121,750	2.2%
Lead Developer	£56,500 - £115,000	£58,000 - £118,250	2.8%
Software Developer	£34,750 - £85,500	£35,500 - £88,000	2.7%
Database/Business Intelligence Developer	£43,750 - £66,250	£45,750 - £69,250	4.5%
Quantitative Developer	£65,000 - £121,500	£68,000 - £127,500	4.8%

### Salary Level of EA, Taiwan



## SALARY&EMPLOYMENT FORECAST

Salary tables



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Presented in association with The European Chamber of Commerce Taiwan

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### **DEVELOPMENT, DESIGN & ARCHITECTURE**

Experience	3 to 5 Years	5 to 10 Years	10 to 15 Years	More than 15 years
Salary	NT\$'000	NT\$'000	NT\$'000	NT\$'000
Analyst Programmer	540–660	660–780	840–1,080	-
Lead Analyst Programmer	-	840–960	1,080–1,320	-
Architect - Applications, Solutions, Systems, Data	-	960–1,320	1,320-1,560	-
Enterprise Architect	-	960-1,320	1,320–1,560	1,560–2,400
Application Development Manager	-	960–1,320	1,440–1,680	1,680–2,160

## HARVEY NASH CIO SURVEY 2013

#### **ABOUT THE PARTICIPANTS**

2,029

\$103<sub>BN</sub>

NUMBER OF PARTICIPANTS

COMBINED IT SPEND

MAJORITY OF CIOS HAVE 'GLOBAL' RESPONSIBILITY 'CEO'
MOST COMMON
REPORTING LINE

#### **TALENT MANAGEMENT**



MOBILE SKILLS HOTTEST GROWTH (UP 11% THIS YEAR)

Enterprise architecture and business analysis skills in most demand (4 in 10 ClOs will hire these roles in 2013)

90% of CIOs are 'concerned' with retaining best talent

#### **INFLUENCE**

70% THINK ROLE OF CIO IS BECOMING MORE STRATEGIC, BUT

ONE IN FIVE CIOS (22%)
BELIEVE THEY HAVE 'LOST'
CONTROL OVER SOME
TECHNOLOGY ASSETS

CIOS RECOGNISE THAT 'INFLUENCE' AND 'CONTROL' ARE QUITE DIFFERENT THINGS (IN THE COLLABORATION AGE)

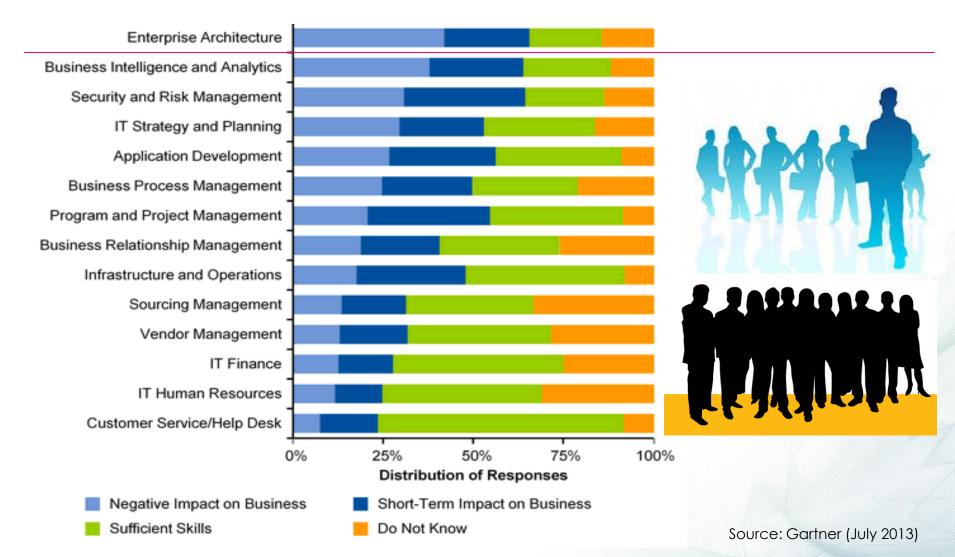
## HARVEY NASH CIO SURVEY 2013

Exhibit 2: % CIOs indicating skills shortages - broken down by technology skills

	2011	2012	2013	% change '11-'13
Big data	N/A	N/A	25%	N/A
Mobile solutions	14%	21%	25%	11%
Security and resilience	13%	17%	21%	8%
Social media	11%	15%	19%	8%
Technical architecture	28%	29%	35%	7%
Enterprise architecture	34%	35%	39%	5%
Business analysis	35%	34%	39%	4%
Service management	12%	12%	16%	<b>4</b> %
Development	19%	20%	22%	3%
Testing	17%	17%	20%	3%
Compliance	7%	8%	9%	2%
Business relationship management	21%	22%	22%	1%
Project management	30%	29%	31%	1%
Outsourcing	8%	8%	9%	1%
IT strategy	19%	20%	20%	1%
Change management	22%	20%	23%	1%
ERP	10%	11%	11%	1%

Gartner.

#### **Building the Talent to Hunt and Harvest**







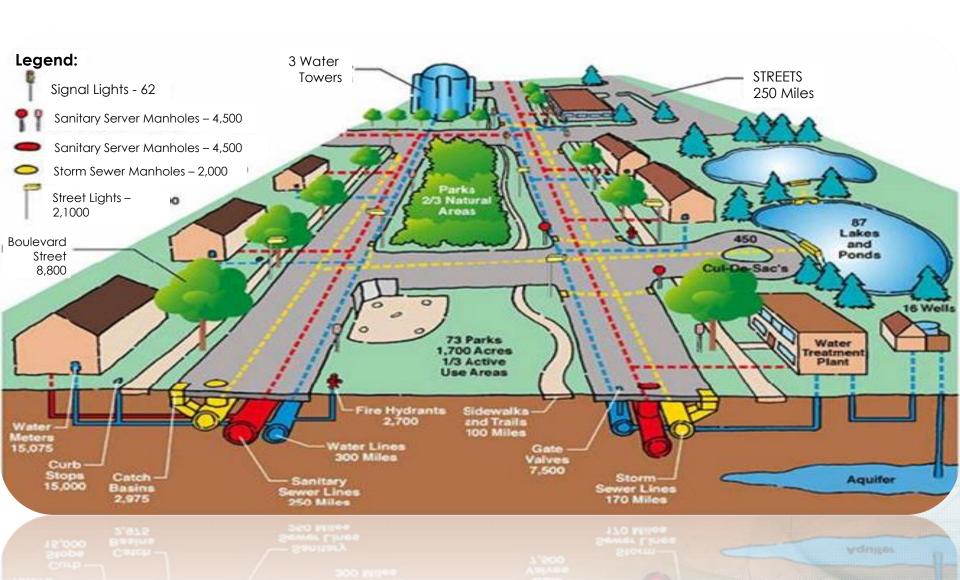
## 企業架構 (Enterprise Architecture)

#### 一個涵蓋業務及IT的全面性企業藍圖的整體規劃與設計方法

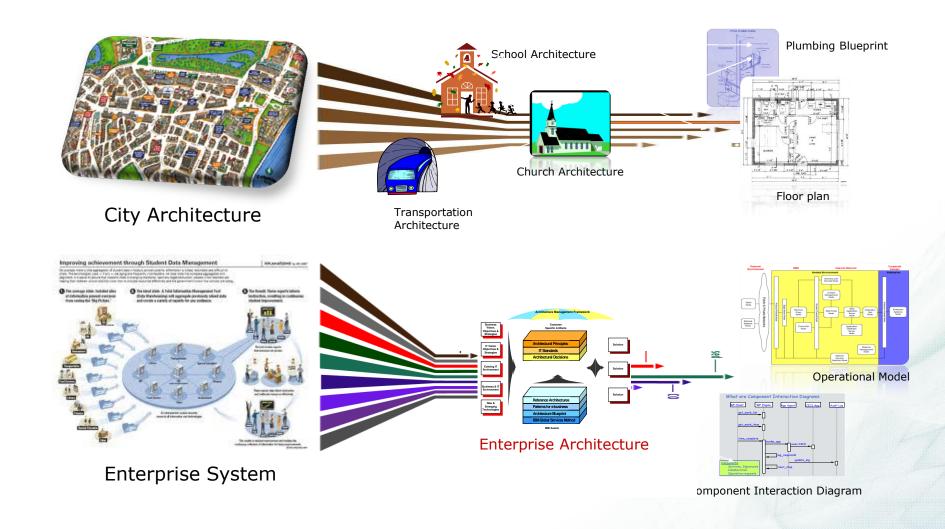
A framework of **planning method** for developing a **integrated blueprint** of business and IT systems and operation.

- ◆ 可以幫助企業建立一個全新的營運模式,對齊(alignment)企業策略
- ◆ 促進營運流程的再工程,提昇效能、降低成本、提高市場價值
- ◆ 協助企業分析現存問題,產生具全面性的改進方案及轉移方案
- ◆ 建立統合性的系統及營運的框架,以發展無縫的營運體系
- ◆ 提昇IT投資的回報、治理及健全系統化的效益及避免風險

## **CITY PLAN / Blueprint**



# IT Architectures are similar to the architectures we find in everyday life













How the customer explained it

How the Project Leader understood it

How the Analyst designed it

How the Programmer wrote it

How the Business Consultant described it



was documented







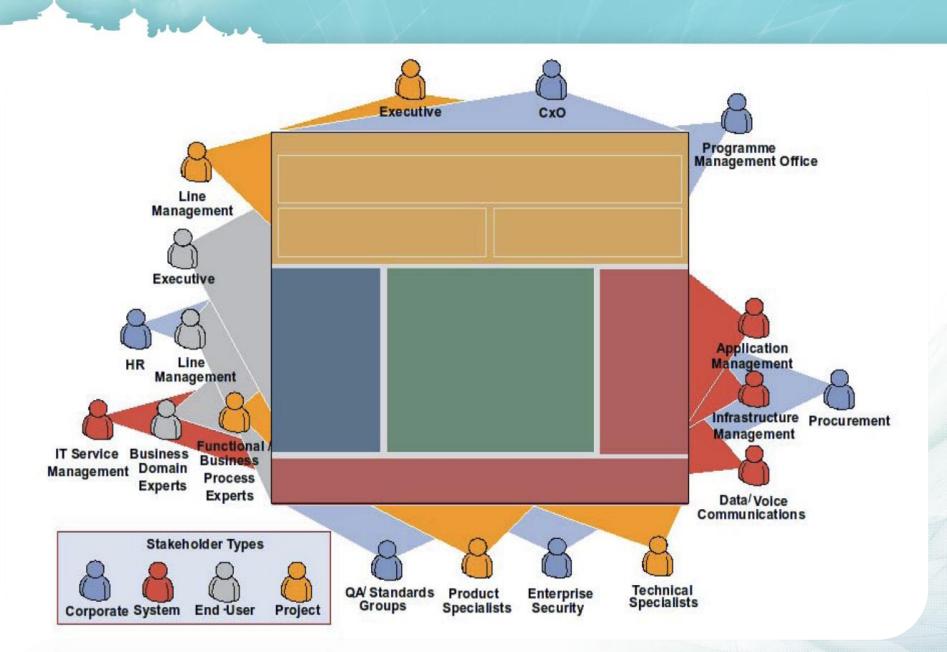


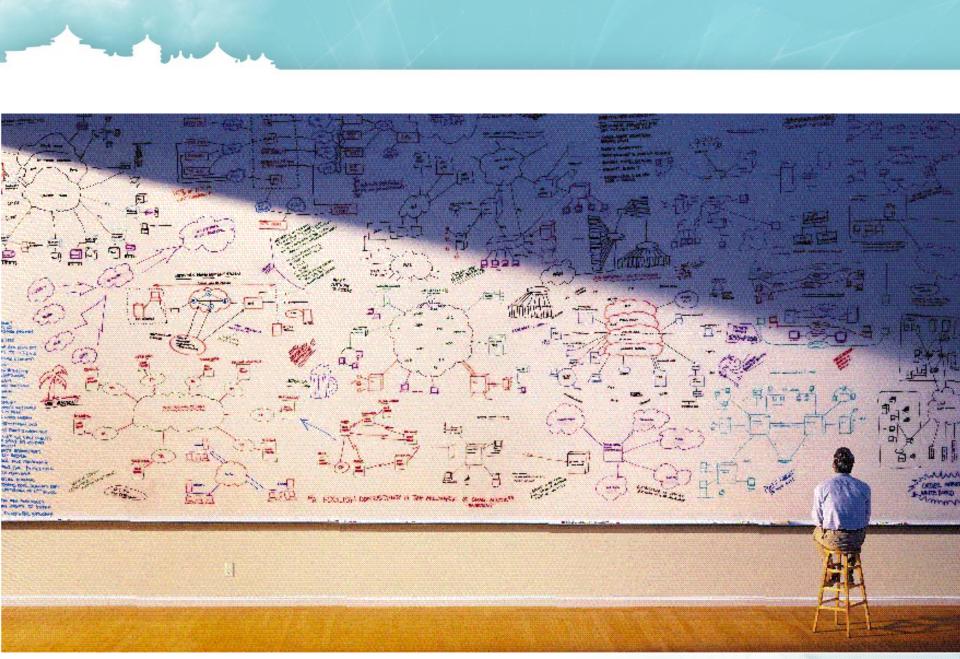
What operations installed

How the customer was billed

How it was supported

really needed





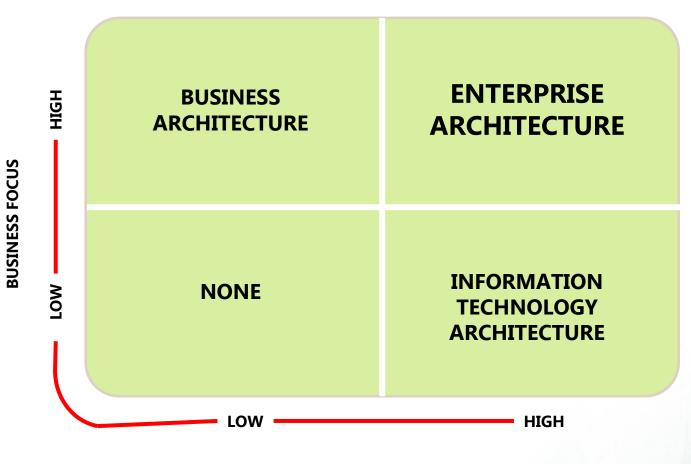
Source; IBM Global Services Method

## Enterprise Architecture Documentation: Current Practices and Future Directions

**Table 3.** Key EA challenges organizations are facing

Team Organization	n	% of all
Huge effort of data collection	77	55.00%
Bad quality of EA model data (actuality, consistency, completeness, etc.)	77	55.00%
Insufficient tool support	48	34.29%
No management support	44	33.43%
Low return on investment	36	25.71%
Other	32	22.86%
No specific challenge	10	7.14%

## Categories and Methods of ISP



**TECHNICAL FOCUS** 



## components



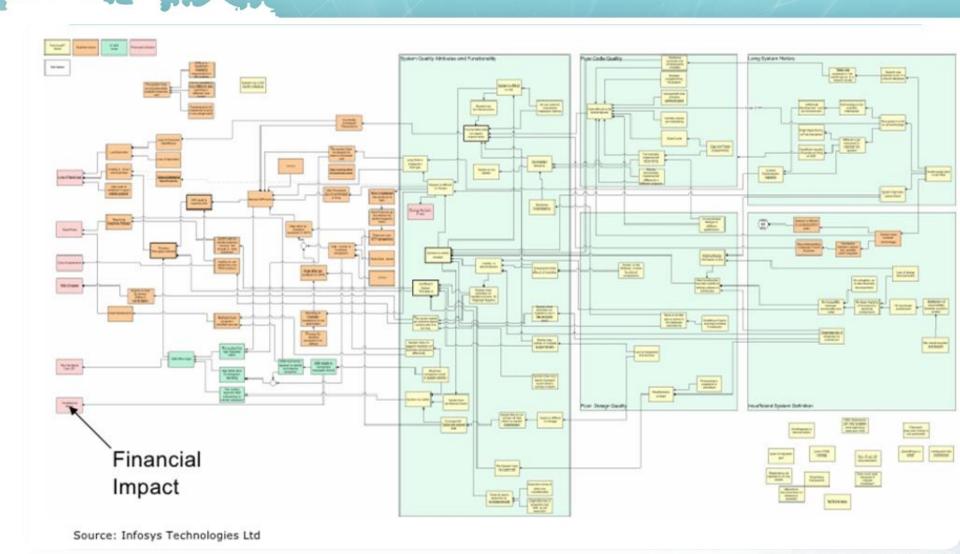


Architecture Type	Description
Business Architecture	The business strategy, governance, organization, and key business processes.
Data Architecture	The structure of an organization's logical and physical data assets and data management resources.
Application Architecture	A blueprint for the individual application systems to be deployed, their interactions, and their relationships to the core business processes of the organization.
Technology Architecture	The software and hardware capabilities that are required to support the deployment of business, data, and application services. This includes IT infrastructure, middleware, networks, communications, processing, and standards.

standards.

infrastructure, middleware, networks, communications, processing, and

## IT MODELING (SAMPLES)



Source: Infosys Technologies Ltd



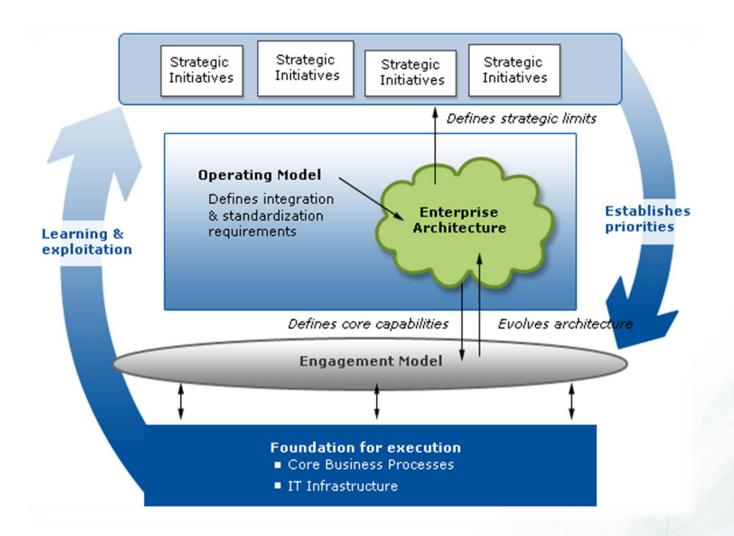
Enterprise Architecture: Strategic Role and Values

" By 2010, companies that have not <u>aligned their technology</u> with their business strategy will no longer be competitive in their industries (80% probability)."

## Gartner

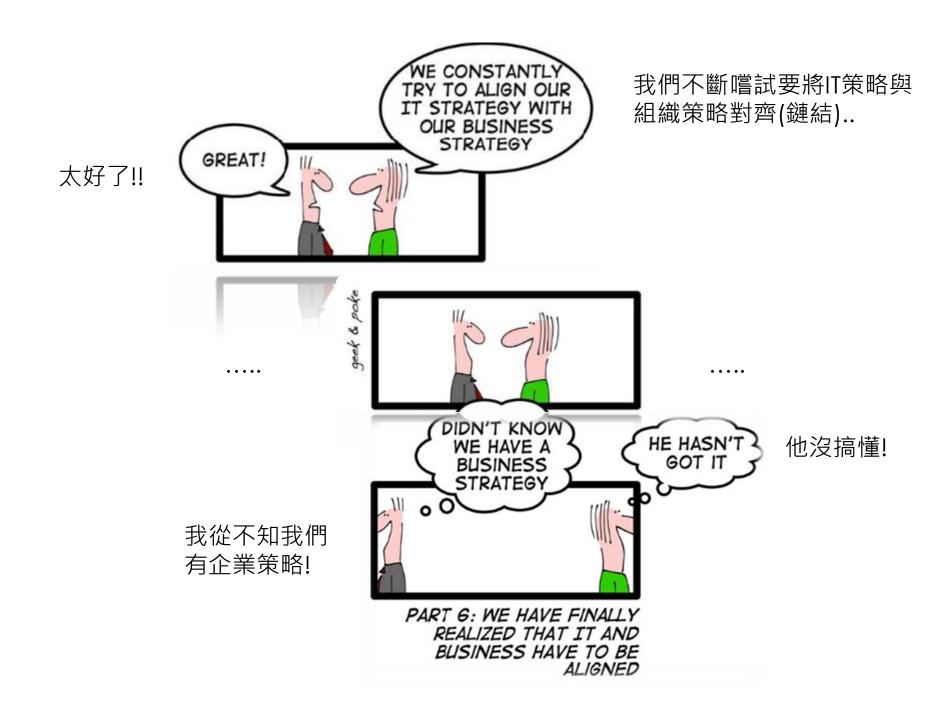
"An architecture is business-driven when it is derived from the business strategy. That means that you can show a clear cause-and-effect relationship between decisions about how technology will be used in the enterprise (the architecture) and some element of the business strategy."

## Enterprise Architecture as Strategy



### Core functions of EA







	Impacts	Top Recommendations
	Organizations look to grow and improve efficiency, creating new demands on EA.	<ul> <li>Adopt a business-outcome-driven approach, focusing on EA to execute business strategy and goals.</li> <li>Show CIOs how EA can support their priorities and expectations.</li> <li>Focus on outcomes, with a "just in time, just enough" approach.</li> </ul>
	CIOs must hunt and harvest digital opportunities.	<ul> <li>Use EA proactively as a way to identify tech innovations and opportunities.</li> <li>Develop business architecture to better represent strategy, goals and future-state capabilities.</li> <li>Engage business executives in EA, and build collaborative relationships.</li> </ul>
	New skills and approaches are needed to deliver business value.	Evolve EA maturity with competencies to support hunting and harvesting (such as business and information architecture).     Re-engineer EA processes/deliverables, and support rapid strategic experiments.     Work with CIOs to show how EA supports areas of increasing business participation.
Source: Gartner (	July 2013)	

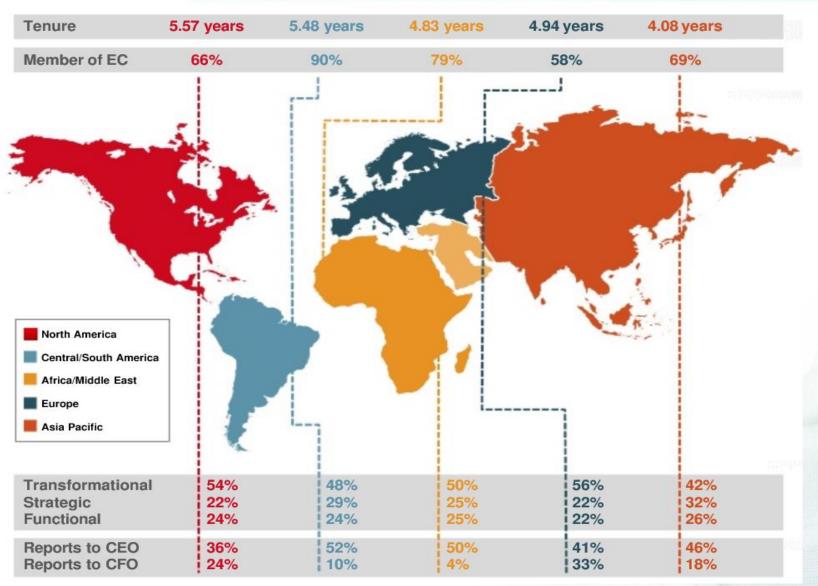
# CIO's Moving from Functional to Strategic

#### State of the CIO: 2012 Global Update

			2011		2012			3-5 yrs.
AL.	Aligning IT initiatives with business goals	1	58%	1	60%	t	4	38%
ATION	Implementing new systems and architecture	3	47%	3	49%	t	8	31%
ORM/	Cultivating the IT/business partnership	5	40%	4	43%	1	6	36%
TRANSFORMATIONAL	Leading change efforts	6	38%	6	38%		4	38%
TR/	Redesigning business processes	7	33%	8	27%	ļ	7	33%
	Improving IT operations/systems performance	2	53%	2	53%		11	24%
<b>IAL</b>	Cost control/expense management	4	45%	5	42%	ı	13	15%
FUNCTIONAL	Managing IT crises	8	26%	7	28%	t	15	5%
E S	Negotiating with IT vendors	8	26%	8	27%	1	14	10%
	Security management	11	22%	11	23%	t	12	16%
GIST	Driving business innovation	10	25%	10	26%	1	1	53%
STRATEGIST	Developing and refining business strategy	12	21%	12	22%	t	3	40%
	Identifying opportunities for competitive differentiation	13	17%	13	17%		2	43%
BUSINESS	Developing new go-to-market strategies & technologies	14	9%	14	12%	1	9	28%
BU	Studying market trends/customer needs to identify commercial opps.	14	9%	15	9%		10	27%

Source: State of the CIO Survey, CIO magazine, January 2012

# Strategic Role More Prevalent in Emerging Markets



Source: State of the CIO Survey, CIO magazine, January 2012



Communicating Values
of Enterprise Architecture
to Stakeholders

Many Factors Highlight the Value of EA

What Is IT Debt and How Is It Being Addressed?

Is Your IT Investment
Initiative Adding Value
to the Enterprise?



# Why do I need an enterprise architecture?

#### ◆ A more efficient business operation:

- Lower business operation costs
- More agile organization
- Business capabilities shared across the organization
- More flexible workforce
- Improved business productivity

#### A more efficient IT operation:

- Lower software development, support, and maintenance costs
- Improved interoperability and easier system and network management
- Improved ability to address critical enterprise-wide issues like security
- Easier upgrade and exchange of system components

#### Better return on existing investment, reduced risk for future investment:

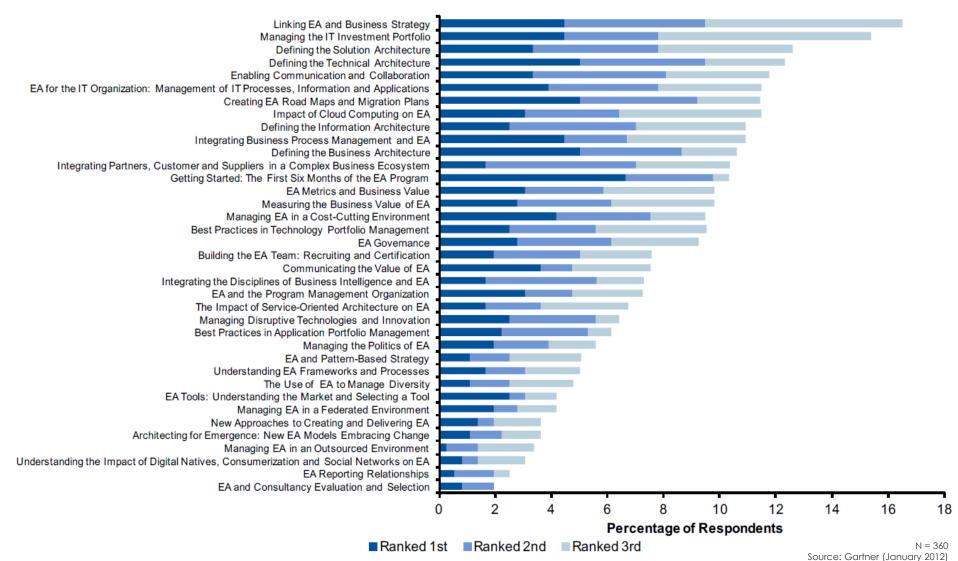
- Reduced complexity in the business and IT
- Maximum return on investment in existing business and IT infrastructure
- The flexibility to make, buy, or out-source business and IT solutions
- Reduced risk overall in new investments and their cost of ownership

#### Faster, simpler, and cheaper procurement:

- Buying decisions are simpler
- maximizing procurement speed
- The ability to procure heterogeneous, multi-vendor open systems
- The ability to secure more economic capabilities

#### Gartner's 2011 Global Enterprise Architecture Survey: EA Frameworks Are Still Homemade and Hybrid

#### Gartner Top Three Priorities for 2012-2013



### Regulatory Drivers for Adoption of EA

#### There are a number of laws and regulations that have been drivers for the adoption and use of enterprise architecture in business:

#### **The Clinger-Cohen Act**

(US Information Technology Management Reform Act 1996). The US Information Technology Management Reform Act (Clinger-Cohen Act) is designed to improve the way the US Federal Government acquires and manages IT. It mandates the use of a formal enterprise architecture process for all US federal agencies.

#### The Sarbanes-Oxley Act

(US Public Company Accounting Reform and Investor Protection Act 2002)
The Sarbanes-Oxley Act was passed in response to a number of major corporate and accounting scandals involving prominent companies in the US (for example, Enron and Worldcom). Under the Act, companies must provide attestation of internal control assessment, including documentation of control procedures related to IT.

#### **EU Directives on the Award of Public Contracts**

Similarly within the European Union, there are EU Directives that require vendors involved in Public Contracts to show that they are using formal enterprise architecture processes within their businesses when supplying products and services.

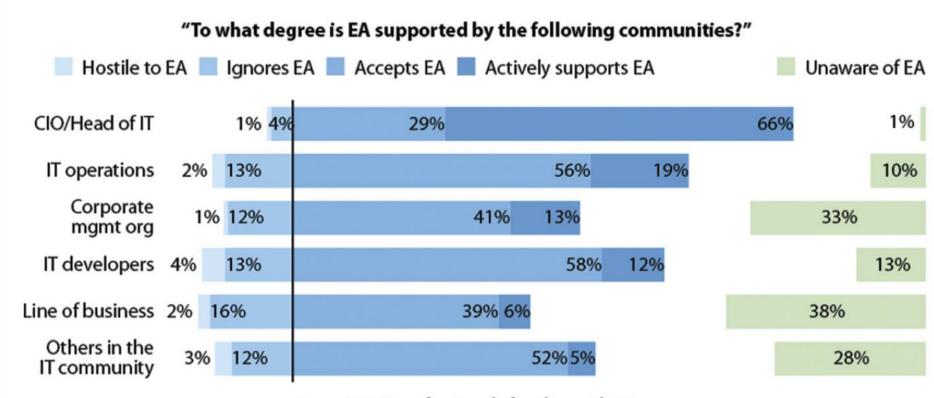


# Enterprise Architecture Global Overview



### EA專案的主要支持者的調查

**Figure 1:** Support for the EA program comes from IT & corporate business management

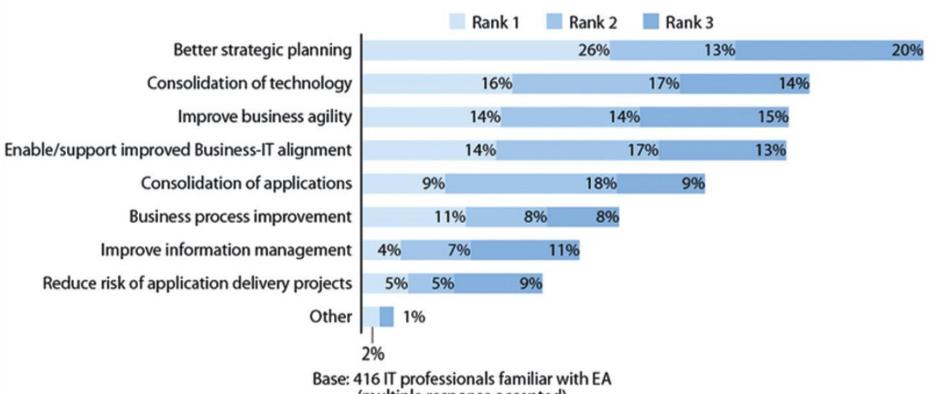


Base: 416 IT professionals familiar with EA (percentages may not add to 100 due to rounding)

## EA 專案的主要驅動力及動念之調查

Figure 2: Primary drivers for EA programs: better planning, consolidation, agility

#### "Rank the top 3 primary drivers for Enterprise Architecture within your organization."



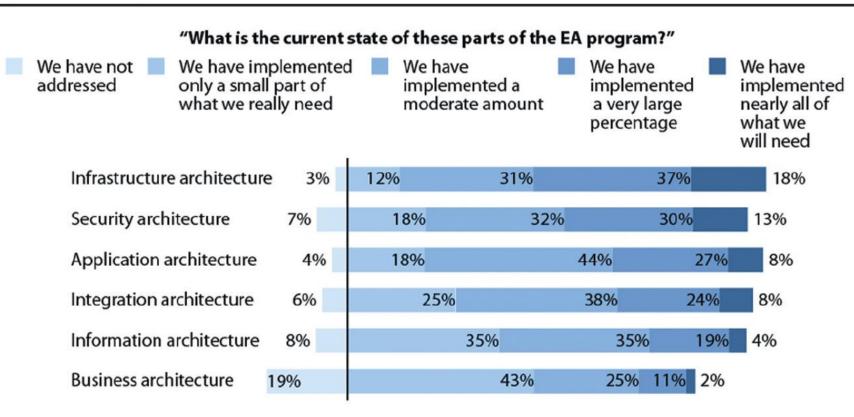
(multiple response accepted)

Source: September 2009 Global Annual State of Enterprise Architecture Online Survey, Forrester Research

Source: September 2009 Global Annual State of Enterprise Architecture Online Survey, Forrester Research

## EA專案中包含的架構的調查

**Figure 4:** Infrastructure & application architectures are the most complete, business is least



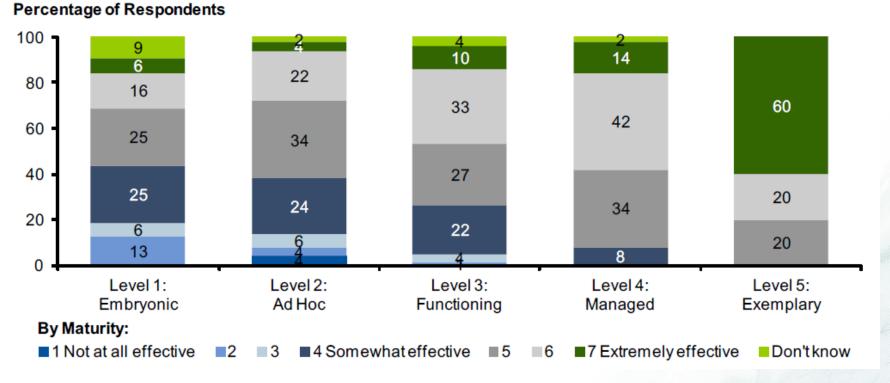
Base: 416 IT professionals familiar with EA (percentages may not add to 100 due to rounding, multiple responses accepted)

Source: September 2009 Global Annual State of Enterprise Architecture Online Survey, Forrester Research

#### Gartner's 2011 Global Enterprise Architecture Survey: EA Frameworks Are Still Homemade and Hybrid

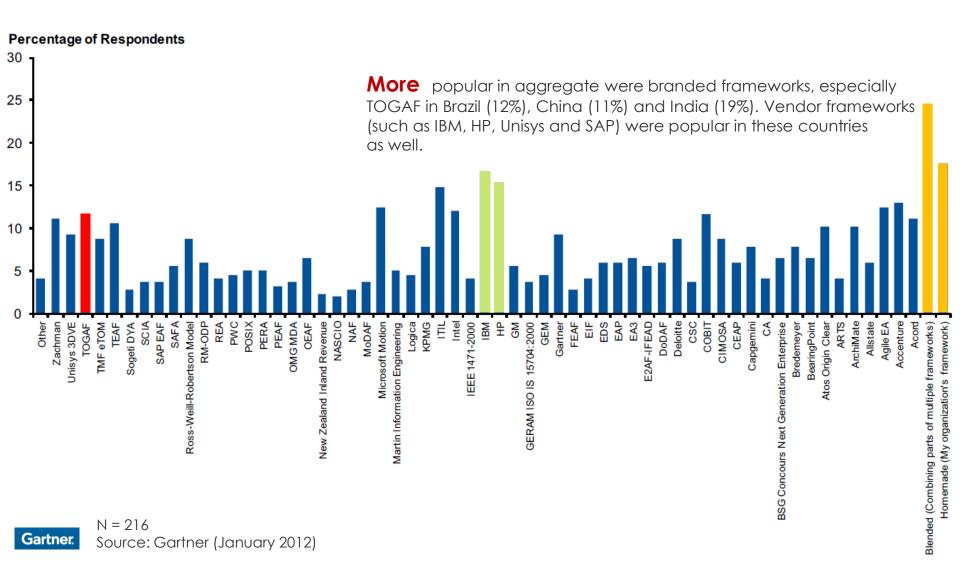
#### **Effectiveness of EA Framework**

#### Dama and and of Dama and and

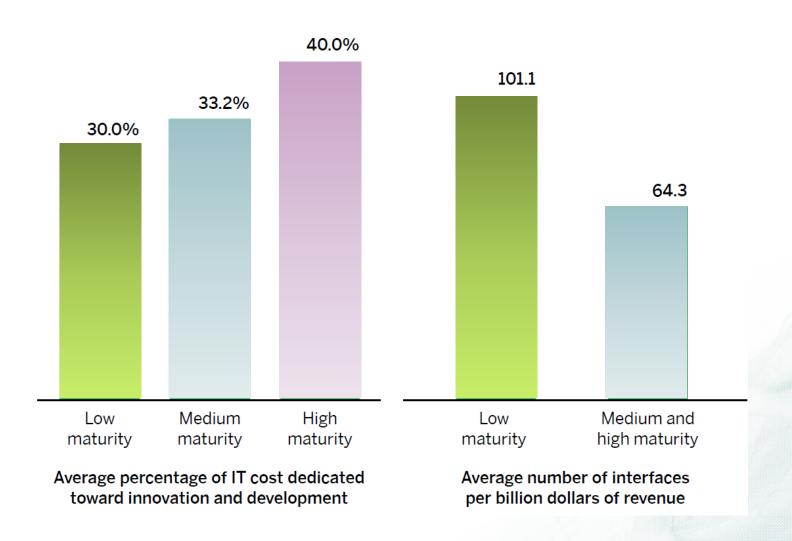


#### Gartner's 2011 Global Enterprise Architecture Survey: EA Frameworks Are Still Homemade and Hybrid

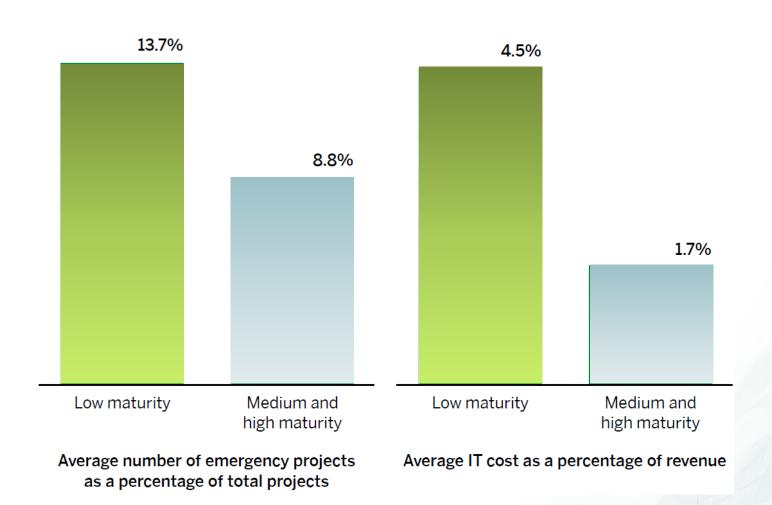
#### **EA Framework Currently Being Used**



Developing a Business Case and Road Map for Mature EA Practices to Maximize Value in IT Investments

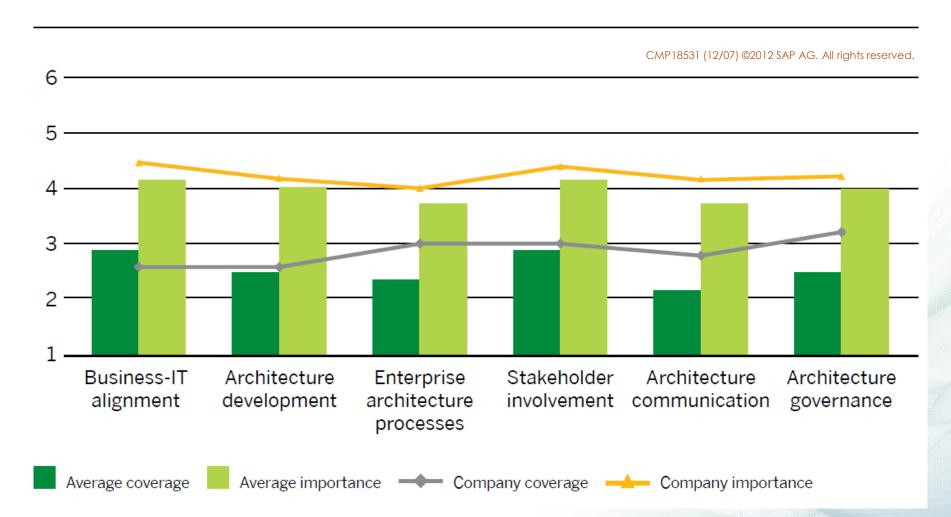


Developing a Business Case and Road Map for Mature EA Practices to Maximize Value in IT Investments



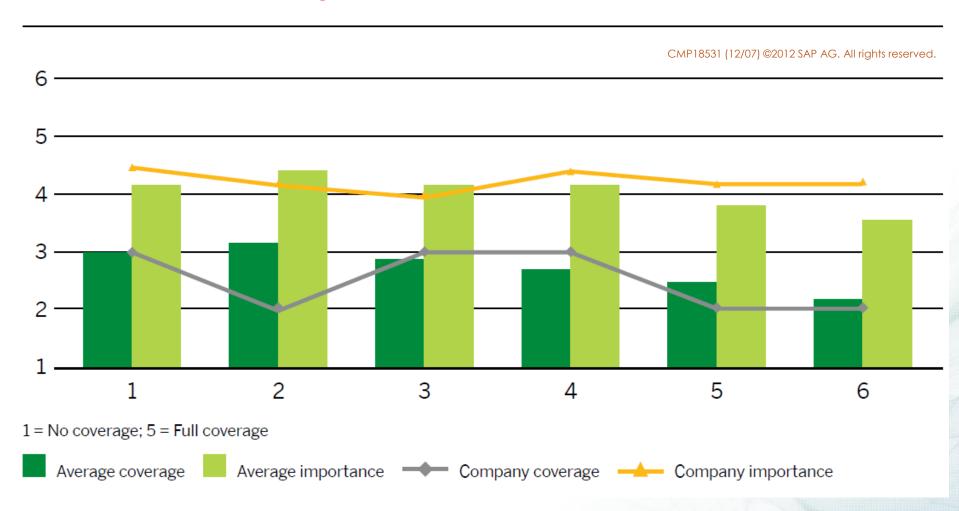
Developing a Business Case and Road Map for Mature EA Practices to Maximize Value in IT Investments

# Example of Average and Company-Specific Gaps in EA Best-Practice Maturity



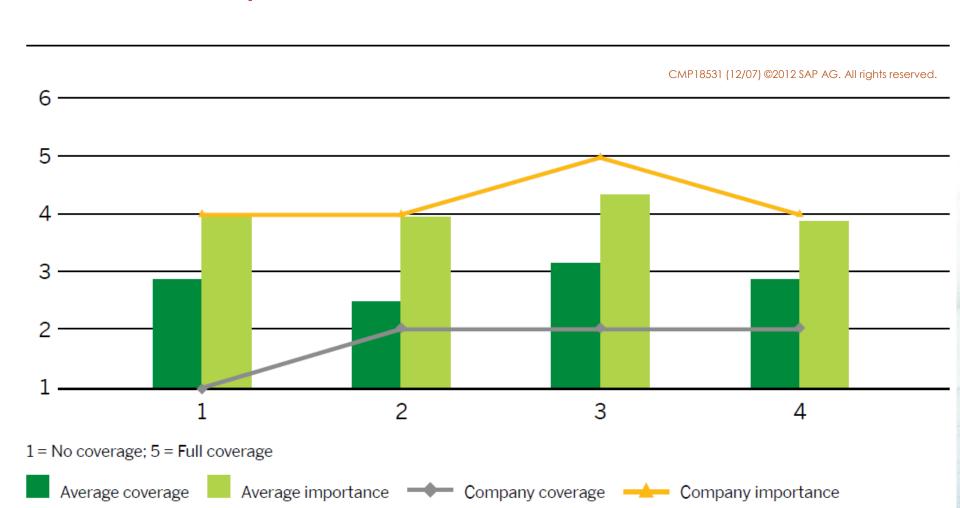
Developing a Business Case and Road Map for Mature EA Practices to Maximize Value in IT Investments

#### Best-Practice Gaps in Alignment of Business and IT



Developing a Business Case and Road Map for Mature EA Practices to Maximize Value in IT Investments

#### Best-Practice Gaps in EA Stakeholder Involvement





## **Key Findings**

- Globally, understanding EA frameworks and processes ranks roughly
   15th out of the 37 current priorities.
- Globally, 37% of organizations name "homemade" or "blended" as their primary framework.
- Globally, 89% of organizations rated their EA frameworks somewhat to extremely effective.

#### **Recommendations**

- Choose an EA framework, but which one isn't that important.
- Don't attempt to take a branded EA framework off the shelf and routinely apply it to your organization.
- Organically create EA artifacts based on the unique characteristics of your enterprise.

**Enterprise Architecture** 



# Core Concepts from...



-在60年代晚期, IBM的架構組負責人Dewey Walker 提出企業系統規劃 (Business Systems Planning -BSP).



- 80年代中期, Dewey Walker的學生John Zachman發表了一系列文章, 第一次提出以一個架構體系來聯結和整合企業系統. 他提出的體系被稱為 Zachman架構體系(Zachman Framework for Enterprise Architecture). 在以後的二十幾年裡, Zachman體系演變為今天的6x6結構

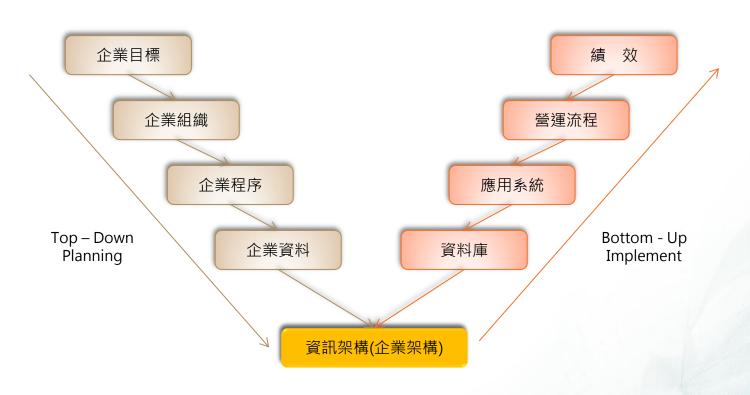


- Zachman的思路和體系啟迪了很多人和機構. 從八十年代晚期至今, 一系列架構體系被提出,包括美國政府和國際標準組織分別提出的若干 個.

## BSP Business Systems Planning (1975)

#### 基礎原則:

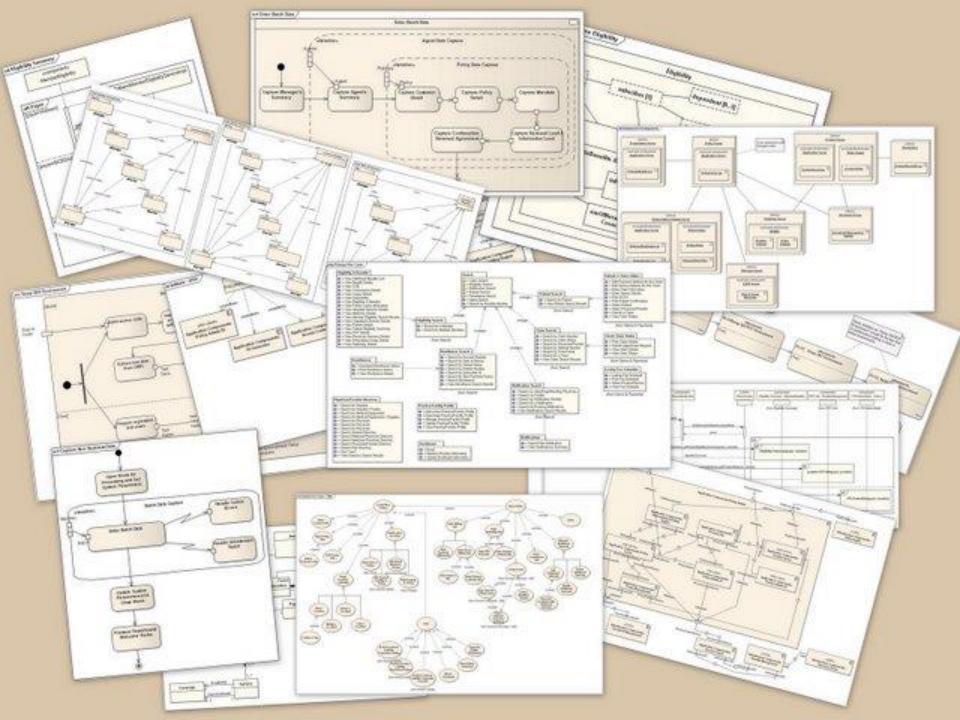
- 一·整體組織觀點的建立(Establishment of Organization-Wide Perspective)。
- 二·由上而下的規劃,由下而上的發展(Top-Down Planning, Bottom-Up Implement)
- 三·資料-組織和系統-組織的獨立性(Data-Organization & System-Organization Independence)



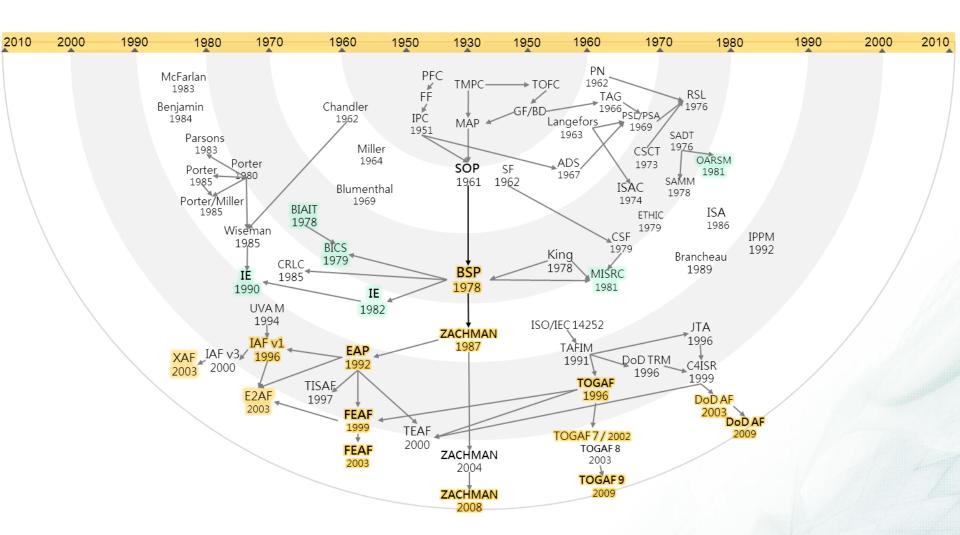
#### THE ZACHMAN ENTERPRISE FRAMEWORK<sup>2</sup> TM

	WHAT	How	WHERE	Wно	WHEN	WHY	
SCOPE	Inventory Identification  eq.  inventory Types	Process Identification	Network Identification	Organization Identification	Timing Identification	Motivation Identification	STRATEGISTS
Business	Inventory Definition  ***  ***  Business Entity  Business Relationship	Process Definition  e.g.  Business Transform Business Input	Network Definition  og  Business Location  Business Connection	Organization Definition  *9.  Business Role Business Work	Timing Definition  *9  Business Cycle Business Moment	Motivation Definition  eg.  Business End Business Means	EXECUTIVE LEADERS
System	Inventory Representation  og  System Entity System Relationship	Process Representation  eg  System Transform System Input	Network Representation	Organization Representation  es  System Role System Work	Timing Representation	Motivation Representation  **#  System End System Means	Architects
TECHNOLOGY	Inventory Specification  og  Technology Entity Technology Relationship	Process Specification	Network Specification  og  Technology Location Technology Connection	Organization Specification  eg  Technology Role Technology Work	Timing Specification  eg  Technology Cycle Technology Moment	Motivation Specification  og  Technology End Technology Means	Engineers
COMPONENT	Inventory Configuration  *g  Component Entity Component Relationship	Process Configuration  eg  Component Transform Component Input	Network Configuration	Organization Configuration	Timing Configuration  **9  Component Cycle Component Moment	Motivation Configuration  *9  Component End Component Means	TECHNICIANS
OPERATIONS	Operations Entity Operations Relationship	Operations Transform Operations Input	Operations Connection	Organization Instantiation	Operations Cycle	Motivation Instantiation  e.g.  Operations End Operations Means	Workers
Released October 2007	INVENTORY	Process	NETWORK	ORGANIZATION	TIMING	MOTIVATION	Version 2.01
	The second secon	The second secon	A CONTRACTOR OF THE PARTY OF TH	The same and the s	Contract the second contract to the second co	COMMAND CONTRACTOR	

© 1987 John A. Zachman; hexagon model © 1998 Zachman Framework Associates; derivative work © 2002 Zachman Framework Associates; metamodel projection © 2008 Stan Locke; ontology synopsis © 2008 John A. Zachman. 2008 Commercial Presentation License 031097 issued to John P Zachman. All Rights Reserved. Please do not reproduce.



## **Historical Review of Enterprise Architecture**



Source: Hsin-Ke Lu

## 主要的企業架構框架及方法



- ☐ FEAF: Federal Enterprise Architecture Framework
- Zachman Framework
- **□** DoDAF: DoD Architecture Framework
- ☐ TOGAF: The Open Group Architecture Framework

# FEA

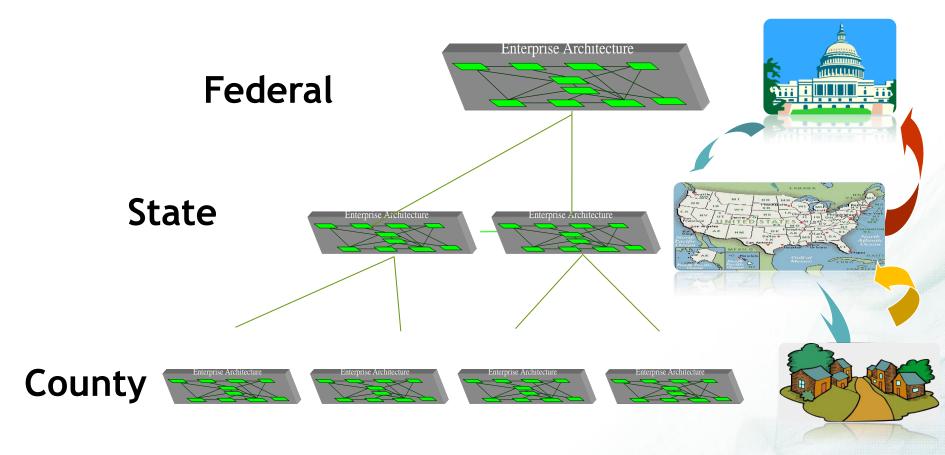
Federal Enterprise Architecture

聯邦企業架構



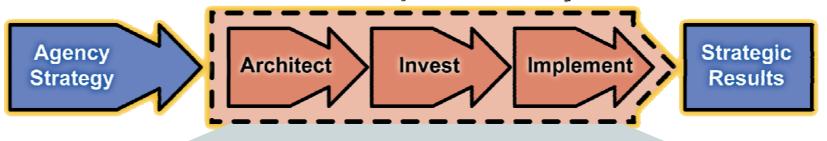
## Inter - Enterprise Architecture

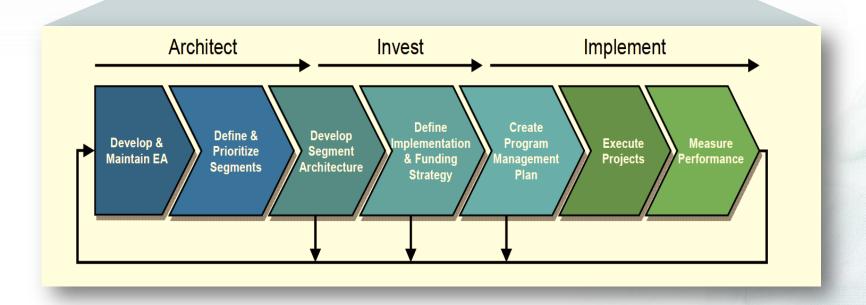
managing inter-enterprise operability



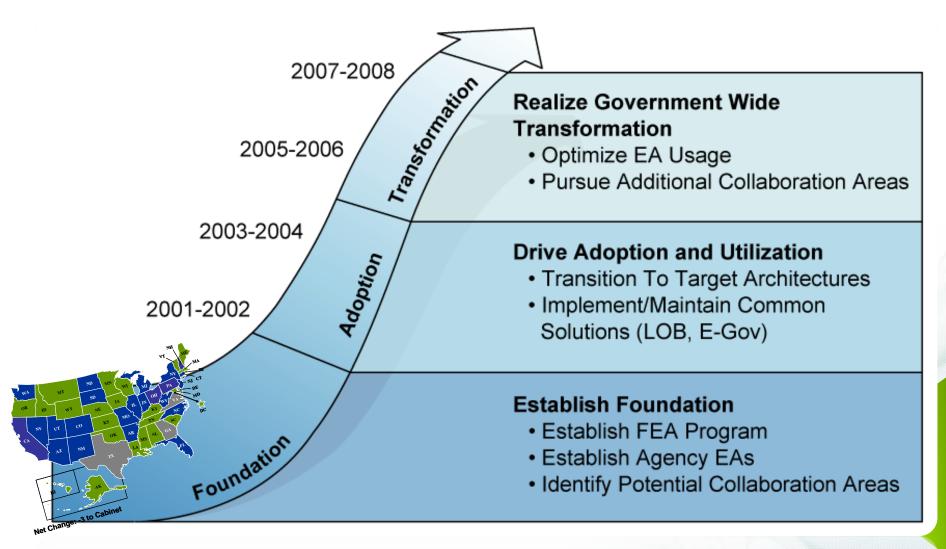
## Performance Improvement Lifecycle

#### Performance Improvement Lifecycle





## Direction for the states



# TOGAF

The Open Group Architecture Framework 開放組織(企業)架構框架

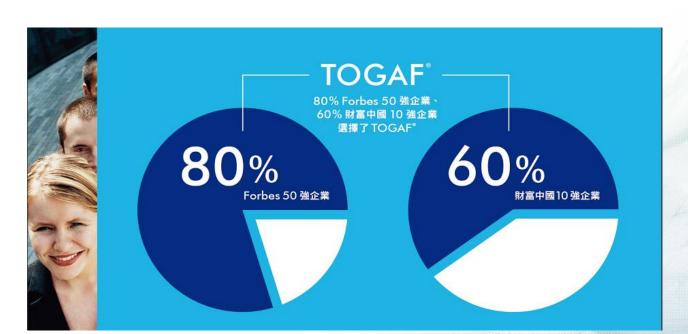


#### TOGAF<sup>®</sup>企業架構框架概述

TOGAF®(The Open Group Architecture Framework,開放群組企業架構框架),是一個被世界領先組織廣泛應用,並得到實務驗證的資訊整體規劃方法和框架,用以建立企業架構、優化管理流程和制度、綜合營運的系統化設計,進而為 戰略、業務架構、IT的整體規劃提供基礎框架及策略藍圖。

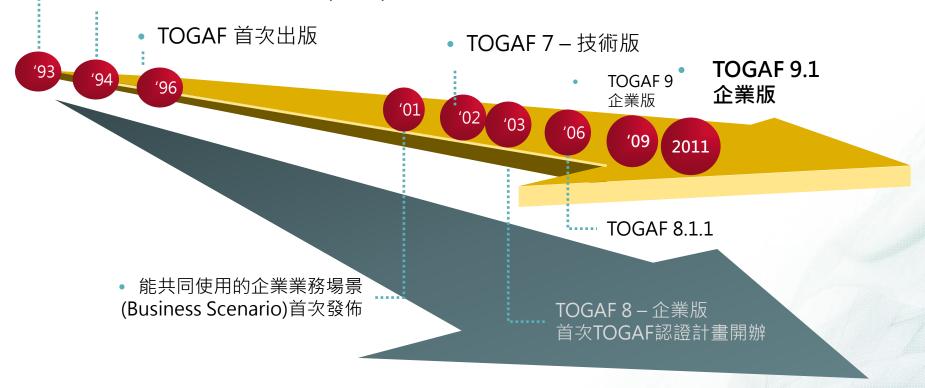
#### TOGAF®成為國際廣泛支持的通用標準

TOGAF®目前已被廣泛運用於世界 500 強企業,80% 的 Forbes 50 強企業以及 60% 的財富中國 10 強企業皆支持與採用。同時獲到 HP、IBM、Kingdee、ORACLE、SAP 等國際知名企業的高度認同。Open Goup 為開放性標準倡導組織,因而其 TOGAF® 廣泛受到全球企業架構專業社群的支持,成為企業架構師專業認證的國際標準之一。

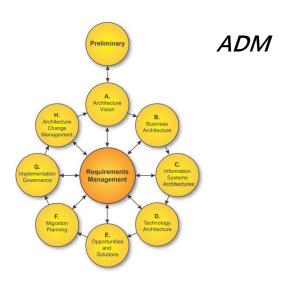


## 會員驅動的開放性演進

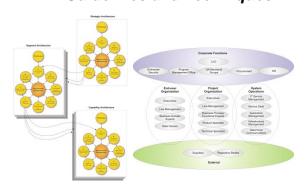
- ▶ 客戶會員要求架構標準...
  - 客戶會員選擇 TAFIM 為優先出發點...
  - 美國國防部資訊系統局(DISA)捐贈 TAFIM作為基礎



## TOGAF 9 components



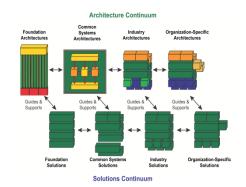
ADM 指引和技術 ADM Guidelines and Techniques



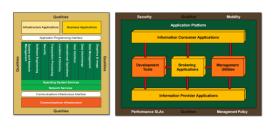
架構 內容 框架 Architecture Content Framework



企業連續系列 The Enterprise Continuum



*參考模型* TOGAF Reference Models



架構能力框架 Architecture Capability Framework

