# *Enterprise IT Architectures*

# Enterprise Architecture (EA)

# Agenda of this Session

- **Problem Statements**
  - **Where are holistic approaches necessary**

- **Enterprise Architecture Introduction**
  - **"Doing the right things right"**

- **Enterprise Architecture Methodology**
  - **Almost the same as IT Solutions Architecture**

**Part 1 – EA**

- **Capabilities**
  - **Alignment Business and IT through Business Capabilities**

**Problem Statements requiring
Holistic Views**

## *Problem Statement 1*: "Not enough Budget for all Projects"

- *Planning for next year*: **List of all projects is double the budget**
    - **Everybody has put his wishes into the "project list"**
    - **Budget is defined by the capabilities of the enterprise**
    - **How to take decisions ?**

| Dept. | Whats Up | Costs |
|-------|----------|-------|
| IT | Maintenance DB | 100K |
| IT | Project Internet | 250K |
| Sales | Sales Statistics | 50K |
| Mgmt | BI | 300K |

**Total: 4.300K**

**Budget: 2.000K**

**?**
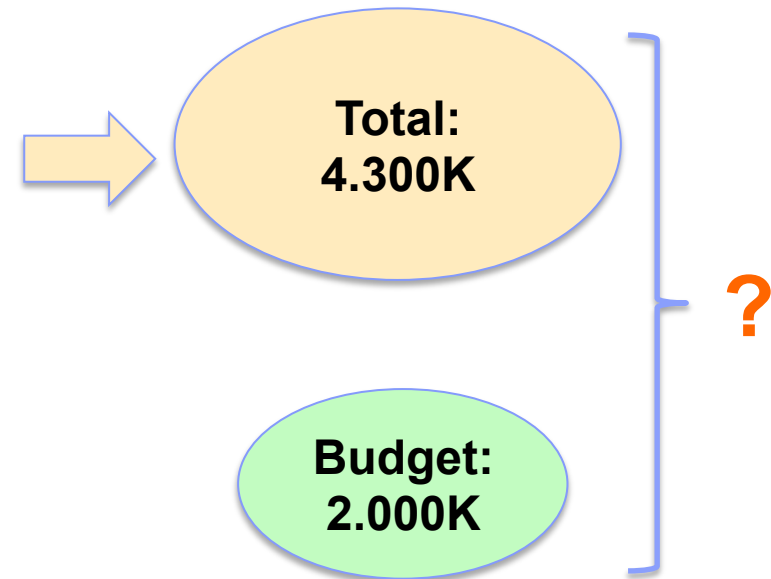
## *Problem Statement 2*: "IT Strategy" (Often a 5 year view – separates "run the business" and "new")

- *Strategic Investments*: **In what should we invest from a Strategic Perspective**
  - **Improvement of Capabilities (including the evaluation of the quality)**
  - **Costs (Long Term) versus Impact**

| Whats Up | Impact |
|---|---|
| Replacement xyz | Security Improvement |
| Cloud | Cost Reduction |
| Social Media | Customer Awareness |
| BI | ? |

**?**

## *Problem Statement 3*: "Cloud Computing" ("should we use Cloud Computing and how")

- *Cloud Computing* benefits:
  - On demand – available immediately
  - Scalable – adaptable to load

- How to proceed?
  - Iaas, Paas, SaaS ?
  - Private, public, hybrid, starting with what ?
  - Security issues – where is data stored ?
  - Control about infrastructure ?
  - Required changes (e.g. network capabilities) ?
  - Cost structure (out of the pocket versus Investment)

**?**

## *Problem Statement 4*: "Portfolio Management" "Which tools do we have ?"

- *Various Portfolios*: Application, Technology, Project, Services (SOA)
  - What is the impact of a change or a new release (e.g. operating system) – there was once the 2000 year issue !
  - Building up of a "Repository" (including Role/System-Matrix, System/Data-Matrix, Application Interaction Matrix, …)
  - One of the major reasons for *EAM (Enterprise Architecture Management)* ?

| Dept. | Whats Up | Seats |
|-------|----------|-------|
| All | Word | 300 |
| All | Visio | 100 |
| IT | Development Tool Suite | 25 |
| Mgmt | Finance Feed | 10 |

**New Releases**

**?**

*Problem Statement 5*: "Business IT Alignment"
(90% of our stakeholders have no Architecture knowledge)

- **Rapidly Changing Business Environments as well as IT Technology:**
  - **Impact of various Technology Trends (Cloud, IoT, …)**
  - **Buzzwords: „Adaptive Enterprise" and „Agile Architecture"**
- *Good Practices*:
  - **Combining Vision statements as well as short term successes**
  - **Value for the Business (also short term), not just Cost Reduction**
  - **Use of appropriate terms: Business Capabilities, Business Processes, Business Services**

| Who | What |
|-----|------|
| Sales | 360 Customer View |
| Sales | Support of Process xyz |
| Accounting | Customer Awareness |
| Management | ? |

**?**

**Enterprise Architecture – Purpose**

# Why EA – "Enterprise Architecture"

- *EA is helping enterprises to do the right things right*

- **EA is a *holistic* approach to the control and co-ordination of IT based business projects**

- **Enterprise Architects with a sense of what the enterprise needs to be and do, and how IT should be used in a wider sense**

- **Avoiding results like:**

# Winchester Mystery House Syndrome
## (Pictures show blind windows, stairs ending at a wall or at the ceiling, etc.)

Yesterday's management approaches are not working in today's complex and fast-paced environment.
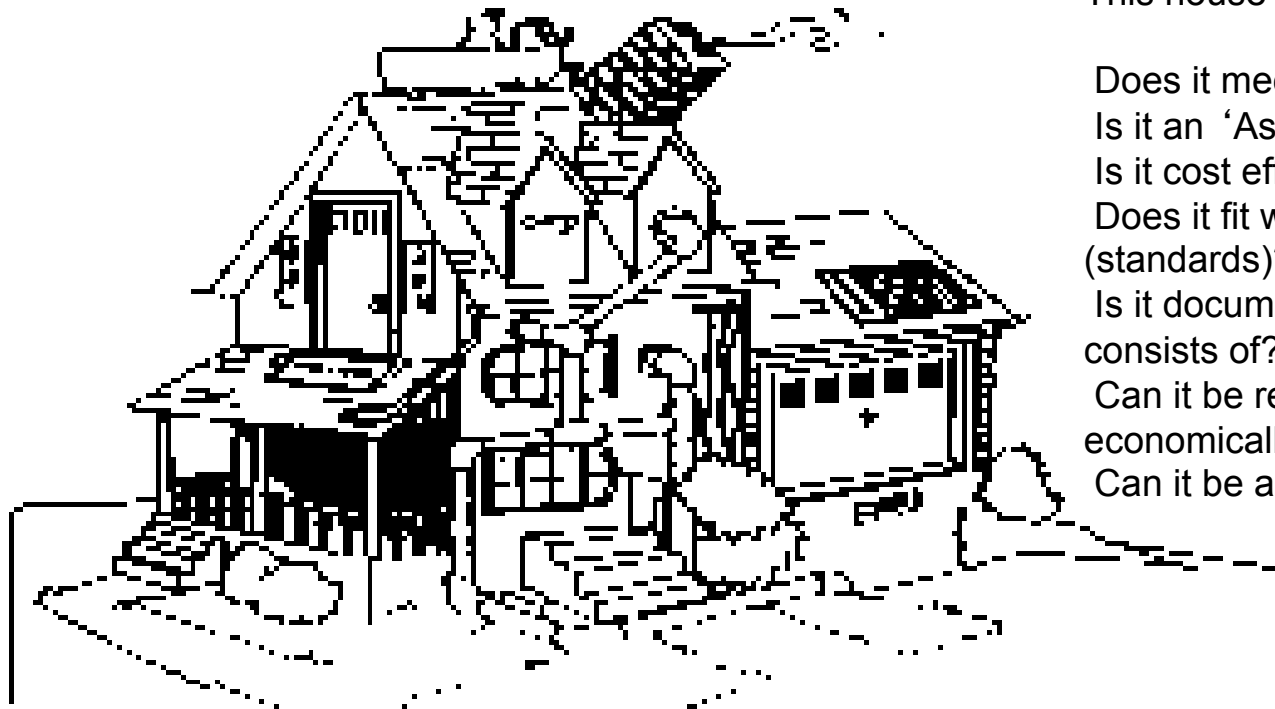
This house may function, but…

Does it meet business objectives?
Is it an 'Asset Junkyard'?
Is it cost effective?
Does it fit with the community (standards)?
Is it documented - who knows what it consists of?
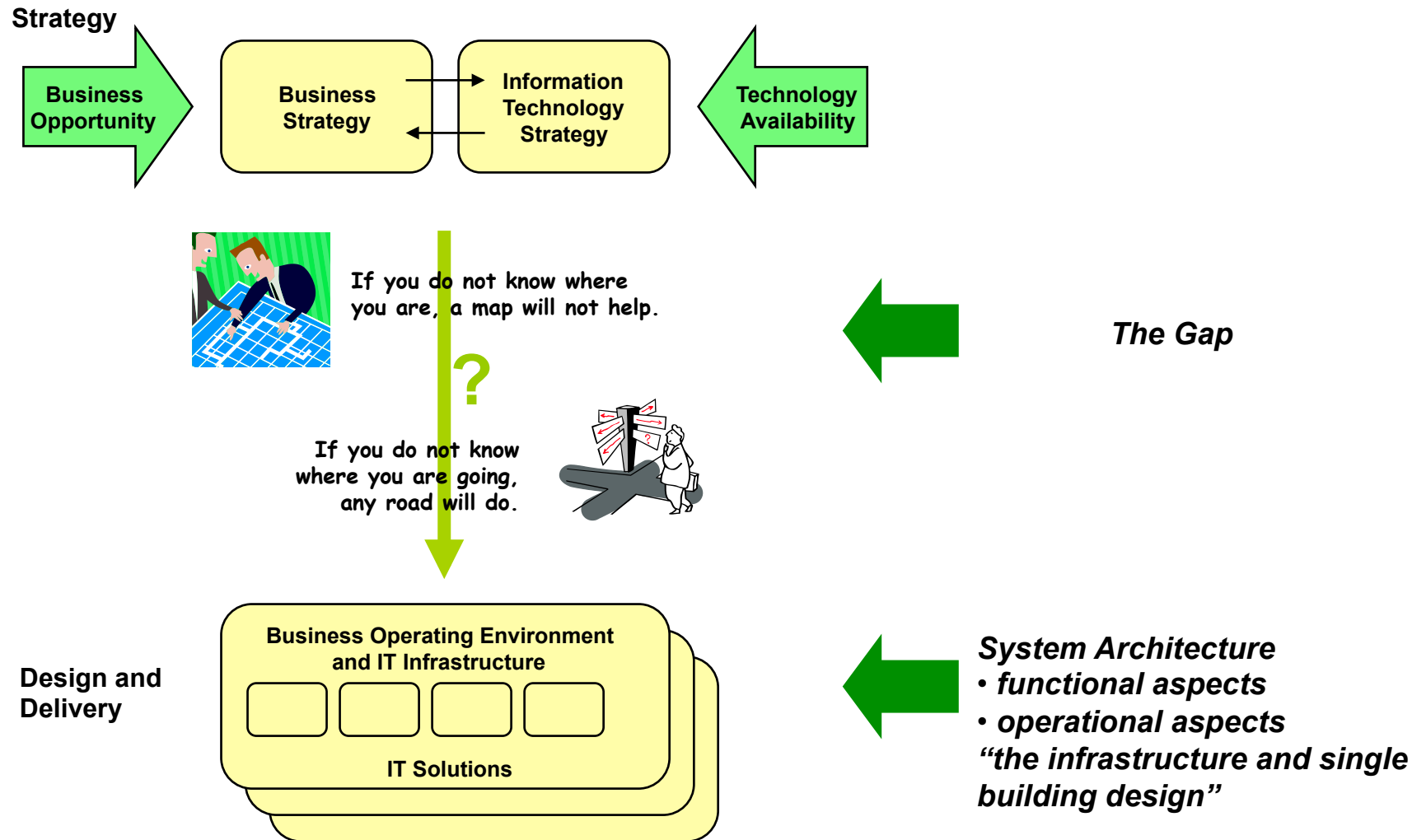Can it be repaired easily or economically?
Can it be adapted to changing needs?

**'If you don't know where you're going, any road will get you there.'**
*Lewis Carroll*

# It can be a challenge to ensure IT based business solutions implement the business strategy…

**Strategy**

**Business Opportunity** → **Business Strategy** ⇄ **Information Technology Strategy** ← **Technology Availability**

If you do not know where you are, a map will not help.

**?**

If you do not know where you are going, any road will do.

← **The Gap**

**Design and Delivery**

**Business Operating Environment and IT Infrastructure**

**IT Solutions**

← *System Architecture*
- *functional aspects*
- *operational aspects*
*"the infrastructure and single building design"*

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Source: IBM

# Enterprise Architecture provides the vital linkages between "strategy" and "implementation"



**Strategy**

Business Opportunity

Business Strategy

Information Technology Strategy

Technology Availability

**Enterprise wide focus**

**Planning**

EA tells the organization where they are on the map

!!

EA identifies where the organization wants to be and how to get there

*Enterprise Architecture*

**Project focus**

**Design and Delivery**

Business Operating Environment and IT Infrastructure

IT Solutions

*System Architecture*
- *functional aspects*
- *operational aspects*
*"the infrastructure and single building design"*

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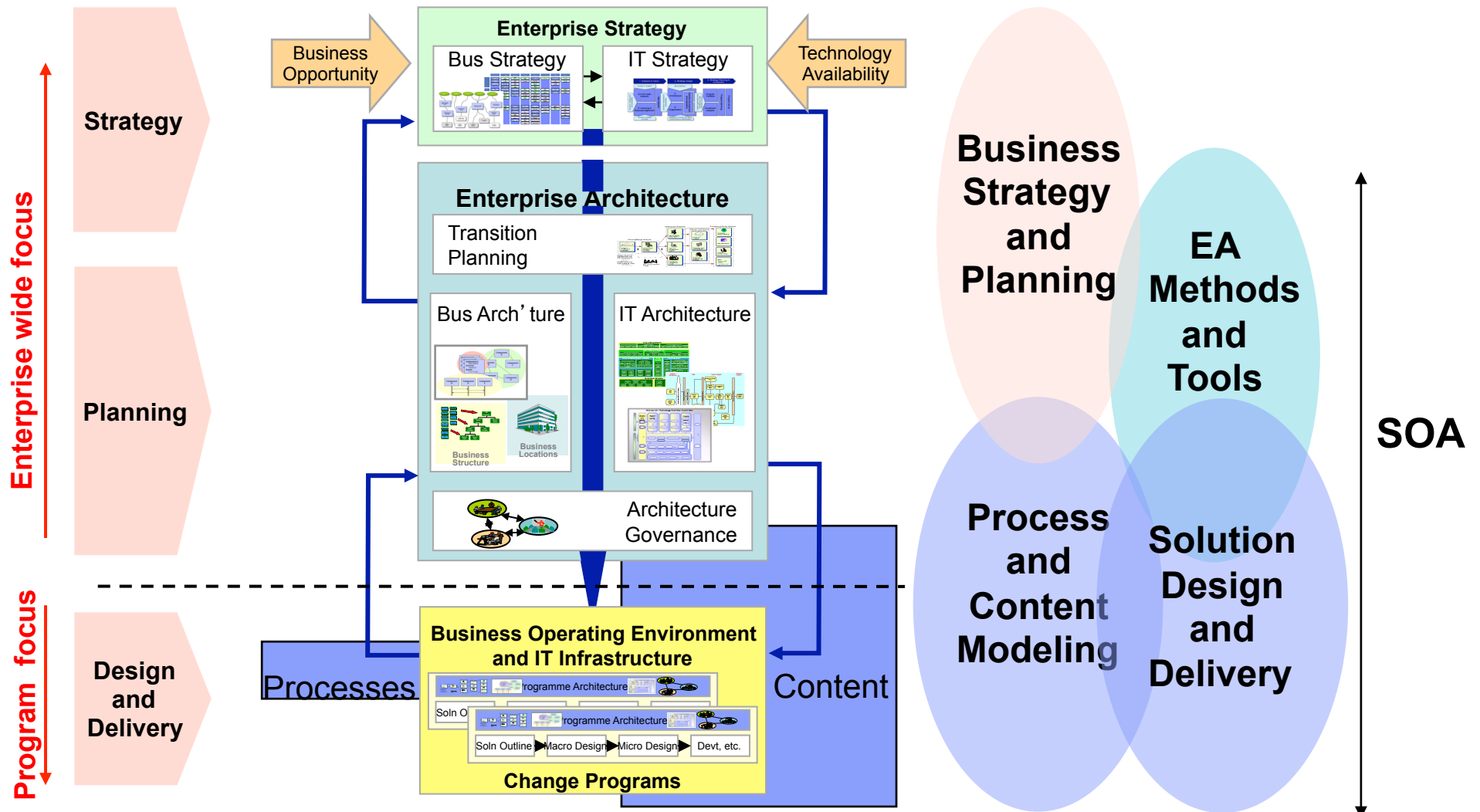Source: IBM

# Enterprise Architecture embraces both Business and IT Architectures, providing the "city plan" for "building projects"

**Strategy**

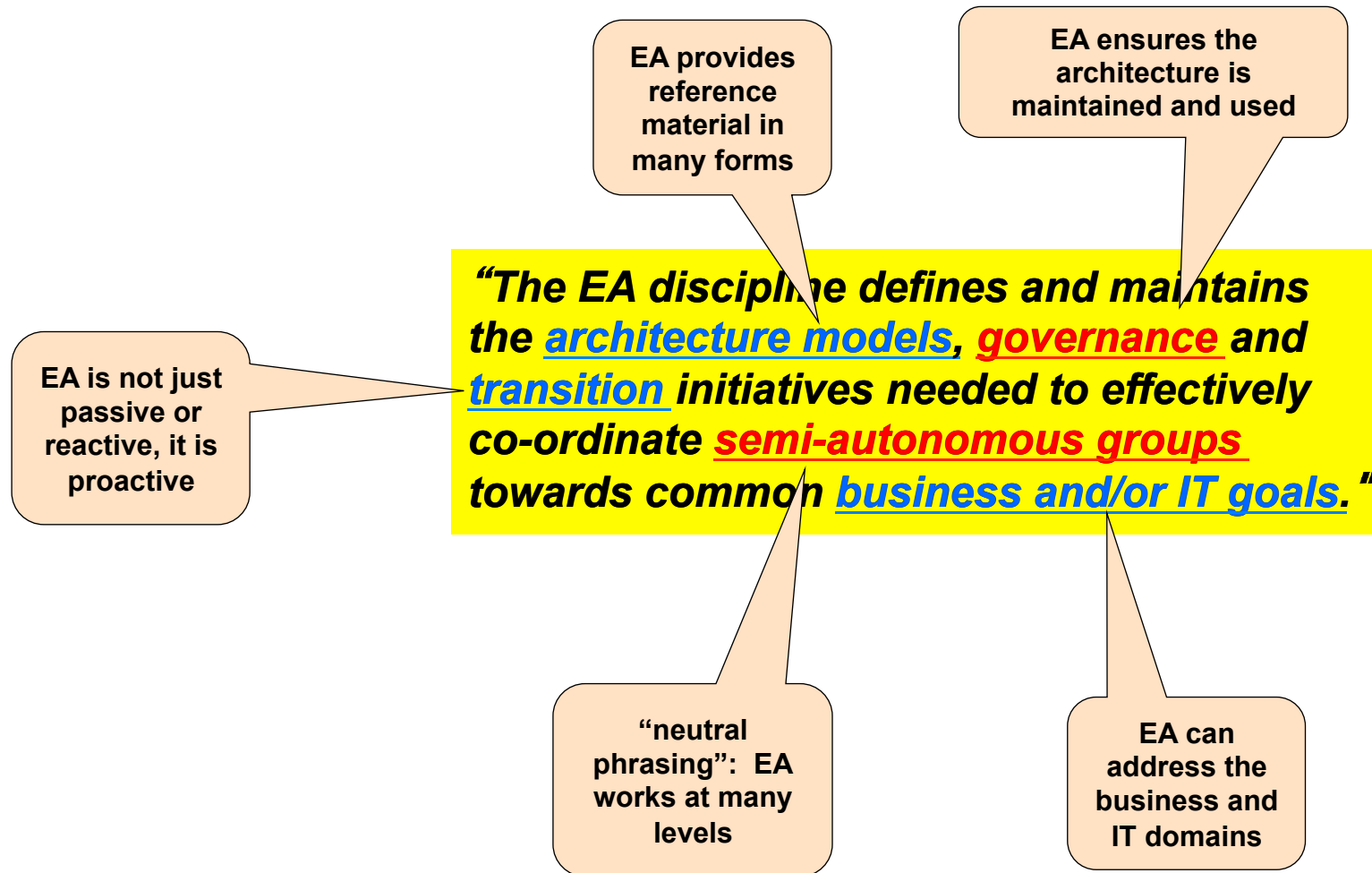**Enterprise wide focus**

**Project focus**

**Business Opportunity**

**Business Strategy**

**Information Technology Strategy**

**Technology Availability**

**Planning**

**Enterprise Architecture**

**Business Architecture**
- Processes
- Information
- People
- Locations

**IT Architecture**
- Applications
- Data
- Technology

**Transition Plan**

**Design and Delivery**

**Business Operating Environment and IT Infrastructure**

**IT Solutions**

*Enterprise Architecture "the city plan"*

*System Architecture "the building design"*

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Source: IBM

# Bridging the Gap Between Strategy and Delivery



**Enterprise wide focus**

**Strategy**

**Planning**

**Program focus**

**Design and Delivery**

Business Opportunity

Technology Availability

**Enterprise Strategy**
- Bus Strategy
- IT Strategy

**Enterprise Architecture**
- Transition Planning
- Bus Arch'ture
  - Business Structure
  - Business Locations
- IT Architecture
- Architecture Governance

**Business Operating Environment and IT Infrastructure**
- Programme Architecture
- Soln Outline ▸ Macro Design ▸ Micro Design ▸ Devt, etc.
- **Change Programs**

Processes

Content

**Business Strategy and Planning**

**EA Methods and Tools**

**Process and Content Modeling**

**Solution Design and Delivery**

**SOA**

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Source: IBM

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## *Enterprise Architecture*: defines the building blocks needed to underpin the portfolio of programs

EA provides reference material in many forms

EA ensures the architecture is maintained and used

EA is not just passive or reactive, it is proactive

*"The EA discipline defines and maintains the architecture models, governance and transition initiatives needed to effectively co-ordinate semi-autonomous groups towards common business and/or IT goals."*

"neutral phrasing": EA works at many levels

EA can address the business and IT domains

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Source: IBM

# Enterprise Architecture (EA) should reduce the increasing complexity across the enterprise

Source: Zühlke Engineering
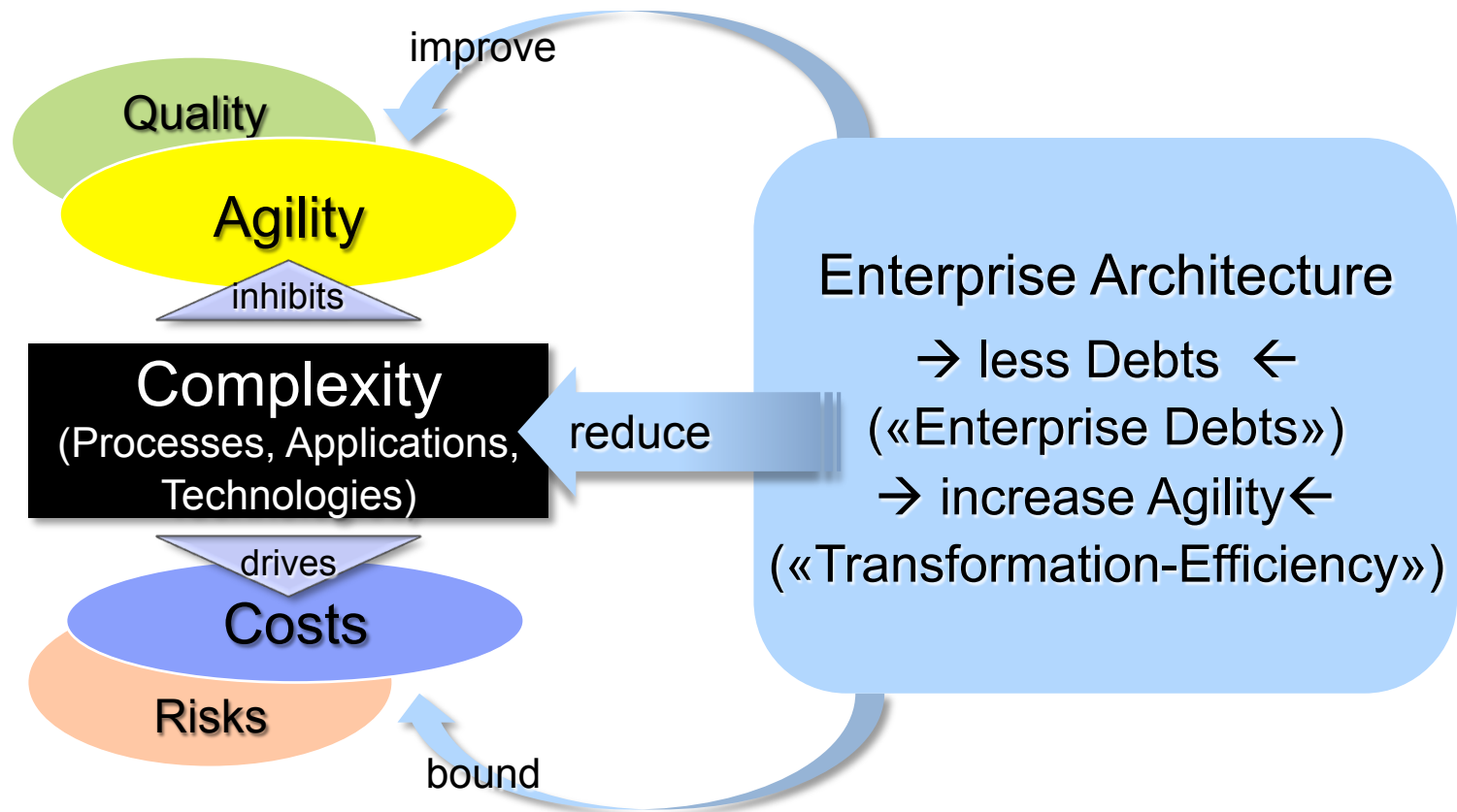
# Three aspects to implementing an Enterprise Architecture



■**Models**

■**Principles**

■**Enterprise Tech Framework**

■**Transition Plan**

■**Management Action Plan**

■**Organisation**

■**Processes**

■**Evaluation & Selection**

Source: IBM
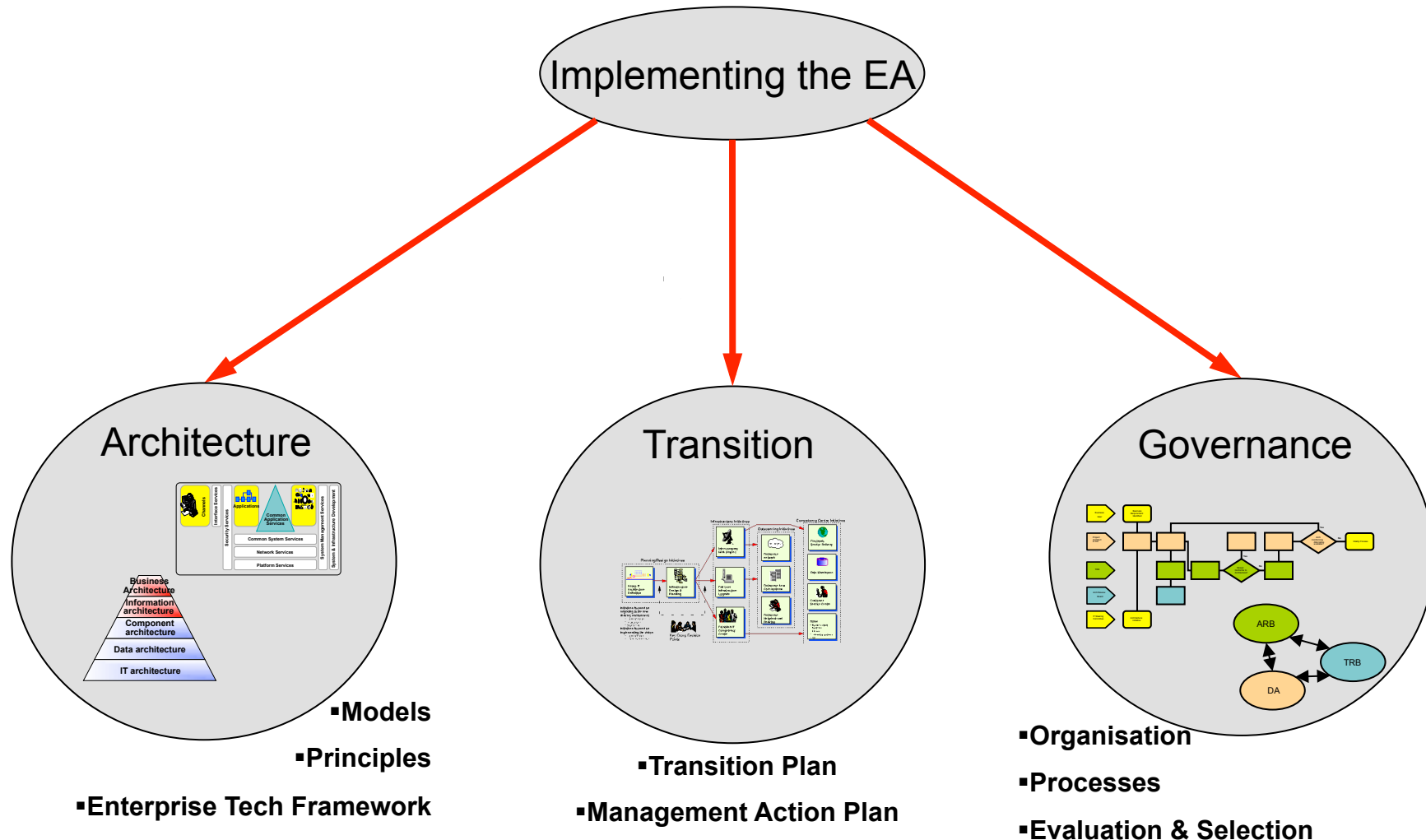
# Enterprise Architecture and Governance
## *(see Architecture Management)*

Source: IBM
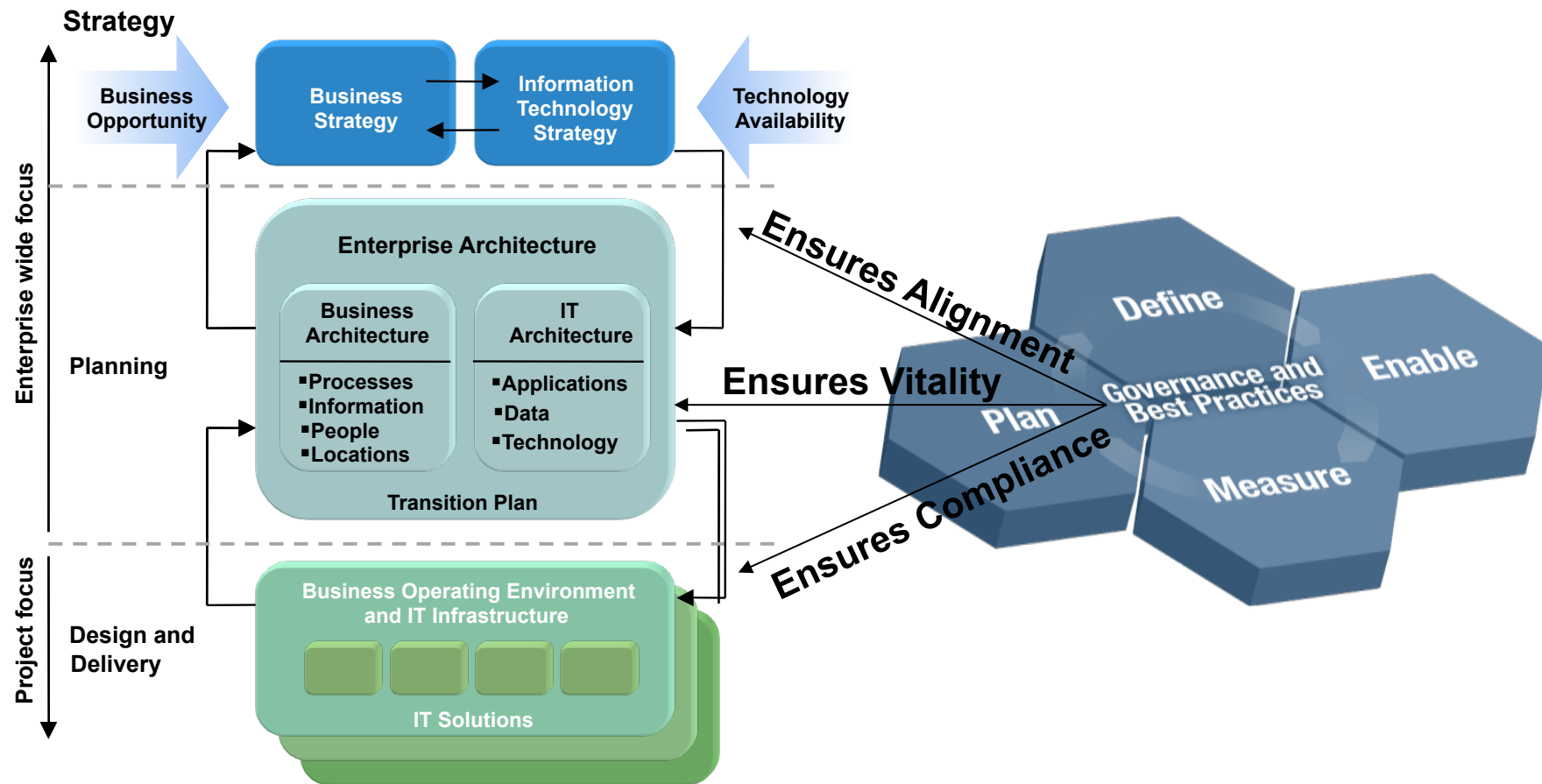
**Enterprise Architecture – Methodology**

# Enterprise Architecture vs. Solution Architecture

**Enterprise Architecture is the formal organization (design or layout) of the components, structures and processes required or relevant to the attainment of the goals and visions invested or envisioned in an enterprise.**
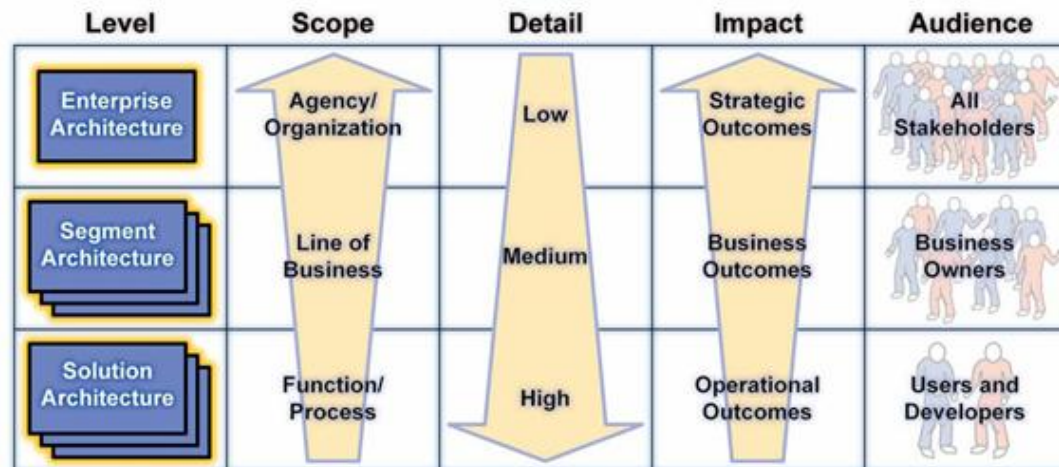


From US OMB 2006 FEA Practice Guidance

**Solution architecture aims to address specific problems and requirements, usually through the design of specific information systems or applications.**

Source: IBM

## So we recognise two different types of IT Architect…

- …Are responsible for ensuring the design of IT based business solutions meet the functional and non-functional requirements, within the constraints of budget, time, skills and other givens (such as IT Standards)
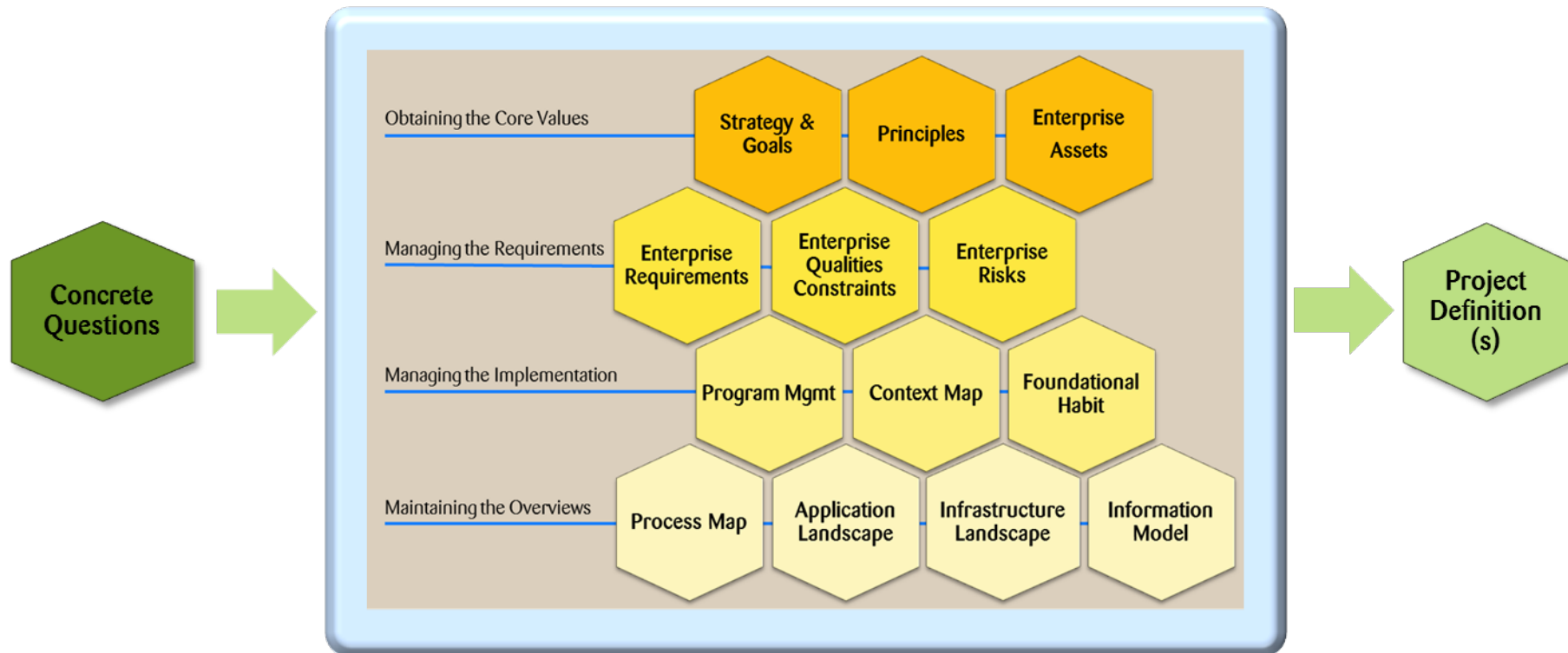
  *"Solution Architects"*

- …Are responsible for ensuring an IT Organisation approaches the identification, specification and implementation of these IT based business solutions in a co-ordinated and standardised manner, aligned to the Enterprise's Business and IT Strategies.
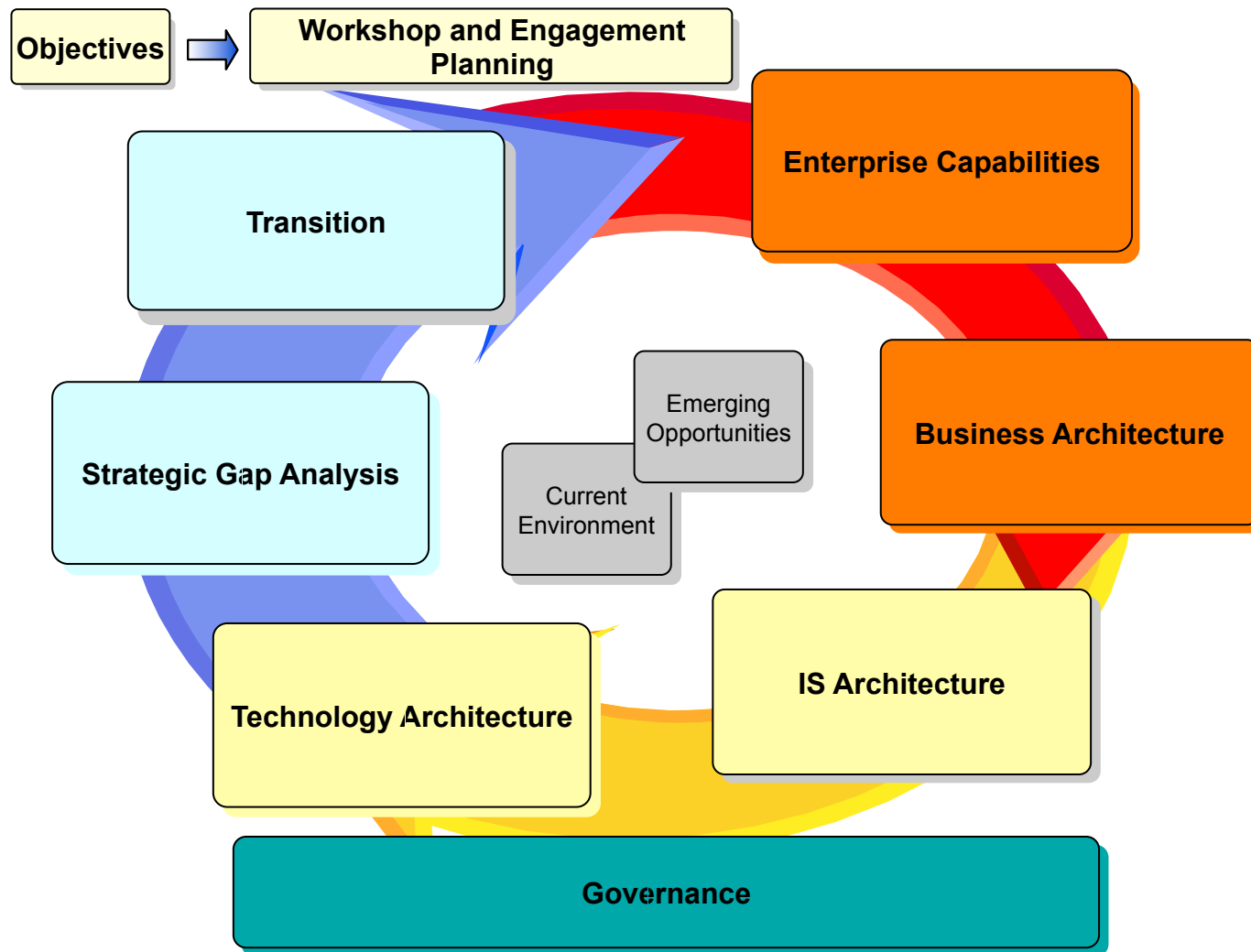
  *"Enterprise Architects"*

- …Are generally *not* product specialists, although they must be able to work at a sufficient level of technological detail to be sure their architectures can be implemented.

## Enterprise Architecture engagements are embracing *Essentials* as follows
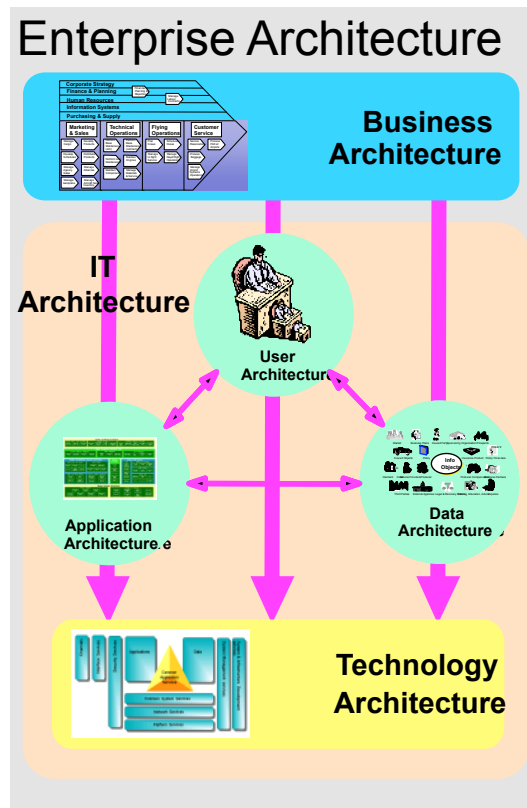


The EA essentials are applicable to all EA frameworks !

Source: Zühlke Engineering

# Best Practice shows that successful EA Management follows an *Iterative Approach* of EA Design

**Objectives** → **Workshop and Engagement Planning**

**Enterprise Capabilities**

**Transition**

**Business Architecture**

**Strategic Gap Analysis**

Emerging Opportunities

Current Environment

**Technology Architecture**

**IS Architecture**

**Governance**

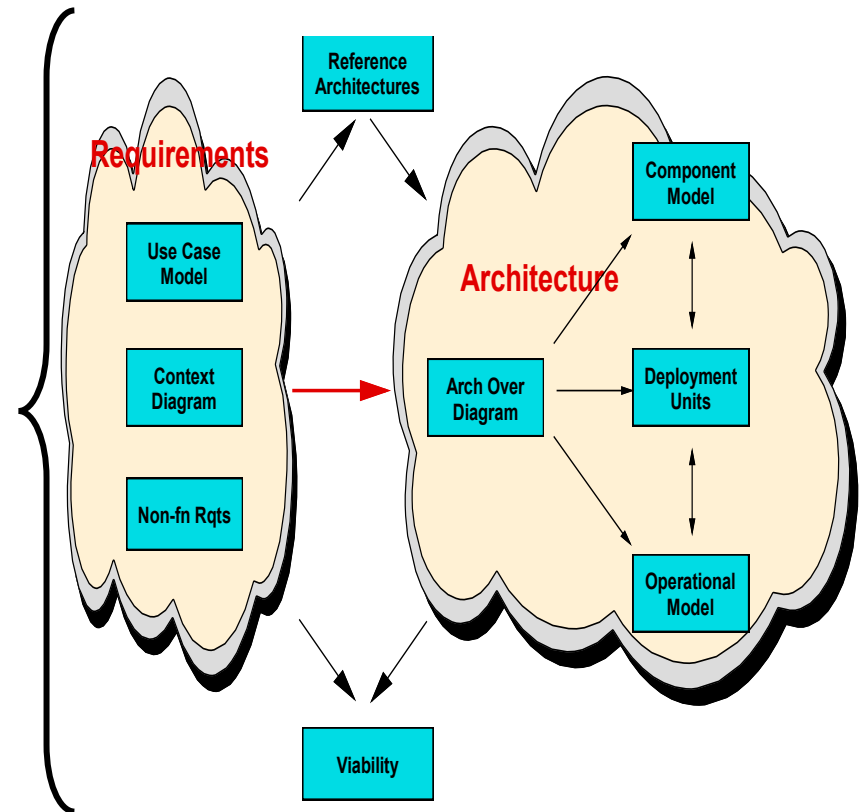Source: IBM

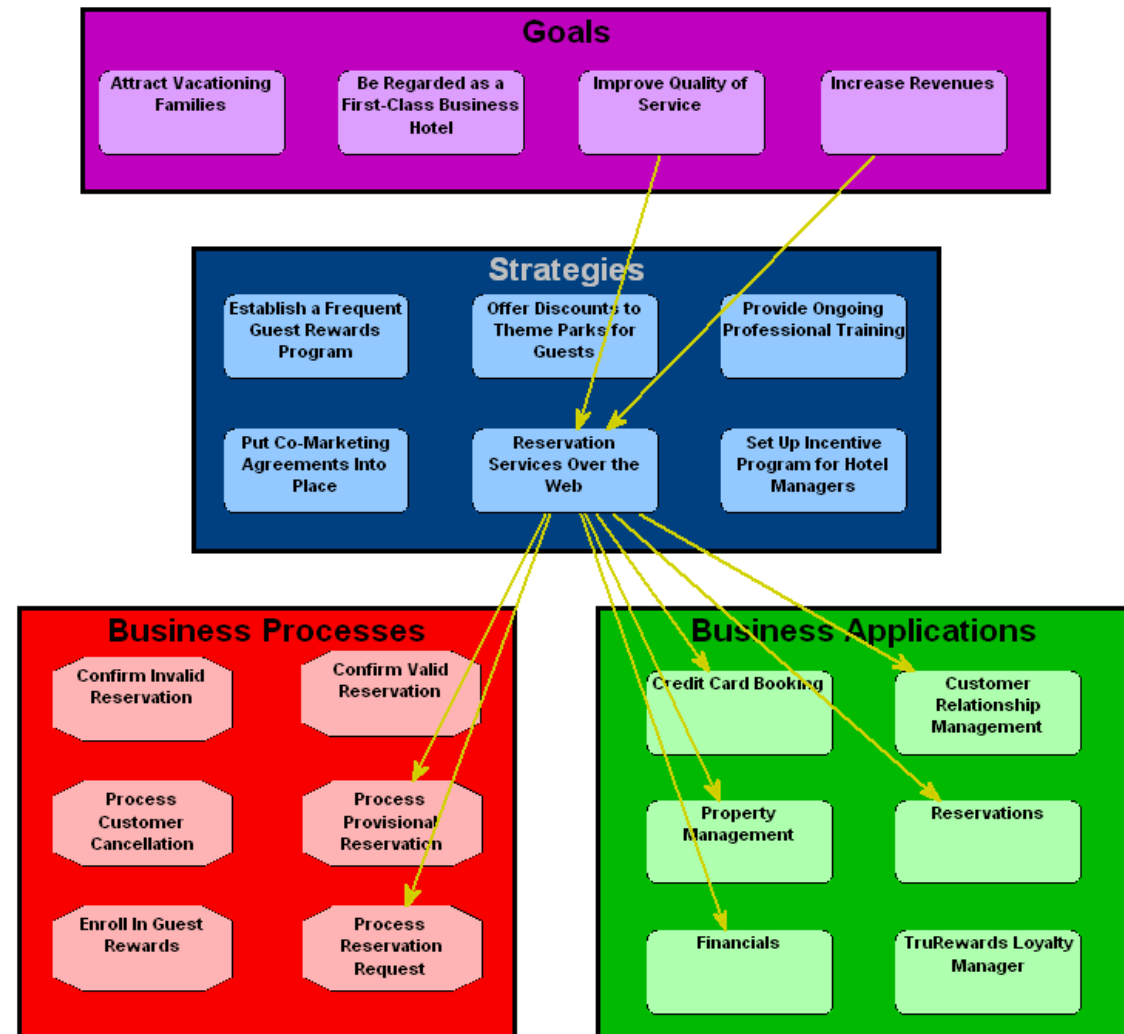# *EA Work Products* guide and govern how Solution Work Products are constructed (Same Types of Work Products)

Enterprise Architecture

Business Architecture

IT Architecture

User Architecture

Application Architecture

Data Architecture

Technology Architecture

"EA constrains and co-ordinates the construction of IT based business systems"

Reference Architectures

Requirements

Use Case Model

Context Diagram

Non-fn Rqts

Architecture

Arch Over Diagram

Component Model

Deployment Units

Operational Model

Viability

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Source: IBM

## *Benefits (1)*: Analyze the Linkage Between Technology and Business, Communicate Actionable Information

*"How have we aligned technology investment with our business objectives?"*

*"If we change our technology stack, what applications and organizations will be effected?"*



**Goals**
- Attract Vacationing Families
- Be Regarded as a First-Class Business Hotel
- Improve Quality of Service
- Increase Revenues

**Strategies**
- Establish a Frequent Guest Rewards Program
- Offer Discounts to Theme Parks for Guests
- Provide Ongoing Professional Training
- Put Co-Marketing Agreements Into Place
- Reservation Services Over the Web
- Set Up Incentive Program for Hotel Managers

**Business Processes**
- Confirm Invalid Reservation
- Confirm Valid Reservation
- Process Customer Cancellation
- Process Provisional Reservation
- Enroll In Guest Rewards
- Process Reservation Request

**Business Applications**
- Credit Card Booking
- Customer Relationship Management
- Property Management
- Reservations
- Financials
- TruRewards Loyalty Manager

# *Benefits (2)*: Analyze Change to Processes…

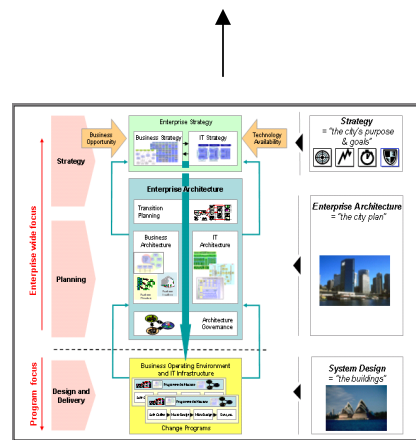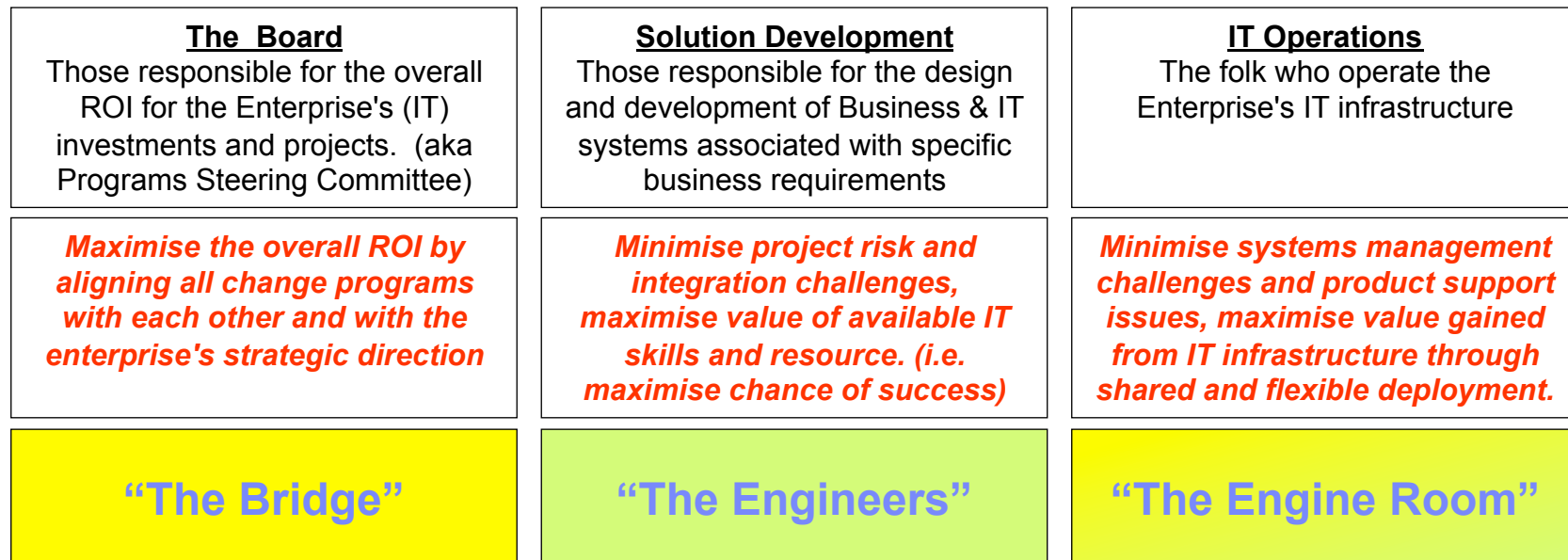What
Happens
If….?

**Focus on
Information
needed
to make
a decision**
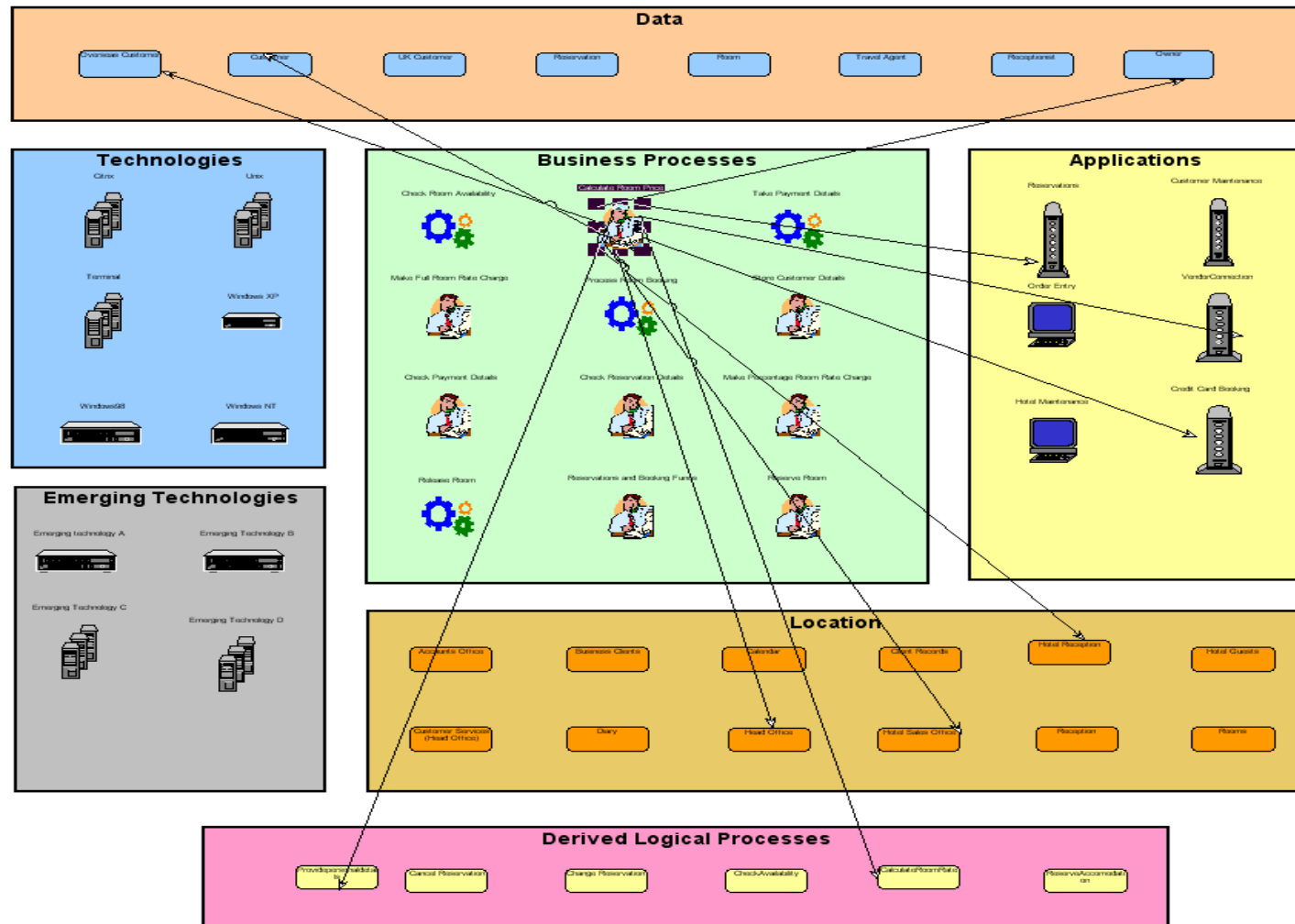
# And only when we can ensure it's "architecture all the way down", will we be able to satisfy all our stakeholders

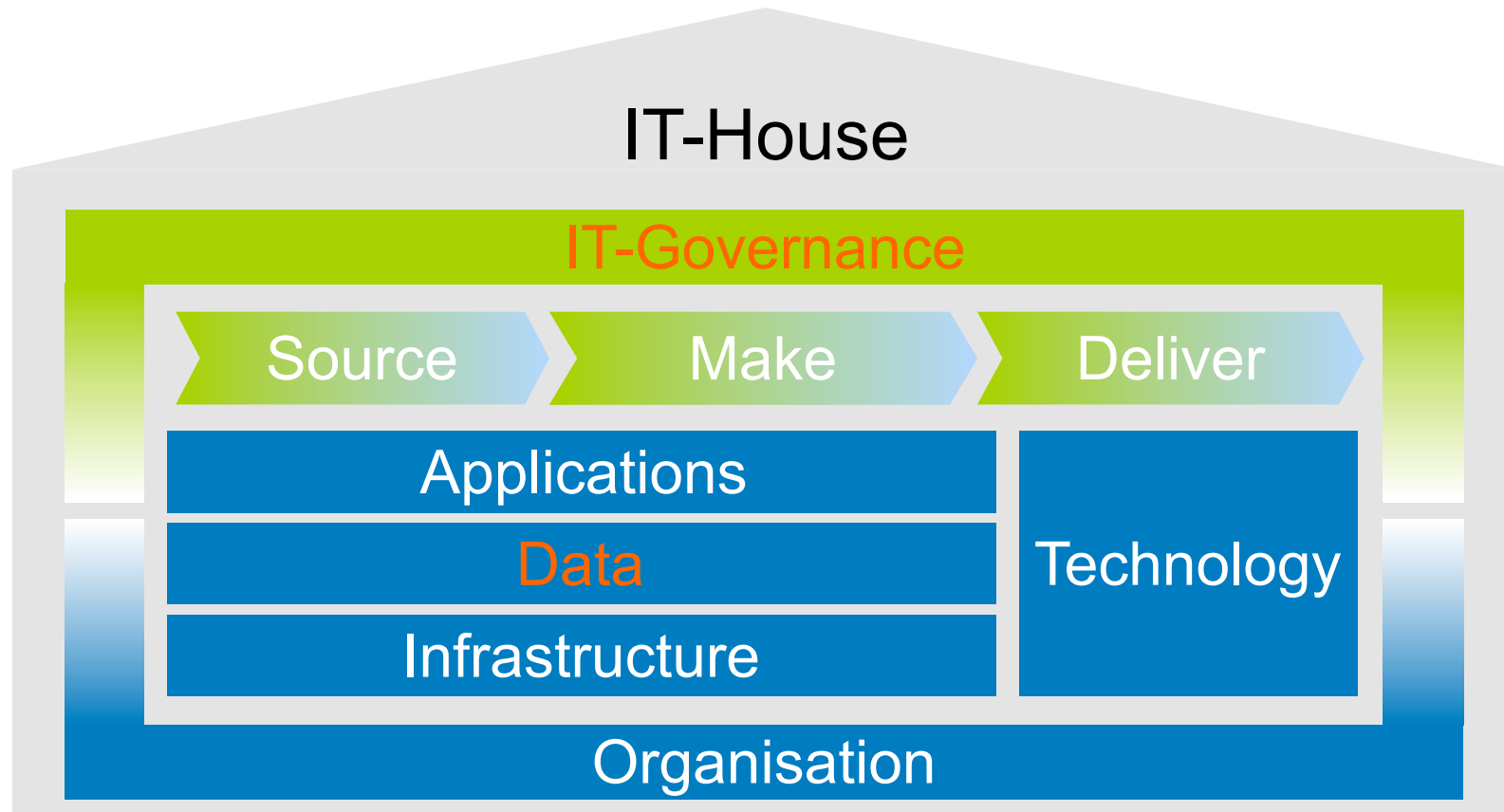| **The Board** Those responsible for the overall ROI for the Enterprise's (IT) investments and projects. (aka Programs Steering Committee) | **Solution Development** Those responsible for the design and development of Business & IT systems associated with specific business requirements | **IT Operations** The folk who operate the Enterprise's IT infrastructure |
|---|---|---|
| *Maximise the overall ROI by aligning all change programs with each other and with the enterprise's strategic direction* | *Minimise project risk and integration challenges, maximise value of available IT skills and resource. (i.e. maximise chance of success)* | *Minimise systems management challenges and product support issues, maximise value gained from IT infrastructure through shared and flexible deployment.* |
| **"The Bridge"** | **"The Engineers"** | **"The Engine Room"** |



Source: IBM

## Related Issues and Standards (Selection)

- **IT Strategy**
  - **Defining**
  - **Taking decisions**

- **IT Governance**
  - **Processes and Rules for the execution of IT development as well as IT operations**

- **Quality Management**
  - **Integral part of IT Management**

- **ITIL (Information Technology Infrastructure Library)**
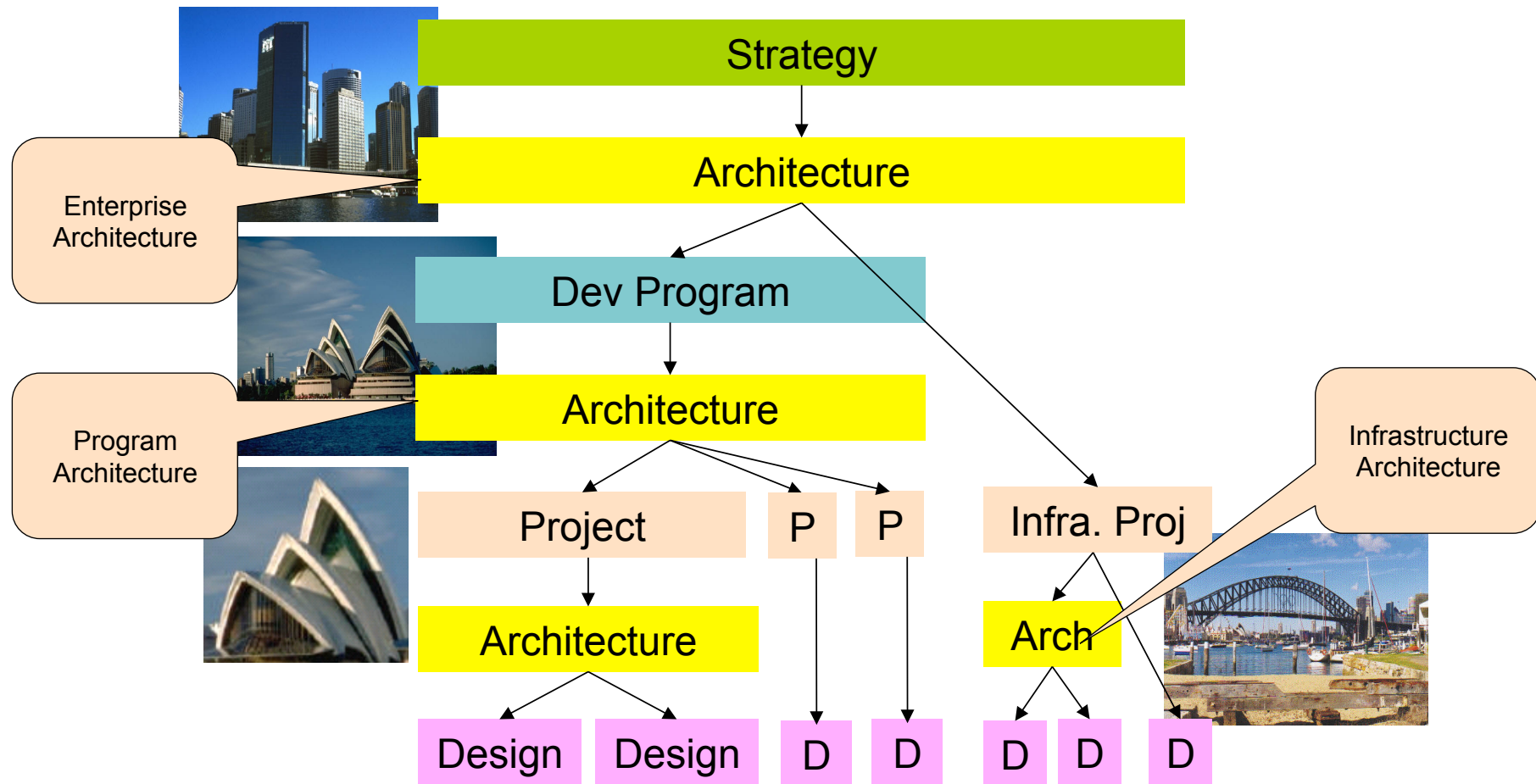  - **Practices for IT service management  (Deployment)**

## *IT Strategy*: Heat Map of IT House
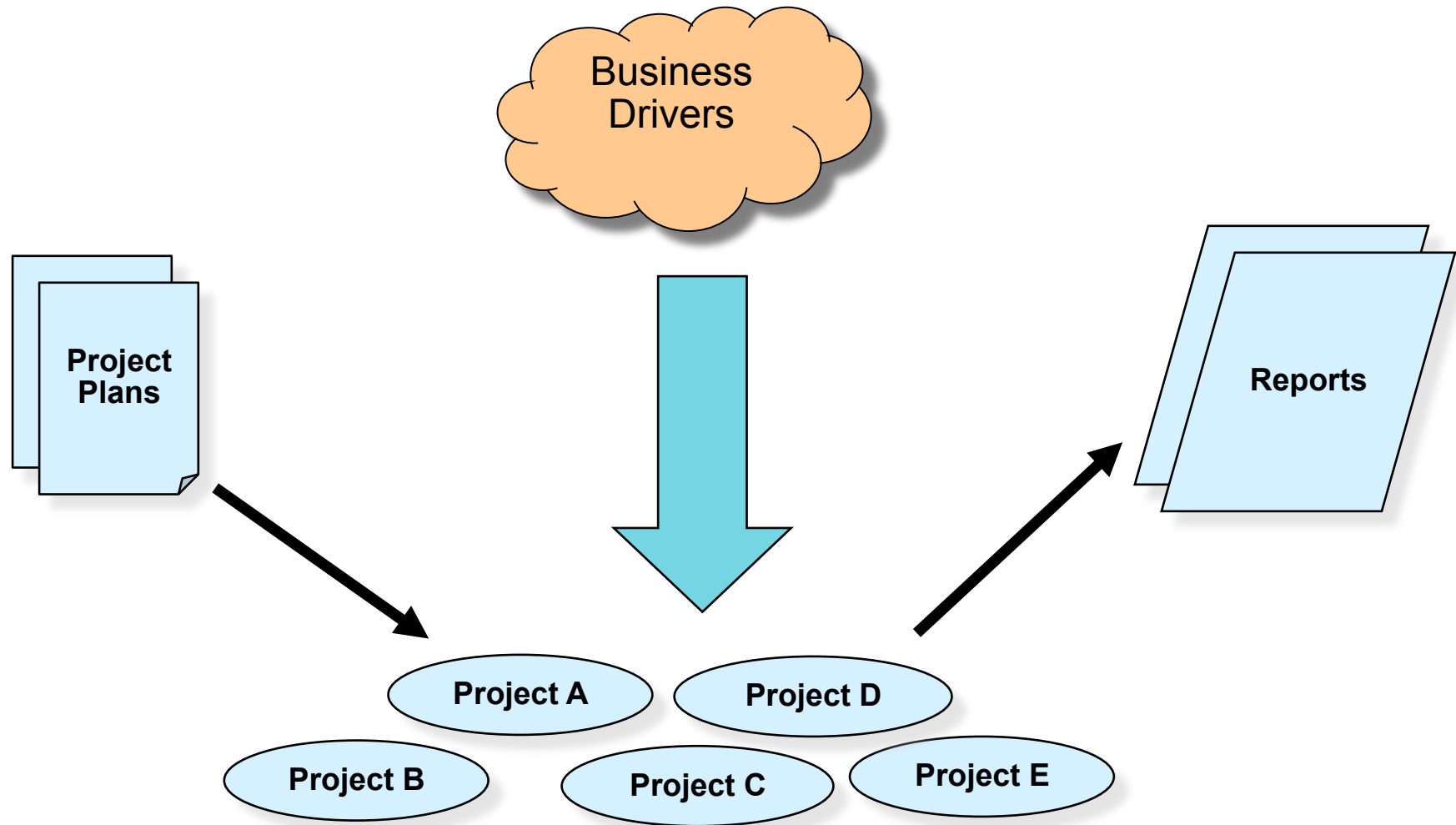### (critical aspects are IT-Governance and Data)



IT-House

IT-Governance

Source　Make　Deliver

Applications

Data

Infrastructure

Technology

Organisation

　Source: Zühlke Engineering

## Roadmaps, Programs, Projects

- **Roadmap**

  - **Overcoming identified gaps within a defined time frame**
  - **Moves *As-Is* status (baseline) towards *To-Be* status (target)**

- **Program**

  - **Support an initiative**
  - **Includes multiple projects**

- **Project**

  - **"Temporary endeavor" undertaken to create a unique product, service or result**
  - **Within defined time limits and budget**

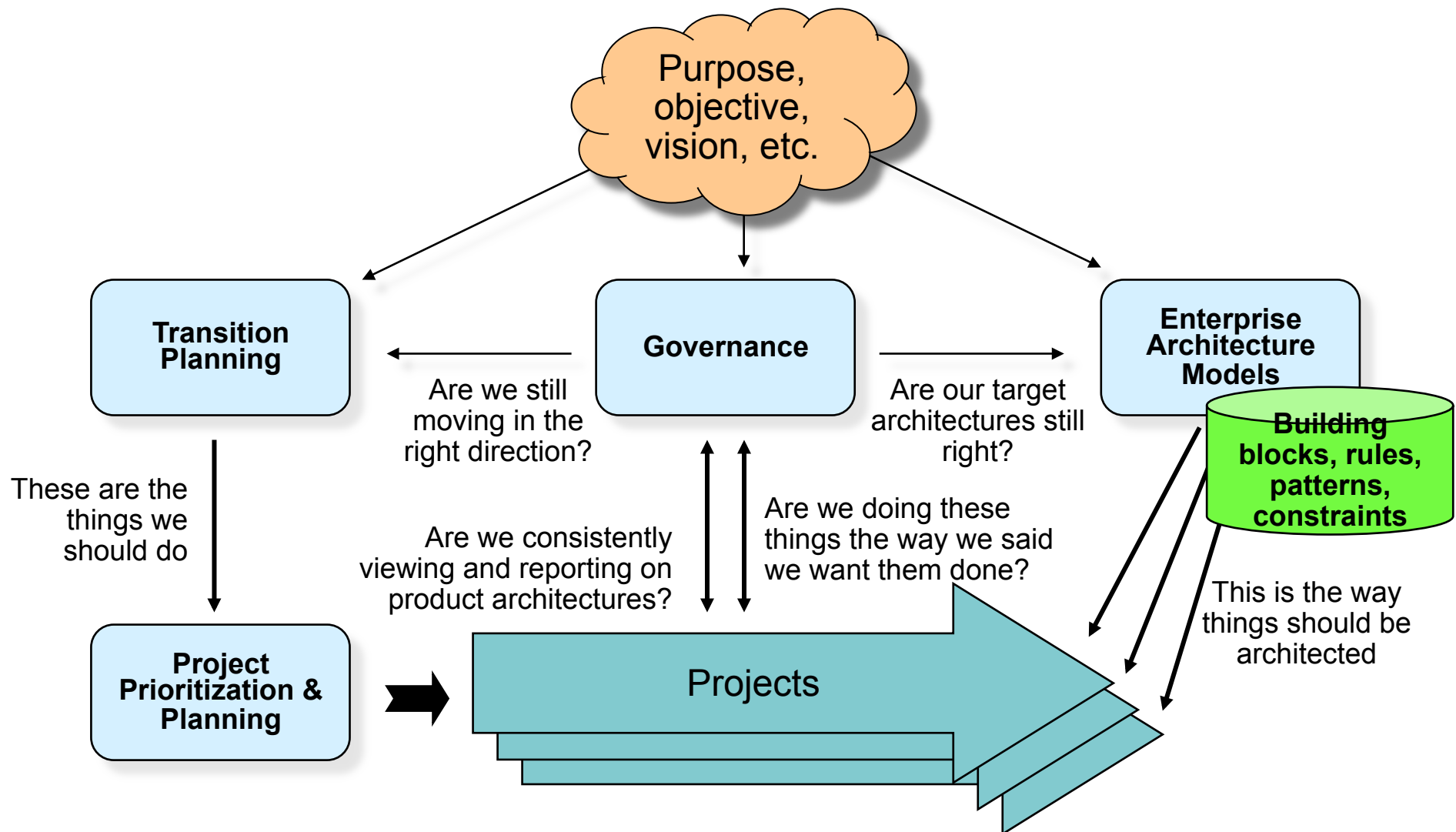# EA provides a context and guidance, keeping everyone "on the same road"



Strategy

Architecture

Enterprise Architecture

Dev Program

Architecture

Program Architecture

Project  P  P  Infra. Proj

Infrastructure Architecture

Architecture  Arch

Design  Design  D  D  D  D  D

Source: IBM

# Current Enterprise Planning and Control

# Enterprise Architecture Solution Overview



Purpose, objective, vision, etc.

Transition Planning

Governance

Enterprise Architecture Models

Building blocks, rules, patterns, constraints

Are we still moving in the right direction?

Are our target architectures still right?

These are the things we should do

Are we consistently viewing and reporting on product architectures?

Are we doing these things the way we said we want them done?

This is the way things should be architected

Project Prioritization & Planning

Projects

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**_Capabilities_:
Aligning Execution with Strategy**

## *Capabilities*: Introduction Comment

▪ **Focus on *Capabilities* enables EA to better organize Business, IS & IT assets to meet requirements**

▪ ***Examples***

  – **Single Face to the customer (360 view)**

  – **Ability to offer customized credit products**

  – **Ability to influence component quality**

▪ **Hints:**

  – **Let "C"-management express capabilities and explain how well they are handled (see Competitive Capabilities Map) – Getting Buy-In**

  – **Use CBM (Component Business Mapping) und SCN (Strategic Capabilities Network) – they are complementary**

# SCNs (Strategic Capabilities Network) link Strategy and Architecture via three key concepts.



Strategic Capabilities Network (SCN)
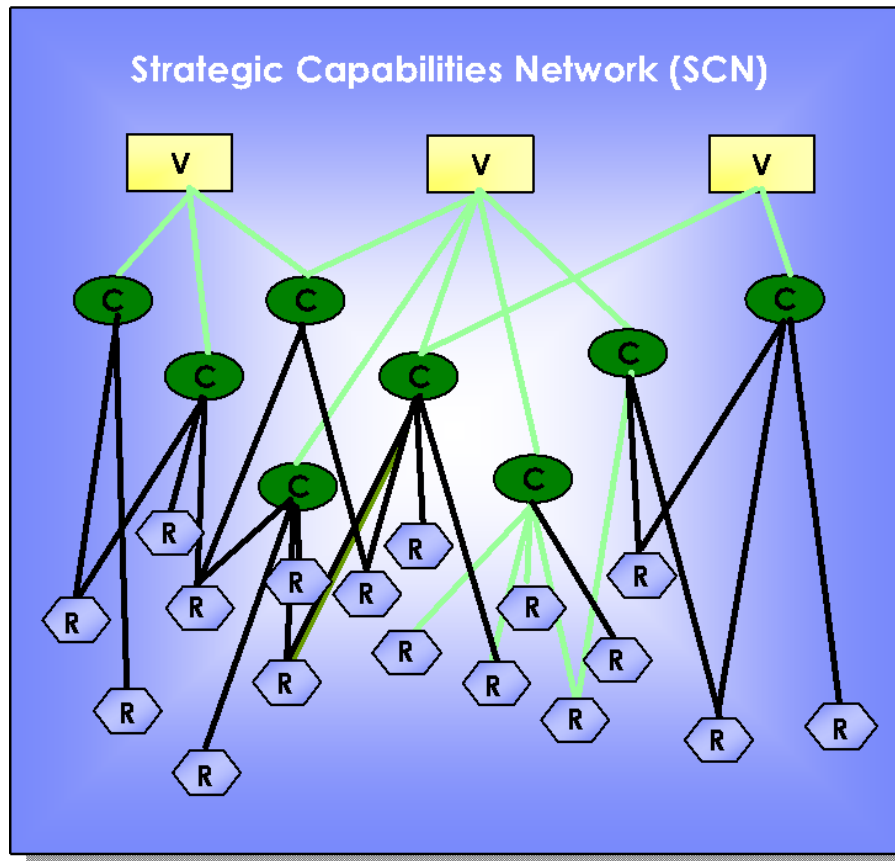
- *Value Proposition*: **What a company <u>needs to be</u> in order to offer a differentiated value to the market.**

  *Example: Ikea's low cost, customer convenience, modular design*

- *Capability*: **What a company <u>needs to do</u> in order to achieve its strategic positions. Capabilities perform, improve, and create the activities of the firm.**

  *Example: Ability to design for customer assembly, Ability to merchandise in-store and online.*

- Capability Enabler (*Resource*): **What a company <u>needs to have</u> in order to perform its capabilities. Resources represent the process, knowledge, organization and technology assets of the firm.**

  *Example: In-house engineers and designers, store locations, store layout expertise, web developer/programmer, server…*

Source: IBM

# *Enterprise Capabilities*: Aligning Architecture to Strategy (Example Amazon)

Source: IBM
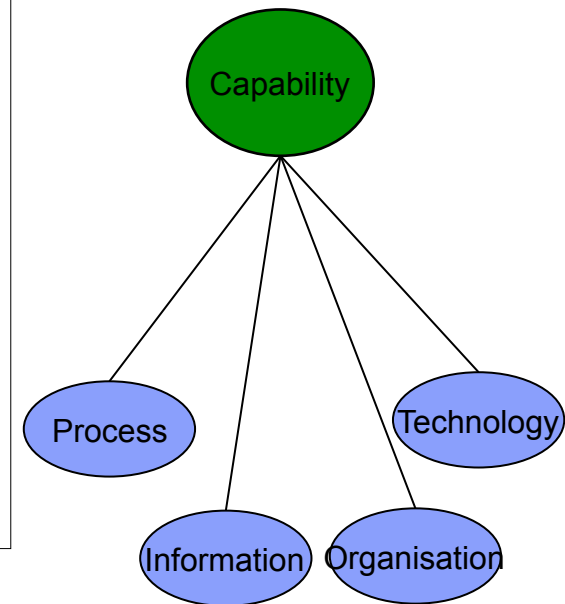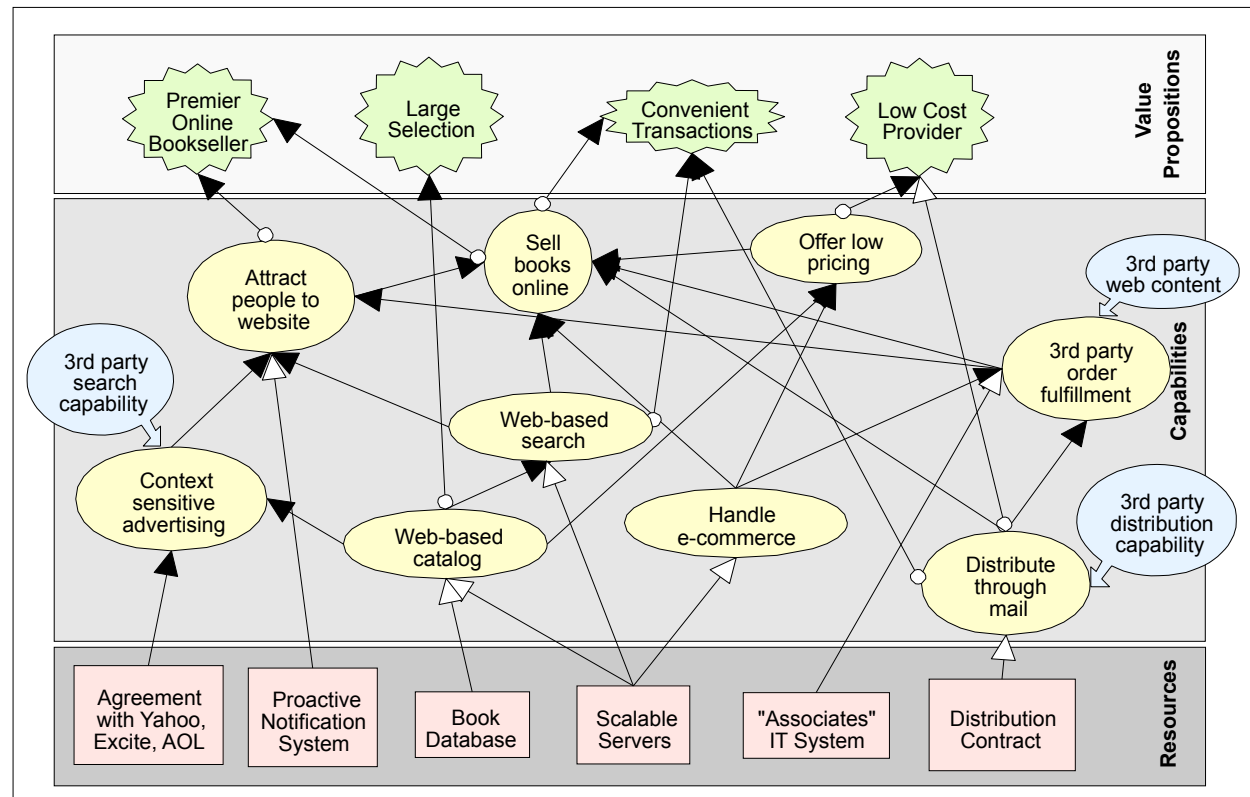
## *Capabilities in More Detail*

- *Standard Definition*: **A business capability, or simply a "*Capability*", defines what a business does. It does not communicate or expose where, why, or how something is done — only what is done.**

- **"*Capability Mapping*" is a methodology of Business Architecture, which is used to align strategic objectives and tactical demands; Capability Maps reflect the "what" of the business into architecture.**

- **Capabilities are relatively stable (companies need always again the same capabilities, like customer relationship management etc.)**

- **Capabilities are well understood by business, it can be judged how well they are supported by IT (and furthermore they can be linked later to business components, or a blueprint of the Business Architecture)**

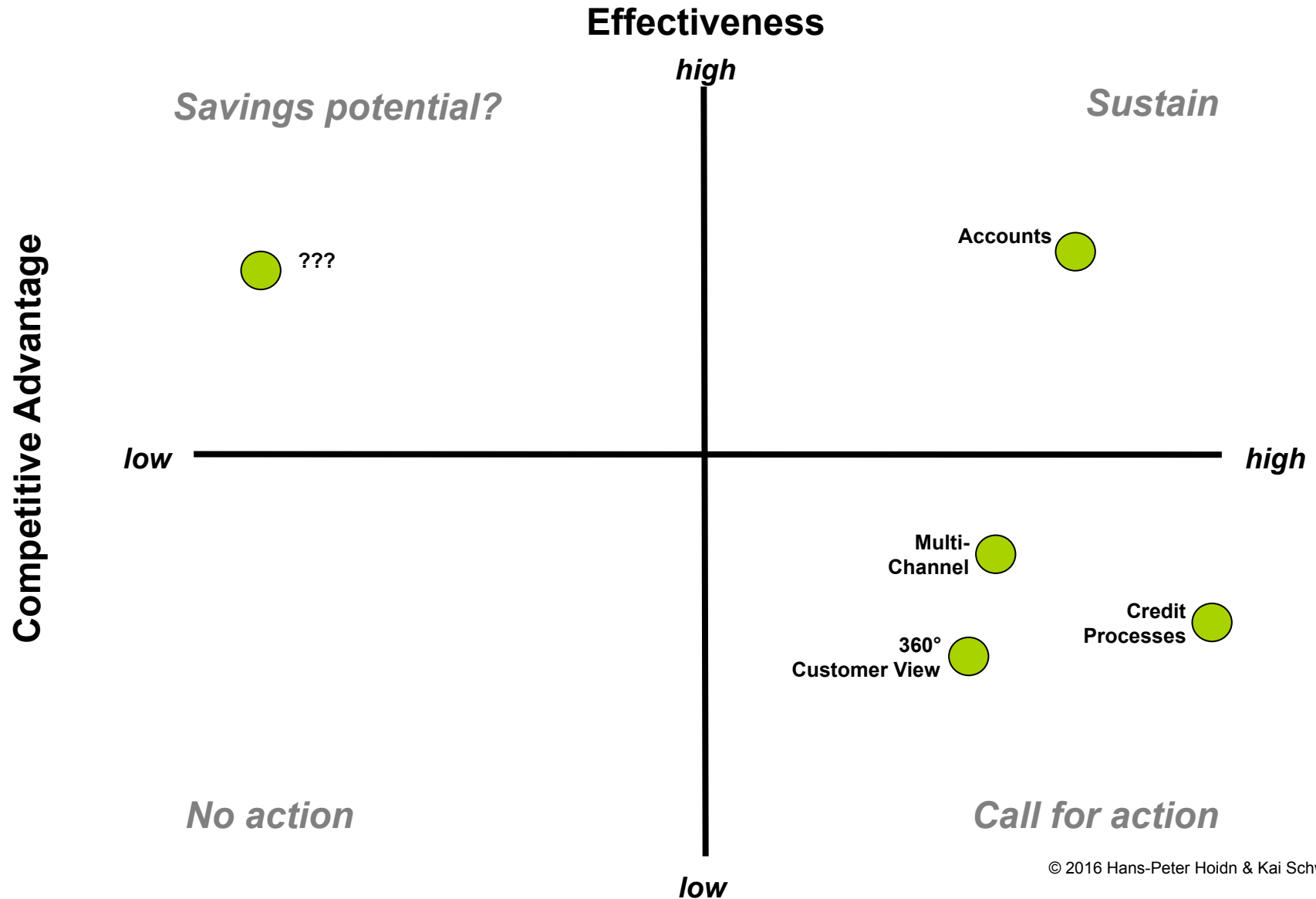# Positioning Capabilities with Business Architecture Knowledge Base



Copyright ©2013 Business Architecture Guild: BIZBOK Guide          © 2016 Hans-Peter Hoidn & Kai Schwidder
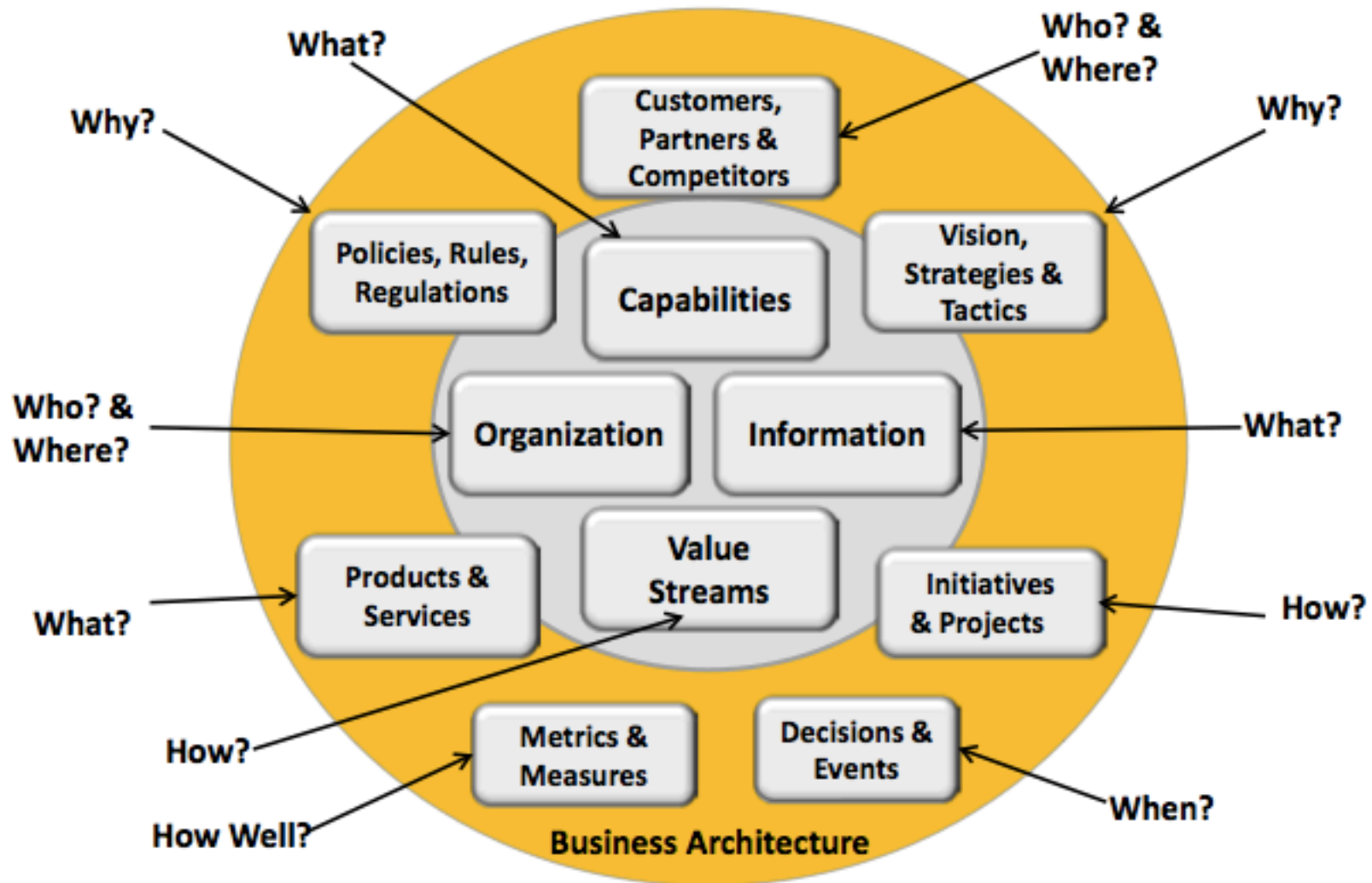
# *Illustration*: Standard Capability Map
## (Quote from the Internet – "heat map" can be added – is close to a CBM)



**Business Capabilities Map**

| Products | Sales | Marketing | Member Mgmt | Provider Network Mgmt | Health Care Mgmt | Claims Processing | Customer Service | Finance and Regulatory | Support Business Functions | Pricing & Risk | Information Tech |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benefit Management | Broker Programs | Customer Communication | Group And Broker Service | Network Development | Care Management | Claim Adjudication | Member Service | Accounting | Administrative Services | Alternate Funding | Enterprise Architecture |
| Contract Development | Commercial Sales | Lead Management | Group Installation | Network Management | Community Health Management | Claim Adjustment | Provider Service | Accounts Payable And Receivable | Business Analytics | Community Rating | Application Development |
| Filing And Regulatory Approval | Customer Communication | Prospect Management | Member Enrollment Management | Interplan Network Management | Disease Management | Claim Receipt | Broker Service | Actuarial | Contracts And Procurement | Experience Rating | Infrastructure Support |
| Product And Pricing Strategy | Government Sales | Campaign Management | Member Management | Pharmacy Admin | Healthcare Policy Management | Claim Triage | Group Service | Budgeting And Forecasting | Corporate Admin | Medicare Risk Adjustment | Portfolio and Demand Management |
| Product And Service Development | Renewal Management | Customer Data Management | | Provider Operations | Medical Utilization Management | Claim Workflow | | Claims Based Billing And Invoicing | Corporate Communication | Rating And Underwriting | Project Management |
| Product Lifecycle Management And Implement | Sales Operations | Loyalty Management | | Provider Pricing | Quality Health Informatics | OPL And COB Processing | | Collections | Document Services | Risk Management | Information Security |
| Product Management | Sales Performance Management | Marketing Analytics | | Provider Quality Management | Wellness | Reimbursement And Notification | | Payments Premium Reconciliation | Human Resources | | Data Management and Integration |
| | | Marketing Resource Management | | Provider Reimbursement Support | | | | Reserve Management | Quality And Data Governance | | |
| | | | | Provider Relations | | | | Taxation | Telecom | | |
| | | | | | | | | Treasury | | | |

# *Illustration*: Competitive Capability Map (Shows "Quality")



**Effectiveness**

*high*

Savings potential?                 *Sustain*

**Competitive Advantage**

**Accounts**

*low*          **???**                       *high*

**Multi-Channel**

**Credit Processes**

**360° Customer View**
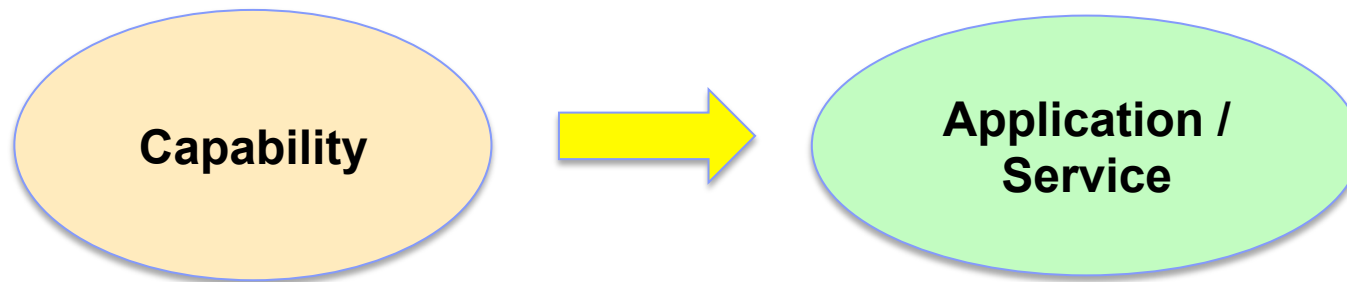
*No action*                   *Call for action*

*low*

## *Talk to Management and Capture their Goals and Needs* – by using "Competitive Capability Map"
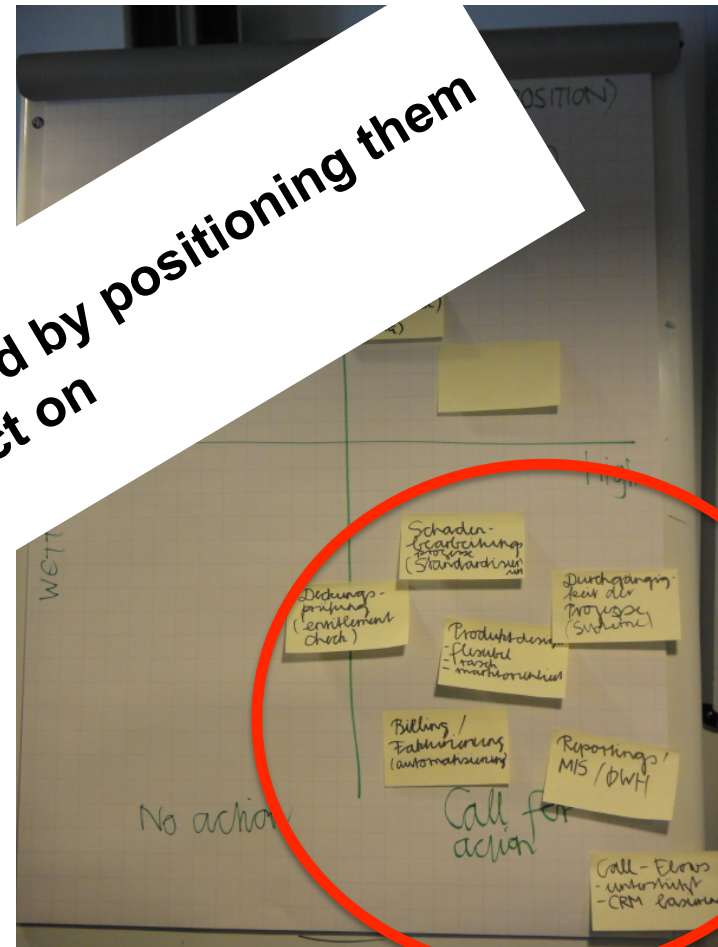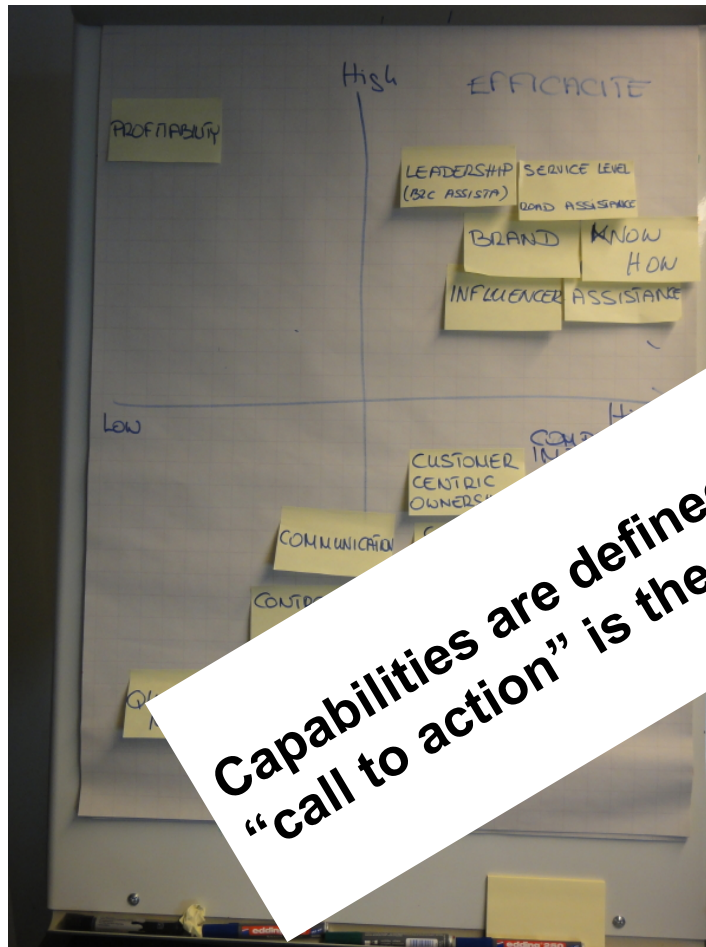


Capabilities are defined and rated by positioning them "call to action" is the area to act on

## *Capabilities and IT*: Automated via Applications / Services



▪ *A Capability is automated via Application / Service*:

  – **Relationship is n:m**

  – **Redundancies ?  Will be some work for the Enterprise Architect !**

  – **Goal: clear business foundation for service / application design**

| Dept. | Capability | IT |
|---|---|---|
| X | Claim Processing | Claim System 1 |
|  | … |  |
| Y | Claim Processing | SAP |
|  | … |  |

## Remarks on "Capabilities"

▪ **Users**

– *Capabilities are mandatory for good strategic management" (Swiss Manager)*

– *Capabilities* drive appropriate plan for applications and services

▪ **Outlook**

– *Capabilities* are part of a value stream

– *Capabilities* are key part of Business Architecture (See publications from the *Business Architecture Guild*)

Questions

# References

- **EA**
  - *Enterprise Architecture at Work,* Marc Lankhorst et al., 2nd edition, 2009
  - *IT-Unternehmensarchitektur*, Wolfgang Keller, 2. Auflage, 2012

- **Capabilities**
  - *TOGAF* Part VII – Capability Framework
  - *BIZBOK Guide*, Business Architecture Guild, Version 3.5, 2013
  - *Business-Alignment herstellen mit Capabilities*, 4.2 in Wolfgang Keller, IT-Unternehmensarchitektur
  - http://www.capstera.com (Capability Mapping Tool)