A new approach to enterprise architecture to meet business needs.
The technology landscape is changing rapidly.
The **demographic landscape** is changing rapidly.
The **user experience landscape** is changing rapidly.
Is Architecture dead in the age of Design Thinking and Agile?

Is Enterprise Architecture dead?
IBM’s global thought leader for Agile, Scott Ambler, said we need Enterprise Architecture “Discipline” (including EA) is needed to succeed on agile at scale.

“Our experience is that “core” agile methods such as Scrum work wonderfully for small project teams addressing straightforward problems.

However “out of the box” these methods do not give adequate consideration to the risks associated with delivering solutions on larger enterprise projects.”

There are an increasing number of high-profile project failures associated with agile strategies.

If we don’t start supplementing core agile practices with a more disciplined approach to agile projects at scale, we risk losing the hard-earned momentum that the agile pioneers have generated”.

Scott Ambler .. Disciplined Agile .. 2012
Scaled Agile has a clear role for Enterprise Architects
Ultimately the EA role in SAFE is “fine tuned” to the Agile environment

- Maintain holistic vision
- Aligns business drivers with technical decisions
- Sets technology standards
- Drive common infrastructure
- Influences modeling, design and coding practices
- Facilitates reuse of emergent solutions, knowledge & patterns
- Synchronizes issues and NFSs across solutions

Source: http://scaledagileframework.com
How does “Agile” Enterprise Architecture differ from traditional EA?

- EA demands one approach to fit all projects - typically big design up front
- EA repeatedly known for slowing projects down and saying “No”
- EA hampers innovation
- EA is a “behind the scenes” activity with little stakeholder interaction.
- EA focuses on topics of little relevance to current business and projects
How does “Agile” Enterprise Architecture differ from traditional EA?

**Iterative and Incremental Development** of the EA “Building Code” in an Agile manner

**Mitigate complexity by making key Architecture decisions in an Agile manner** - deferring decisions until proven effective through “probes” like “proof of concepts”

**Engage stakeholders** by providing insights and value at every EA increment through inclusive workshops and demos.

**Enables** Project Agility by providing “how to” guidance and supporting innovation (instead of saying “no”!).
AGENDA

• Enterprise Architecture Capability
• Upstream & Downstream EA
• IBM’s Enterprise Architecture Framework
• Business Architecture
• Information Systems Architecture
• Technology Architecture
• Summary
• Appendix
Enterprise Architecture Capability
Technical Control - What happens without it?

Benefits of AGILE?
Uncontrolled, Siloed, Incremental, Progressive, Complexity
A better way: Planned, Controlled, Evolved, Order.
What is Enterprise Architecture?

The "planning" function between strategy and implementation
When Strategy and Architecture are aligned – amazing things will happen!

**Upstream: Doing the right things**

- **Identifying, funding & resourcing the most important initiatives**, in line with the business strategy and within the investment budget, in the right sequence.
- **Supported by: enterprise models** to enable “big picture” strategic analysis and planning.

**Downstream: Doing things right**

- **Ensuring solution implementations** work within existing business and IT environment constraints and **contribute towards realization of the enterprise’s strategy**.
- **Supported by: appropriate standards** for delivery of projects and services.

"Good navigation" "Good engineering"
Enterprise Architecture enables “doing the right things right”

1. Aligning execution with strategy produces:
   • Projects and decisions supporting the enterprise direction

2. Aligning IT with business means:
   • Business payback from IT investment
   • Better communication and insight between business and IT

3. Optimizing sharing and interaction improves:
   • Quality
   • Speed
   • Flexibility/Agility
   • Integration
   • Cost
EA models support business and IT transformation by “divide and conquer”. envisioning the target solution space via “building blocks” (viewpoints)
EA Models provide guidance to...

Enable both Enterprise Planners and Solution Designers

What are the needs of Enterprise Strategists and Planners?

What are the needs of Solution Designers?
Upstream & Downstream
Enterprise Architecture
EA enables controlled change by...

Providing orientation, guidance and governance through Enterprise Models and Plans

Think 2019 / DOC ID / September 19, 2019 / © 2019 IBM Corporation
A well functioning EA delivers two major Value Propositions to the Enterprise

Upstream ensuring the organisation is identifying, funding & resourcing the most important programmes, in line with the business strategy - “Doing the right things”

Strategic Intent

“doing the right things”

“These are our Enterprise Models and Roadmaps”

“Are we designing these systems the way we said we want them done?”

“Are we still moving the right direction?”

Strategic Plan

“Business as Usual” project prioritization & planning

“Are we designing these systems the way we said we want them done?”

Multiple Strategic Initiatives

Plan | Build | Run

Downstream ensuring these programmes are delivering solutions that meet the needs of the business and work within the existing environment - “Doing things right”

EA Governance

“Are our target architectures still right?”

“This is the way these systems should be designed”

EA Models & Guidance

Business Architecture

IS Architecture (Apps & Data) Technology Architecture

Upstream ensuring the organisation is identifying, funding & resourcing the most important programmes, in line with the business strategy - “Doing the right things”

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EA Governance

“Are our target architectures still right?”

“This is the way these systems should be designed”

EA Models & Guidance

Business Architecture

IS Architecture (Apps & Data) Technology Architecture
In addition, Enterprise Architecture helps address

### A few key challenges for most enterprises

#### Business & IT Strategic Alignment
- Insight into how complex IT underpins Business Capabilities
- Visibly link IT decisions to Business Strategies and Objectives

#### Agility and better IT Responsiveness
- Deeper understanding of Business, ability to anticipate business needs
- Design for Reusability and flexibility to improve Speed to Market

#### Improved Risk Mitigation
- Structured models to visualize current environment and gaps
- Allow focus on high risk area, choose mitigation strategies with greater clarity

#### Costs & Complexity Reduction, Simplification
- Consistency and standards: fewer technologies to maintain, better use of skills
- Retire expensive infrastructure and applications, reduce legacy, remove obstacles to business change

#### Decision Support
- Consistent information across planning and execution of Transformation Initiatives
- Realistic planning information
- Effective coordination of Implementation Decisions
IBM’s Enterprise Architecture Framework
While there is no single definition of Enterprise Architecture across the industry...

most existing definitions agree about the spirit of EA

**IBM:** *Enterprise Architecture defines the architectural models, governance, and transition initiatives needed to effectively coordinate stakeholders toward a common goal.* IBM Academy of Technology

**Gartner:** *Enterprise Architecture is the process of translating business vision and strategy into effective enterprise change by creating, communicating & improving the key principles and models that describe the enterprise's future state and enable its evolution.*

**Wikipedia:** *Enterprise Architecture is the organizing logic for business processes and IT infrastructure reflecting the integration and standardization requirements of the firm’s operating model (Data? Applications? Governance)*

**Client:** *Enterprise architecture is a set of processes, guidelines, models and frameworks, which help translate business strategy into IT implementations that result in business value.*

**PEAF:** *Enterprise Architecture is about knowing where we are, what we have & where we want to be to ensure we build systems & processes which create value & don't paint us into a corner.*

**TOGAF:** *Does not explicitly define EA (ref: TOGAF Glossary and ADM)*
Many “Frameworks” have been suggested to organize Enterprise Architecture information in an intuitive, non-overlapping yet interlinked way.

- The Open Group’s Architecture Framework (TOGAF)
- Gartner Group’s Enterprise Architecture Framework
- Pragmatic Enterprise Architecture Framework (PEAF)
- IBM’s Enterprise Architecture Framework
The IBM Framework organizes EA Models and Guidance to cover multiple interrelated domains...

- **Strategy Domain**: Strategic Intent, Future State and “Value Propositions”, Capabilities to realise Strategy, Resources to enable capabilities

- **Business Domain**: Process activities, information and human elements of the business, Relationships between these elements

- **Information Systems Domain**: Automated Business Functions & Data, Potentially shared and/or reused, Common Characteristics of IT Users, Relationships between these elements

- **Technology Domain**: Automated elements of infrastructure functionality and data, Most likely shared, basis for integration, Relationships between these elements
And finally how to set up roles and governance bodies that share a common vision and can effectively collaborate to realize the benefits from EA.
Business Architecture
A Business Architecture provides many benefits...

**A Business Architecture is used to:**

- Provide an understanding of how the business is structured and how it serves a given market place
- Describe current and futures states of the business
- Help identify future initiatives for the business and use of technology
- Document the alignment of the business strategy to enabling IT transition plans and projects
- Guide future IT investment as it allows the identification of functional areas targeted for change
- To understand the business context in which a system will work
- Help an organization to meet the challenges of a rapidly changing marketplace.

“A Business Architecture is the structure or structures of a business, which comprise processes, resources, goals, and information, the externally visible properties of those parts, and the relationships amongst them.”
The Business Architecture domain includes:

Work products spanning all of the business architecture layer’s themes

And in each case, the BA WPs are influenced by WPs in the Capability Neighbourhood
In summary, these BA work products model the enterprise from a series of viewpoints, structuring the functional resources needed by the business and assessing how they should be deployed to meet the enterprise’s operational needs.
Information Systems Architecture
Along with the Technology Architecture, the IS Architecture represents...

The “digitized” elements of the EA – together referred to as the IT Architecture

- Strategic Intent and “value propositions”
- Capabilities to realise that intent
- Resources to enable these capabilities

- Function, information and human elements of the business
- Relationships between these elements

- Automated elements of business functionality and business data
- Relationships between these elements

- Automated elements of infrastructure functionality and data.
- Relationships between these elements.
The IS Architecture layer of the EA framework...

Sorts the various “business-dependent IT” ABBs into an organised set of IS Architecture work products
In all cases, there are two steps:

First, the selection of what to automate (and what not to)...

At this time, there are no formally documented “top down” techniques or approaches to deciding which bits of the Business Architecture should be automated. It is, largely, inspired via experts’ insight

There are many sources of inspiration:

- Currently automated business activities and digitised information
- Analysis of existing IT systems against Business Architecture
- Assessment of the Business Architecture’s non-functional requirements
- Industry standard Reference Architectures
- Analysis of current operational issues
- Existing strategic decisions
- Package Selection decisions
- Sourcing decisions

It is usually therefore necessary to refine, sometimes even identify from scratch “bottom up”, the Business-IS Architecture boundary based on subsequent project level decisions for automation/digitisation, such as:

- via the identification of standard Use Cases
- other man/machine boundary decisions
Second, deciding how to...

Organize and structure this for the automated environment.

Evolution of software architectures (integration/coupling)
Second, deciding how to...

Organize and structure this for the automated environment.

- **What qualities or attributes are we looking for in the IS Architecture’s Building Blocks?**
  - No redundancy – facilitating high levels of reuse
  - Loose coupling between components
  - High cohesion within components
  - Minimal technology dependencies

- **Plus, for an architecture focused “upstream” (targeted on transition planning)**
  - An enterprise-wide picture of all IS Architecture BBs (maybe “on-a-page”)
  - Large grained (e.g. Account Management)
  - Basis / foundation for definition of more granular (solution focused) components

- **And for a “downstream EA” (focused on guiding and governing solution design)**
  - ABB’s that are at level that solution architects would use in their solutions.
  - Small grained (e.g. “address management”)
  - Based on / bounded by enterprise-wide components
So how do we create the IS Architecture?... It depends!

How this happens depends on the approach taken to model the BA and ISA: either a "classical" or "contemporary (component/services)" approach.
Depending on the inputs available and approach taken...

Several different transformations from the Business Architecture are possible to the IS Architecture.

![Diagram of Enterprise Business Architecture](image-url)
There are two common approaches to articulating IS Architectures...

Commonly found together to varying degrees in most Enterprise Architectures

“Classical” separation of function from data

- Automated functions are grouped and documented in an Application Functional Model
- Data stores are defined and documented

Component/Services Orientation

- Partitioning the enterprise’s automated capabilities into components, typically offering services
- Components encapsulate responsibilities (functionality) and data
- Realization of some components could be through custom development, Enterprise Applications (ERP), or legacy applications.
- Most large enterprises continue to have a healthy legacy function/data foot-print that co-exists with ERPs.
- Many organizations adopted “middle-ware” as a means of extending integration across the enterprise – in most cases making IT even more complex.
- Componentization and cross-enterprise (re)use may be achieved via the adoption of Service Orientation, an architectural style which has the potential to deliver significant benefits if its adoption across the enterprise (rather than “just” within programmes) can be achieved
- Both functionality and data are offered as services
Technology Architecture describes the basic technology infrastructure needed for...

Efficient & effective automation of the business. Technology standards plus usage / procurement guidelines are the historical starting point for Enterprise Architecture.

- **Business Architecture**: A business architecture has no regard for the use of automation.
- **Information Systems Architecture**: An information systems architecture describes those aspects of the business that are to be automated – sometimes known as the "business dependent IT architecture".
- **Technology Architecture**: A technology architecture describes the underlying, "business independent" IT needed to support automation.
An Technology Component Models (TCM) enables you to...

Organize your architecture building blocks in a systematic way and preselect what Solution Designers can use.
And let’s go back to the Lego blocks …

Component — a specific type of Lego block. Examples include window, wheel, brick. Components are often grouped together into parts like windows.

Categorisation of Components — a catalog of Lego parts. A good catalog sorts components so they are easy to find and use. Do you sort your blocks by colour, or by shape, or by holes? Which is more productive? What is more efficient?

Principle — constraint or recommended way of using or assembling the Lego, both functionally and operationally.

Reference Component Model — identification and functional arrangement of Lego parts needed to build a particular structure, showing functional interaction.

IT Node — represents an operational subassembly of Lego which can be implemented in one or more locations.

Reference Operational Model — represents a larger operational construction consisting of multiple standard sub-assemblies and placed at one or more locations or zones.
IBM’s Digital Enterprise Reference model identifies components your Enterprise may need. For example, it has many of the Technology Components essential for the cloud migration journey.

Data Services, which span the Data Lifecycle and inform the provisioning of Data services and tools.

Cognitive Services, comprised of Natural Language processing, knowledge management, and predictive analytic capabilities.

Edge Services, including caching, proxying, and load balancing, which are considered essential for effective information exchange through a Hybrid Cloud ecosystem.

Personalized User Experience layer, inclusive of web browsers, streaming and social media, mobile applications, and so on.
Reference Operational Models are used to show...

How standard IT Nodes are typically co-located and collaborate for different solution-oriented scenarios

1. The scenario begins as the customer will enter the URL of the logon page of the e-business application in the URL field of the web browser on the Client Node and press the Enter key.
2. The URL request will be forwarded to the e-business system across the Internet.
3. The request enters the system and is routed by the Edge Server Node to the Reverse Proxy Node that can service the request.
4. The Reverse Proxy Node determines that the request is for the logon page which is a Static HTML form and forwards the request to the Web Portal Node.
5. ...
Alignment within IBM needs to leverage the IBM oneArchitecture...

The reference Architectures of IBM Cloud Architecture / other relevant assets such as IT Operating Environment 2.0

IBM Cloud oneArchitecture

Aka Project Athena, Cloud NextGen, ...

IBM Cloud Architecture Center

... reference architecture

Mobile reference architecture

Big data reference architecture

Cognitive reference architecture

Blockchain reference architecture

SOA Reference model (with ITOE 2.0 extensions)

IBM TCM
Summary
Summary

Enterprise Architecture is about doing the right things right

Enterprise Architecture provides the rigor to improve holistic planning and ensure consistent design and interoperability of solutions

A key to make EA successful is to move out of the box of EA Models and Frameworks and focus on the needs of EA’s stakeholders

There is no single definition of Enterprise Architecture across the industry, most existing definitions agree about the spirit of EA. IBM’s approach to EA is consistent with this shared view. Particularly, we have a history of successful TOGAF projects with "IBM inside"

Enterprise Architecture supports strategic planning activities (upstream EA) as well as ensuring that solution projects are doing things in the right way (downstream EA)

Primary drivers for EA programs are according to Forrester agility, planning and alignment

Enterprise Architecture adds value by enabling simplification, standardization, and functionality improvements

Very often support for the EA program comes from the CIO/Head of IT and IT Operations

Enterprise Architecture enables controlled business change by providing orientation, guidance and governance through Enterprise Models and Plans
Appendix
IBM Cloud Innovate Method is the OneIBM Cloud Migration Framework moving forward.

Cloud Innovate is IBM’s solution delivery methodology built on years of cloud experience, our breadth of expertise, and industry best practices.

- Full lifecycle – from strategy to implementation
- Full stack - Addresses Applications, Infrastructure, DevOps to cover hybrid journey
- Consistency of experience from IBM ensuring predictable outcomes
- Incorporates agile approaches to increase speed to value

The methodology provides a streamlined approach to facilitate your hybrid cloud journey using predefined client demand profiles and capability patterns.
Bringing IBM Multicloud to life with some client cases

IBM Cloud Innovate: Agile method to accelerate cloud enabled transformation

- How do I stay secure?
- How do we manage issues and tickets?
- How do I monitor costs?
- How do I manage vendors?
- Can my team build the new architecture?
- How do I deal with new Multicloud issues (e.g., security, access, provisioning)?

- How do we test, learn, and deploy solutions on the cloud in an agile way?
- How do we ensure our teams have the right capabilities?

- What do I change to get the most out of my new infrastructure?
- How do I change applications, policies and processes?

- What are my assets and gaps?
- What is the business case?
- How do I convince the rest of my org?
- How do my processes change?
- How can I ensure a risk mitigating and compliant environment?

- How should I triage/rationalize my app portfolio?
- Which applications go where?
- How do I ensure continuity during the transition?
- How do I ensure safety and soundness?

- Are there apps that are best left as is?
- Are there apps we should sunset?
- How can our code be simplified for the cloud?
Five key principles define IBM’s approach

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<th>Hybrid</th>
<th>Multicloud</th>
<th>Open</th>
<th>Secure</th>
<th>Management</th>
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<td>1</td>
<td>Enable enterprises across Public, Private, and traditional environments</td>
<td>Manage other vendors’ Clouds, acknowledging the reality that client environments are heterogeneous</td>
<td>Build capabilities that are open by design, enabling client flexibility and reducing vendor “lock in”</td>
<td>Provide reliability and continuous security for the client’s environment</td>
<td>Consistent service level, support, logging, management and delivery across complete cloud environment</td>
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Accelerate your cloud journey with IBM

**IBM Cloud Adoption Transformation Briefing**

Help me define a cloud strategy for my business.

Free one day, on site strategy consultation for C-level audiences.

**IBM Cloud Design Thinking Workshop**

I want to build the next great app or experience.

Innovate & create inspiring experiences with significant outcomes, super-fast.

**IBM Migration Factory**

What should I move first, and what is the value?

Schedule a no cost, 30-minute call with a cloud migration expert.

**IBM Cloud Transformation Advisor**

I’d like to try the cloud operating environment

Free one week, hosted trial with free transformation advisor tool.

**IBM Cloud Garage Workshops**

I’d like help modernizing my application.

Free 2-4 hour remote IBM Cloud Garage consultation with Garage Experts.

For more information visit: [https://www.ibm.com/cloud/why-ibm/](https://www.ibm.com/cloud/why-ibm/)
Thank you

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