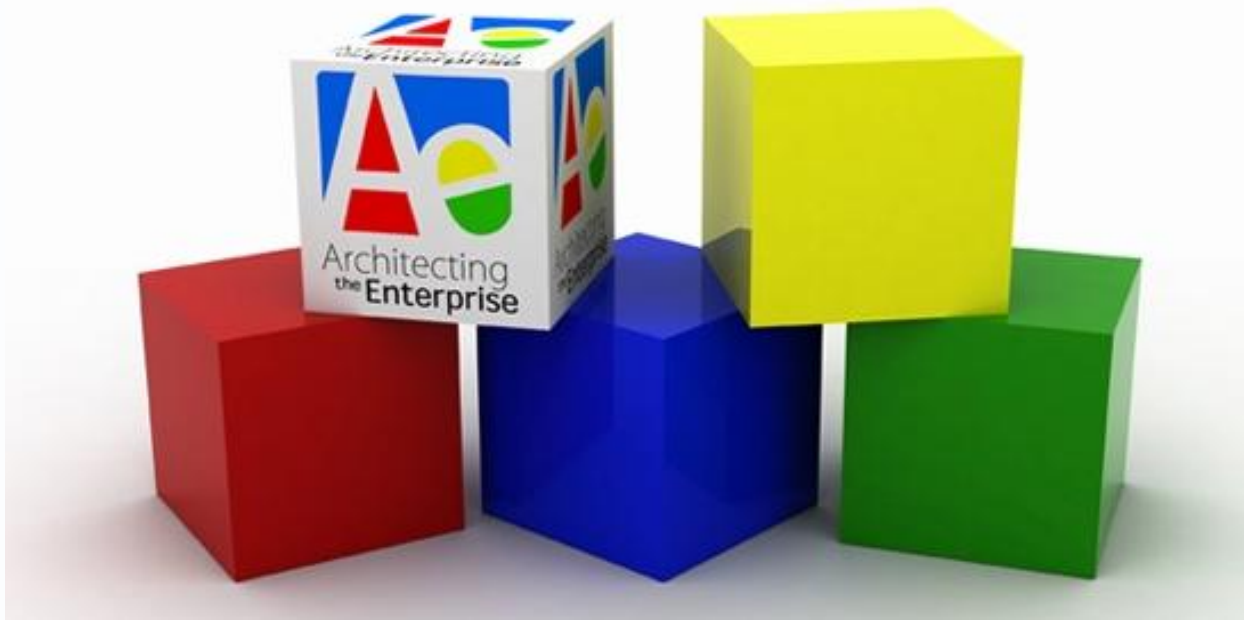# Solution Architecture and TOGAF 9

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Agenda

► What is a Solution Architect?

► What is the market demanding?

► Solution Architecture and the ADM

  ► Phases E, F, G

► What does TOGAF 9 says!

► Specific skills for a Solution Architect?

► Conclusions

Observations

► Quite often people wonder where a Solution Architect fits within the TOGAF Framework and if he is part of not of the Enterprise Architecture team

► TOGAF 9 does not totally address that role

► There is no obviously a single answer!

► Most major IT vendors have roles called Solution Architect but with little apparent agreement to what that role is

► Based on several job positions from key IT vendors and various discussions with these profiles, still we can identify some common skills described in the next slides

Solution Architect job description

► Strategic Business Acumen

- Business requirements

- Business strategy

► Products

- Shape the evolution of company's products

► Works with major lines of Business

- With the Business Analysts to document /refine requirements (functional and non-functional)

► Best Practices

► Methodologies and Frameworks

► Enterprise Architecture

- Member of the EA team

- Understand Patterns

- Mapping of product requirements and Business Problems to re-usable end-to-end technology solutions

► Data Architecture

- Data models

► Application Architecture

- Build and deploys new functionality and extend applications

Solution Architect job description

► Risk Management
  - Technical
  - Risks mitigations strategies

► Resource Management
  - Identifies teams needed based on the proposed solutions

► Project Management
  - Works with the Project Managers and Business Analysts to develop high level project schedule resource plans for the project, and project costs

- Prepares the development of the application by evaluating and selecting the development methodologies and tools (e.g. SDLC, Scrum, XP, RUP etc.)

► Compliance understanding

► Communication

► Negotiation

Solution Architect job description

► Development

- Works with the IT development team
- Driving the solution development by guiding and mentoring the team through the entire development process
- Advising when technically challenging areas

► Software Architecture

- Understand and contribute to all design needed for the solution (Business, Data, Application, Technology)

► Modelling

- Use cases
- High-level models that guide Solution Architecture design
- High-level component model

► Coding

- Build and code prototypes

► Development tools

► Hands-on experience

► Document solution design and how they interact with the larger Enterprise Architecture including Commercial Off The Shelf (COTS)

Solution Architect job description

► Experience in :

- the .NET platform, Java, Open Source (or any other environment)
- Web services
- Multithreaded programming, designing and building frameworks
- SQL design and development

► Technical Analysis

► Technical Knowledge

► Technical Leadership

- Trusted technical advisor

► Technology

- Databases
- Cloud
- SOA
- UI
- Integration

► Performance and load testing

- Database tuning
- Availability
- Scalability

Observations

► Many skills required!

   ► Business strategy

   ► Products

   ► Methodologies and Frameworks

   ► Enterprise Architecture

   ► Development

   ► Software and coding

   ► Tools

   ► Technologies

   ► Leadership

   ► Team Management
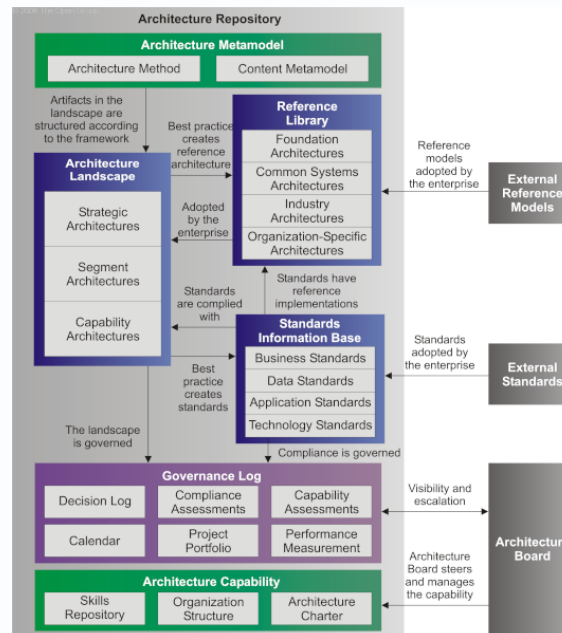
   ► Project management

   ► Governance

   ► And more!!!!

► Let's us refer first to some definitions :

► **Building Block** – A (potentially re-usable) component of business, IT or architectural capability

- Architecture Building Block (ABB)
  - A constituent of the architecture model that describes a single aspect of the overall model
  - Describe required capability
  - Shape the specification of SBBs
- Solutions Building Block (SBB)
  - Represents components that will be used to implement the required capability
  - A candidate physical solution for an Architecture Building Block (ABB); e.g., a Commercial Off-The-Shelf (COTS) package that is a component of the Acquirer view of the architecture

Architecture Building Blocks (ABBs)

► All ABBs will be stored in the Architecture Landscape of the Architecture Repository. These ABBs will have different levels of granularity to suit different architectural objectives.

The Architecture Definition Document which describes an architecture will contain all artifacts describing as views the building blocks.
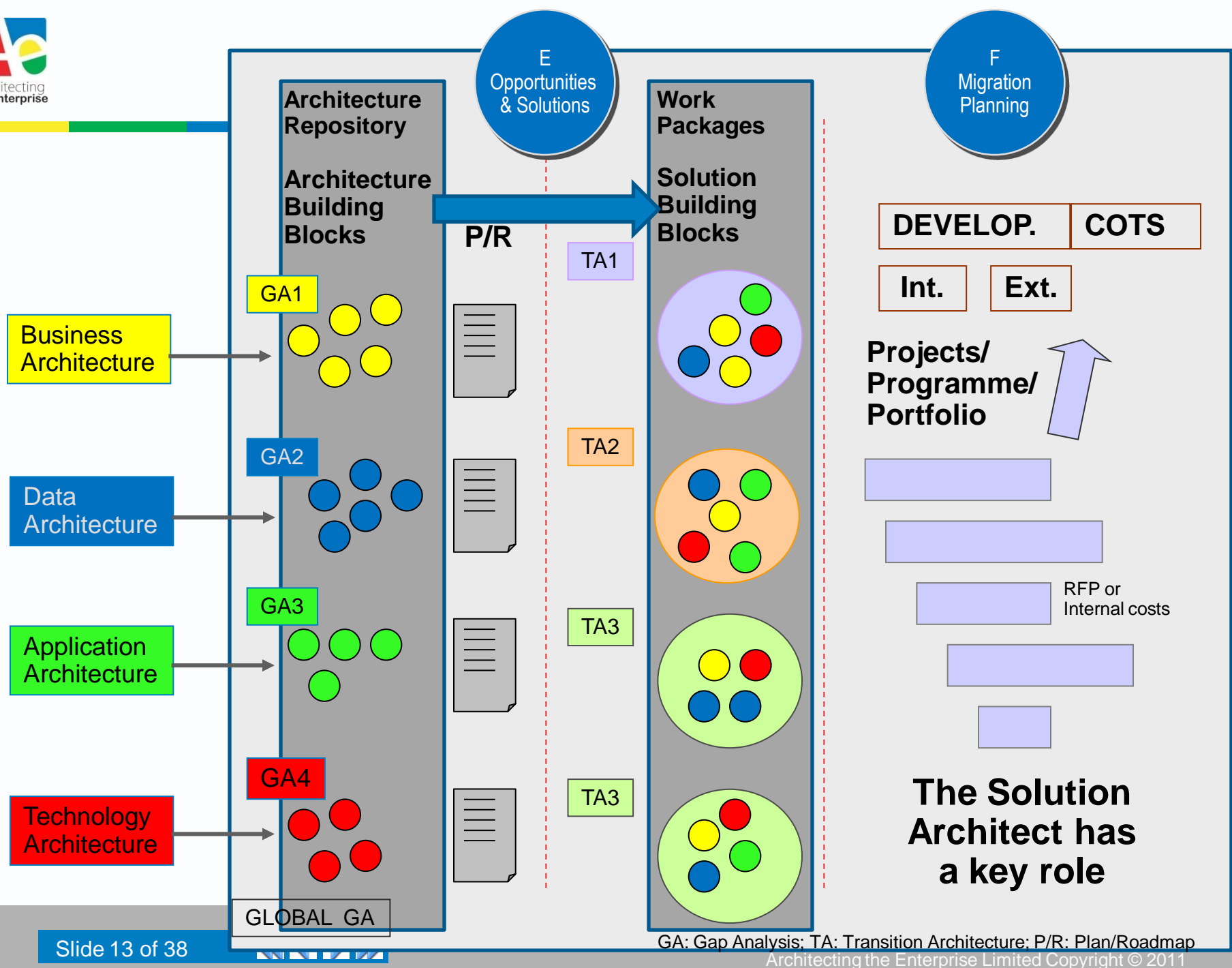
► During the Phase E

   ► we identify work packages

   ► group them into projects

   ► consolidate the gap analysis results from phases B to D

   ► identify the building blocks to be developed or acquired reusing the existing ones (stored in the Architecture Repository) as much as we can

   ► From there, we identify the SBBs which could potentially address one or more gaps and their associated ABBs.

   ► Existing SBBs have obviously also to be considered taking the interoperability requirements and dependencies into consideration.

▶ The Solution Architect has a key role in this phase as (s)he will probably be the best qualified to identify the appropriate SBBs

▶ He or she

  ▶ participates in the definition of any Transition Architectures

  ▶ identifies potential solutions

  ▶ and helps to formulate a high-level implementation and migration strategy

GA: Gap Analysis; TA: Transition Architecture; P/R: Plan/Roadmap

► During the phase F, the Solution Architect also has an important mission to ensure that the SBBs are properly designed or that acquired solutions support business requirements

► The Solution Architect may work closely with the vendor if a COTS solution is considered

► A solution includes the hardware, software, the supporting people and documentation to solve a problem

"The gaps in the existing enterprise solutions framework need to be identified and the specific Solution Building Blocks (SBBs) required to fill these gaps will be the identified by the solutions architects. These SBBs may have a one-to-one or many-to-one relationship with the projects. The solutions architects need to define exactly how this will be done. There may be other projects working on these same capabilities and the solutions architects need to ensure that they can leverage best value from these investments."

Source: TOGAF 9 (15.4.1)

► A Solution Architecture typically applies to a single project or project release, assisting in the translation of requirements into a solution vision, high level business and/or IT system specifications and a portfolio of implementation tasks

► Solution Architecture starts with an understanding of the problem, which should be documented in the Phase A with a Business Scenario, and this is where so many projects fail

► Too many people have the idea that solving a problem is all about coding!

▶ The Solution Architect is a **member of the Enterprise Architecture team but also becomes a member of the Development team**.

▶ His has a mixed role, as he is the bridge between concept and implementation

▶ The Solution Architect will operate primarily at **Segment and Capability Architecture levels** and not at the Strategic Architecture level (at the level of the Enterprise),
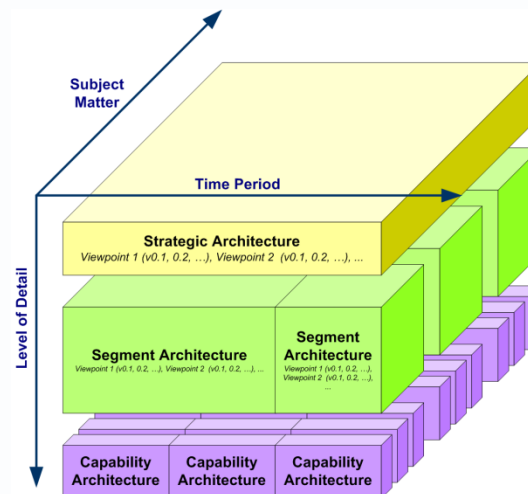
"The Solution Architect has the responsibility for architectural design and documentation at a system or subsystem level, such as management or security. A Solution Architect may shield the Enterprise/Segment Architect from the unnecessary details of the systems, products, and/or technologies. The focus of the Solution Architect is on system technology solutions; for example, a component of a solution such as enterprise data warehousing."

Source TOGAF 9 (52.6.3)

▶ The objective for the Solution Architect for this phase is :

    ▶ *To formulate recommendations for each implementation project*

- Participates in assessment of solutions needs consistent with the global business strategies (RFIs, RFPs)

- Re-analyzes business practices

- Provides business analysis and documents process design of system functions and processes as identified in the phase B: Business Architecture

- Recommends application design within the development team
- Supervises and ensures quality delivery of the analysis, design, and build of the hardware, network, and common software platform components of software releases with the development team.

Phase G : Implementation Governance

- Assesses identified technologies from the phase D: Technology Architecture, and makes sure that solution options are based on the target architecture. *Note: He will be directly accountable for the acceptance of technology architecture deliverables by the client*

- Participates in the planning, development, maintenance, installation, configuration, documentation, training and implementation of new applications/solutions.

- Accountable for the documenting requirements (hardware, network, and configuration) captured during the previous ADM phases. He may also develop the engineering documentation.

- Participates in the development of functional specifications for developers related to modifying functionality, report development, outputs and interfaces

Phase G : Implementation Governance

- Works with internal customers, external consultants, IT staff and other stakeholders to refine requirements when needed

- Leads and participates in developing and facilitating end user workshops for the solution

- Supports existing applications within the company's active portfolio and extends their use where appropriate according to the gap analysis

- Coordinates and/or participates in the planning and execution of application testing

► The objective of this phase is:

  ► *To govern and manage an Architecture Contract covering the overall implementation and deployment process*

► The Solution Architect identifies if there are any issues between the architecture and the implementation organization

► The objective of this phase is to

> ► *To perform appropriate governance functions while the solution is being implemented and deployed*

► The Solution Architect will refer to existing governance best practices such as

- IT Service Management
- Project Management
- Risk Management
- Security Management
- and Audit management (for example)

▶ The objective of this phase is

    ▶ *To ensure conformance with the defined architecture by implementation projects and other projects*

▶ The Solution Architect will review ongoing implementation governance and architecture compliance for each building block

▶ Ensures Solution Architecture addresses compliance requirements such as Sarbanes-Oaxley (SOX), Health Insurance Portability and Accountability Act (HIPAA), BASEL 2/3, etc.

► The objective of this phase is

   ► *To ensure that the program of solutions is deployed successfully, as a planned program of work*

► The Solution Architect will review ongoing implementation governance and architecture compliance for each building block

► The objective of this phase is to

  ► *To ensure conformance of the deployed solution with the Target Architecture*

► The Solution Architect will support the architecture design review using a customized checklist as defined in TOGAF

► The objective of this phase is to

  ► *To mobilize supporting operations that will underpin the future working lifetime of the deployed solution*

  - Helps to monitor and supports the operations architecture for hardware, network, and common software platforms (including configuration approach, deployment, approach, and monitoring approach)

  - Supports all hardware, network, and common software platforms in Development, Production, and Operations environments. Must be aware of the status of the system in all environments, and must communicate and manage environment related risks and activities

- Supports build team by managing configuration of hardware, network, and common software platforms (like Application Servers).

- Establishes and maintains relationship with key clients with-in client IT organization

- Develops and implements plan for increasing level of technical architecture skill in program staff

- Ensures consistent implementation of technical components across release activities with the IT Service Management team if it exists (e.g. release manager)

- Identifies production infrastructure related issues in the production environment with the help of both the Service Desk and the System Management team if they exist.

- Creates and implements issue resolution plans that have to be escalated to the Enterprise Architecture team.

Observations

► In companies where the maturity is high, it would be perfectly acceptable to have the Solution Architect acting in the name of the Enterprise Architecture team and coordinate activities during the phase G

► When the solution building blocks (SBBs) are developed or integrated with other existing solutions, the Solution Architect will be working with the development team

► The Solution Architects role will be to contribute to the design, development, integration and testing of the new components. This may be considered as being the Solution Architecture activities

▶ When the Implementation Governance phase is started, the Solution Architect will also work in partnership with the procurer/acquirer in addition to the development team and/or the vendor.

▶ The diagram on the next slide is a high level representation of the Solution Architect's activities interacting with all parties involved in the architecture development and delivery
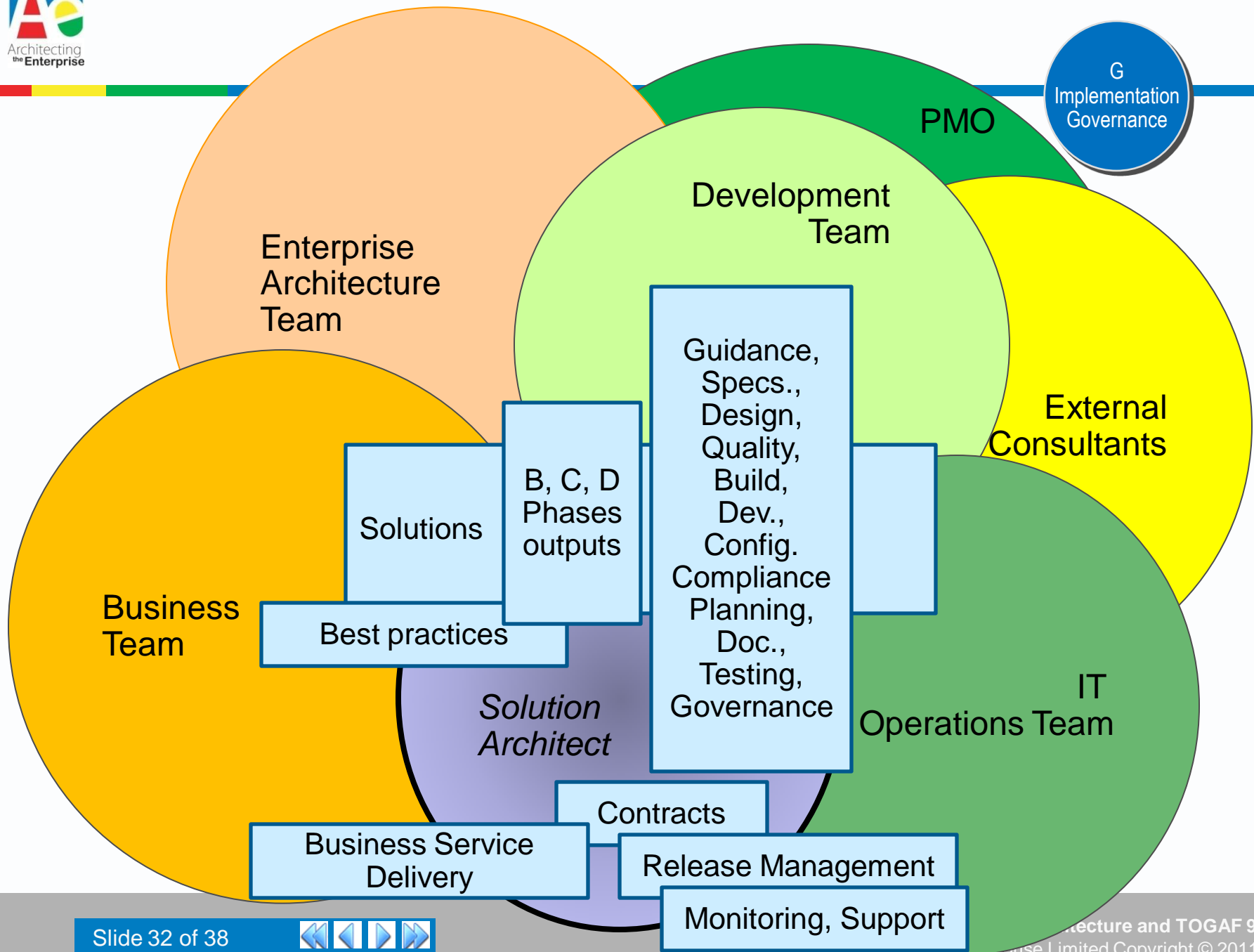
▶ In this diagram it demonstrates that many activities are led by a designated Solution Architect.

▶ The alternative being to share the role between several architects from the Enterprise Architecture team

► There is no mapping for a Solution Architect in the TOGAF Skills Framework, but below is a suggestion, based on experience and the following proficiency levels:

Level	Achievement	Description
1	Background	Not a required skill though should be able to define and manage skill if required
2	Awareness	Understands the background, issues and implications sufficiently to be able to understand how to proceed further and advise client accordingly.
3	Knowledge	Detailed knowledge of subject area and capable of providing professional advice and guidance. Ability to integrate capability into architecture design
4	Expert	Extensive and substantial practical experience and applied knowledge on the subject.

Source TOGAF9 (52.4.4)

Roles	Solution Architect		Roles	Solution Architect		Roles	Solution Architect
Generic Skills			**Business Skills & Methods**			**Enterprise Architecture Skills**	
Leadership	4		Business Case	4		Business Modeling	3
Teamwork	4		Business Scenario	4		Business Process Design	3
Inter-personnal	4		Organization	3		Role Design	3
Oral Communications	4		Business Process	3		Organisation Design	3
Written Communications	4		Strategic Planning	3		Data Design	4
Logical Analysis	4		Budget Management	3		Application Design	4
Stakeholder Management	3		Visioning	3		Systems Integration	4
Risk Management	3		Business Metrics	3		IT Industry Standards	4
			Business Culture	3		Services Design	4
			Legacy Investments	2		Architecture Principles Design	3
			Business Functions	4		Architecture Views & Viewpoints Design	3
						Building Block Design	4
						Solutions Modeling	4
						Benefits Analysis	3
						Business Interworking	3
						Systems Behavior	4
						Project Management	3

Solution Architecture the Skills Framework

Roles	Solution Architect		Roles	Solution Architect		Roles	Solution Architect
Program or Project Management Skills			**IT General Knowledge Skills**			**Technical IT Skills**	
Programs Management	3		IT Application Development Methodologies & Tools	4		Software Engineering	4
Project Management	3		Programming Languages	4		Security	4
Managing Business Change	3		Brokering Applications	4		Systems & network Management	3
Change Management	3		Information Consumer Applications	4		Transaction Processing	4
Value Management	3		Information Provider Applications	4		Location & Directory	4
			Storage Management	4		User Interface	4
			Networks	3		International Operations	3
			Web-based Services	4		Data Interchange	4
			IT Infrastructure	4		Data Management	4
			Asset Management	3		Graphics & Image	3
Roles	**Solution Architect**		Service Level Agreement	4		Operating Systems Services	4
Legal Environment			Systems	4		Network Services	3
Contract Law	2		COTS	4		Communication Infrastructure	3
Data Protection Law	3		Enterprise Continuum	4			
Procurement Law	2		Migration Planning	4			
Fraud	3		Management Utilities	4			
Commercial Law	2		Infrastructure	4			

Conclusions

► The essence of the Solution Architect role is the conversion of Business Requirements into an architecture and design that will become the blueprint for the solution being created to solve an identified business problem. The conversion is based upon the requirements and objectives of the business and guided by the strategies, design patterns, and best practices established by the Enterprise Architecture team

► The Solution Architect defines the end-to-end architecture for a project and ensures the detailed design and development remains consistent with the overall architecture of the project

► The TOGAF 9 suggested approach is related to the current situation in the market for Solutions Architects, where we see that most of their activities are limited mainly to phases E to G

► Another approach would be to consider a Solution Architect being involved in all phases of the TOGAF ADM from phase A and on-wards

धन्यवाद
Hindi

多謝
Traditional Chinese

ขอบคุณ
Thai

Спасибо
Russian

Gracias
Spanish

Thank You

شكراً
Arabic

Obrigado
Brazilian Portuguese

Danke
German

Grazie
Italian

多谢
Simplified Chinese

Merci
French

நன்றி
Tamil

감사합니다
Korean

ありがとうございました
Japanese

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