

White Paper

Is TOGAF®'s future cloudy with a slight chance of SOA?

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Louw Labuschagne CBPA®

Louw is a Managing Partner at CS Interactive Training, a specialist IT consultancy focused on providing methodology consulting, training and systems to organizations who need to build internal capacity within their Analysis, Architecture, Design, and Requirements Management environments. Louw is passionate about all aspects of information management and has had the opportunity to act as strategist, architect, speaker, trainer, analyst, modeler and developer within this field over the past 20 years.

I am currently sitting on a high-speed train, typing away at this paper on an iPad and saving it to Dropbox. This will enable me to access the MS Word document on my laptop when I am in the office and I will be able to just continue from where I stopped. My blackberry just reminded me that I have an appointment in 30 minutes; just enough time for me to quickly switch applications on my iPad and re-read the e-mail correspondence on my corporate Gmail account in preparation for my breakfast meeting with a new client.

As a consultant and owner of a small training and consulting business, cloud services changed the business landscape significantly for me. I am able to collaborate, share and co-develop with associates and clients, while travelling between cities, or even across borders, without the need of an IT support team. Cloud services also saved me the capital layout required to procure and host the hardware and software required for running a business.

Whilst I sit on the train I see most people reading e-mails on their smart phones or working on a tablet and I am wondering if a large number of business managers and corporate executives who are experiencing the flexibility of cloud services within their personal lives, are not asking why they can't have the same levels of flexibility, scalability and ease-of-use, in their business environments without having to make large capital investments?

As Enterprise Architects, are we able to help businesses re-think their approach to managing and interacting with technology in this new

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connected world? Do we have enough experienced designers, planners and architects to help with the new technology shift that is coming to a business near to you?

The end of the (IT) world as we know it

The last time I experienced a big paradigm-shift was at the beginning of my IT career as a developer on Midrange Systems. I had just completed my studies and started work as a junior programmer at a medium sized industrial organization. One of my first tasks was migrating applications from an IBM System/36 to an AS/400, which was great experience for a junior and I really enjoyed working on cutting edge business technology. My experience on Midrange hosted systems continued as I later worked on an IBM AIX RISC platform and eventually moved to HP Intel server environments running SCO and Progress 4GL.

My paradigm-shift came with the introduction of PC's into large organizations, first as an alternative to terminals, running terminal emulation and personal productivity software. Eventually the power of distributed computing became more apparent and the whole IT world started migrating to a new way of thinking about systems architecture and design.

The new way of working required me to rethink the way that I designed systems. I gained experience over the next few decades on how to evolve architectures styles that started with simple client/server architectures where a pc makes a request to a server (mostly the application logic resided on the PC and the database on the server) to N-Tier architectures, splitting the client User Interface, application business logic and data layers. With the proliferation of N-Tier architectures, businesses needed to architect the sharing of information between different N-Tier systems and Integration-Bus architectures became part of the every architect's toolbox.

Current architecture styles are all moving towards service oriented architectures (SOA) due to the need by organizations to more easily integrate disparate systems and share information not only within organizations, but also with business partners and customers. The evolution of application and data domains towards a SOA style of doing architecture was a natural progression and IT departments and developers adopted the style very quickly, but the adoption of SOA as an architecture style is only now becoming predominant within the business domain.

With the update of The Open Group Architecture Framework (TOGAF) to version 9.1, the most important change for me was the updates to the chapter on Service Oriented Architectures.



TIP: You can read the chapter on SOA within TOGAF 9.1 online at: <http://pubs.opengroup.org/architecture/togaf9-doc/arch/chap22.html>.

Building Enterprise-Class SOA Architectures with TOGAF The TOGAF 9.1 Architecture Development Method (ADM) consists of major phases that are decomposed into main steps that are further decomposed into architecture activities.

The 10 architecture phases of the ADM are depicted in the figure below are used to guide the development and management of Enterprise Architecture initiatives within an organization:

- The Preliminary phase is not executed as part of every architecture project, but is used to establish and maintain the architecture capability within the organization.
- Phase A to Phase E are the main parts of the Architecture development project executed by a core architecture team.
- Phase F is a multi-disciplinary phase where the architecture implementation projects are planned and transition architectures defined.
- Phase G & H are not architecture development phases, but contain steps that must be used to govern the implementation project teams and operational staff.

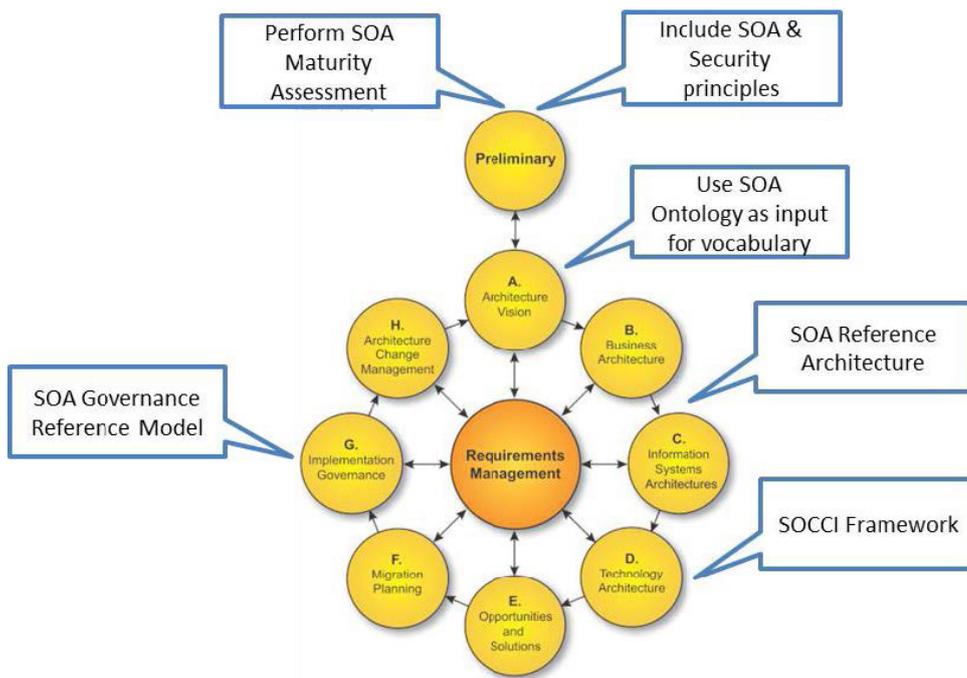


Figure 1: TOGAF Architecture Development Method

The Open Group's SOA workgroup published a set of technical standards that are very useful to architects who need to adopt an Enterprise wide Service Oriented Architecture style. The Key standards listed below are highlighted on the figure above and are aligned to the most applicable phases of the TOGAF ADM.

SOA maturity assessment using OSIMM

The Open Group SOA Integration Maturity Model is a great tool to use to understand the level of maturity of the organization and is also now an ISO/IEC standard (16680).

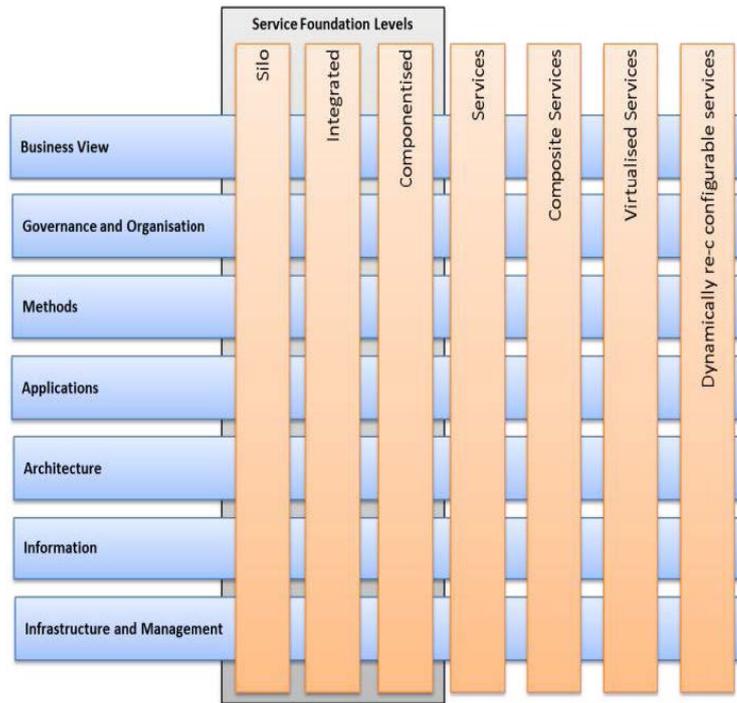


Figure 2: OSIMM Maturity Matrix

It is important to determine the maturity of the organization during the Preliminary phase of TOGAF to ensure that the style of architecture is appropriate for the organization.

The OSIMM model measures 7 dimensions, from Business and organizational to information and infrastructure management, covering all the TOGAF architectural domains. The maturity levels are also measured from 1 to 7, with the first 3 levels forming the foundation that must be in place before the organization should attempt a full service oriented architecture approach.

See the tip at the end of this section for a link to the complete OSIMM model.

Security principles for Cloud and SOA

In Chapter 23 of the TOGAF 9.1 standard a list of example architecture principles are provided to guide the architecture team in developing a set of principles for their individual organizations. With the migration to a more service oriented approach, the organization is exposed to other

potential risks that must be mitigated and managed that are not covered by the core set of principles provided.

In December of 2011 the Open Group published a paper “Security Principles for Cloud and SOA” (<https://www2.opengroup.org/ogsys/jsp/publications/PublicationDetails.jsp?publicationid=12511>), which includes a list of additional architecture principles specifically for organizations who are adopting SOA. The white paper presents the principles in exactly the same format as those in the TOGAF 9.1 standard and is a great addition to any architect’s toolbox.

SOA Reference Architecture

The SOA reference architecture, available as part of the SOA Source book version 2, is the best reference to use, in conjunction with OSIMM, to build or evaluate SOA architectures within an organization.

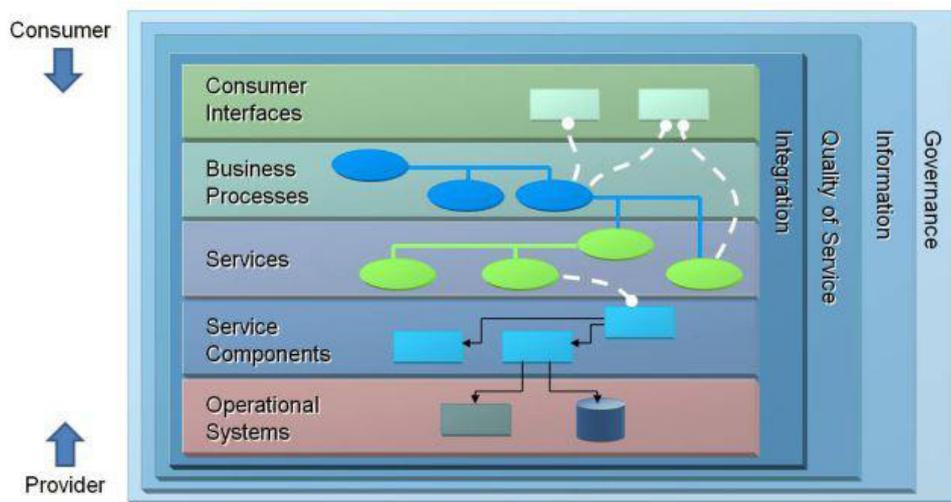


Figure 3: Logical Solution View of the SOA RA (source: SOA Source book ver. 2)

SOA Governance Reference Model

SOA has moved beyond the IT department and application integration services. When an organization adopts

the SOA style of architecture a major concern is to ensure that the principles and designs are implemented and managed correctly.

Failure to comply with the SOA architecture can erode all the benefits of adopting SOA in the first place, making the implementation of a good SOA Governance Model essential. The SOA Governance Reference Model (SGRM) created by the Open Group’s SOA Workgroup is a key standard that can form the basis of an organizational specific governance model. It includes principles, processes, artefacts, roles and responsibilities required to implement proper governance by using the SOA Governance Vitality Method (SGVM).

The complete SOA Governance Technical Standard is also available as part of the SOA Source Book.



TIP: Visit the Open Group's SOA workgroup website and view the SOA Source Book at: <http://www.opengroup.org/soa/source-book/intro/> for a good introduction to Enterprise SOA and all the technical standards highlighted in this section.

A brave new (IT) world

One standard that I neglected to discuss in the previous SOA standards section was the Service Oriented Infrastructure, the little bubble on the TOGAF ADM diagram that is labelled SOCCI. The reason for this is that I believe the Service Oriented Cloud-Computing Infrastructure (SOCCI) Framework Technical Standard is moving us closer to the next paradigm-shift within the business and IT worlds.

Cloud computing has been on the Gartner hype curve for a while and SOA has been declared dead a few times, but the impact of what it means to use SOA and Cloud-Computing is only now becoming clear. In short, Business managers do not want to manage infrastructure or technology components, they want to manage **the business!**

Before the previous paradigm-shift, when PC's were still only a hobby and before accountants discovered that MS Excel is a superior ERP to SAP, business executives did not have to "manage IT".

The PC era

I can still remember the excitement of being part of a project where we migrated off the mainframe onto a N-Tier environment with a Clustered Database server, Microsoft Application servers and PC's running a custom developed Visual Basic 5 Client. I also remember the confusion of business managers trying to understand why they have to pay so many different hardware and software vendors after paying several million for the business application, they only wanted the business software, the rest is just overhead to them.

The reason for the confusion became apparent only later when I discussed the migration with one of the managers. While running the mainframe he only received 1 invoice from the data bureau hosting their core system. The invoice detailed processing time, user sessions, data storage, maintenance costs and a few other line items, enabling him to manage his budget effectively.

The PC (and distributed computing) brought a revolution into the business environment, by distributing processing power across the organization and opening-up possibilities for business divisions to innovate and provide new services, but with the benefits we have also inherited the complexity that accompanies it.

The size of today's information technology departments is a testament to this.

Cloud-Computing

The rapid growth of smart phones, tablets and other end-user devices coupled with changes in work patterns are putting more pressure on organizations to have business applications available in a format which doesn't lock today's knowledge worker into only using a PC.

I want to read my mail on my phone, iPad or laptop; I want to share documents between my devices and I want to be able to collaborate with key partners outside my organization by sharing selected documents. I also want to provide a Learning Management System service to different clients and I want to scale up resources towards the peak training season, but I don't want to invest thousands in buying hardware that will be idle or underutilised for most of the month. I also don't want to add to my salary bill by employing a specialist IT guy to manage 3 servers for only 2 hours a day.

If these are the basic requirements of a frustrated small business owner, what are happening within large enterprises?

The SOCCI Framework Technical Standard

The Service Oriented Cloud-Computing Infrastructure Technical Standard defines the principles, SOCCI elements, building blocks and viewpoints for Service Oriented Infrastructure for the Cloud. The SOCCI standard contains Architecture Building Blocks that can be used by Enterprise Architects when developing new cloud based solutions, ensuring the cloud based solutions are addressing the needs of business.

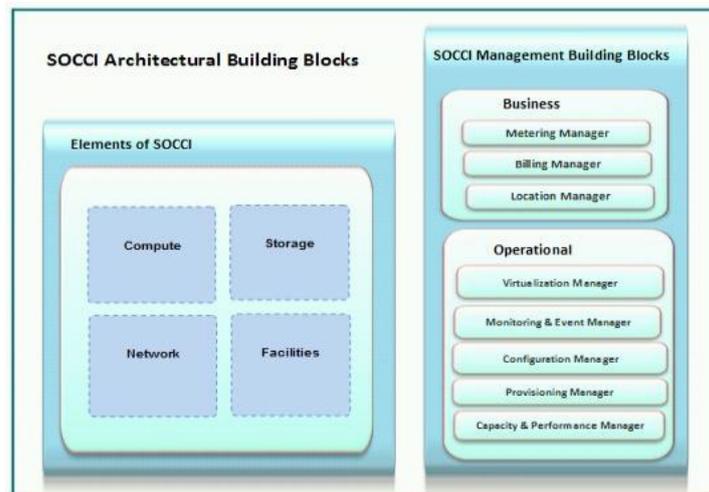


Figure 4: SOCCI Building Blocks

Conclusion

As a final point, I believe that Enterprise Architects can have a significant impact on businesses if they embrace SOA and Cloud-Computing as the new IT paradigm and design architectures to leverage this to the full benefit of the businesses.

This is the second major readjustment I had to make in my career and this time around I am in the fortunate position to see it coming and am geared to leverage my experience gained with TOGAF and combine it with new SOA and Cloud standards to the benefit of myself and my clients.



Figure 5: Is Cloud Computing the next paradigm-shift?

Are you doing the same?



TIP: A great resource for those who need to start on their Cloud computing journey is the ACM Cloud Techpack <http://techpack.acm.org/cloud/>

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Orbus Software

3rd Floor
111 Buckingham Palace Road
London
SW1W 0SR
United Kingdom

+44 (0) 870 991 1851
enquiries@orbussoftware.com
www.orbussoftware.com

