

## Technical Architecture Role Explained

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**Abstract.** This paper is an attempt to place the role of technical architecture in its inherently complicated context of the enterprise, with applicability for the technology infrastructure of the investment banking (IB) industry. Investment banks build, buy and reuse technology with the intention to addressing their business and organizational needs, challenges and for competitive advantage. However, depending on the approach not all efforts improve but the platform and instead in some instances lead instead to complications and complexities which tend to result in consuming more resources at all levels. Some IB organizations have adopted various technical architecture approaches to address the challenges posed by technology deployment. As a function and role technical architecture is intended to address all of these aspects, from strategic planning to development and implementation of technology infrastructures. The technical architecture role and approach needs to be understood as a determining factor which, when used correctly, facilitates and enables the prioritization of analysis, development and implementation, which are meant to build and execute the business requirements and vision. The paper presents an approach to the way the role of the Technical Architect should be understood as well as a possible Model which may be used as a consistent approach that IB's could employ to build, maintain, and apply technical architecture.

**Keywords:** management, technical architecture, architect role, investment banking

### 1. Introduction

In the context of the massive development of the investment banking business over the past two decades, a significant focus has been placed on improving the information technology (IT) systems as a means to facilitate business strategies and operations. This context includes bridging the gap between IT and the business towards the goal of offering pragmatic solutions utilizing the ability of employing various technologies in terms of addressing the relevant business needs. To that end studies including Kilpeläinen (2007) argue that the role of technical solutions is to support business objectives and operations. While it is important to observe that there has been improvement in some areas such as systems development, project management and technology deployment (Zachman, 1996), at the same time we can notice that the complex mix of merging technology and business spaces continues. Organizations still find it difficult to realize and comprehend returns on their IT investments. It may be said that so far none of these efforts seem to have completely resolved the challenge of meeting the organization's needs in a timely manner while ensuring the expected value is extracted from investments in IT infrastructures. Most of these challenges may be attributed to complexities inherent such systems which attempt to reach many areas and tend to become hard to comprehend develop and maintain (Armour et al, 2007). Many organizations have, as a result, sought solutions through the deployment of technical architecture linked approaches. In the course of implementing these efforts what such institutions, including IB's, find is that a determinant factor in the success of the technical architecture objectives is the understanding between human and technical actors in the process. This includes the analysis, the business environment, the architecture development and implementation. According to Ross et al (2006), "an operating model is the necessary level of business process integration and standardization for delivery goods and services". One may observe that an inappropriate deployment

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may in fact increase complexity and costs while decreasing effectiveness. A good number of IB organizations have developed a technical architecture, but one can say that few have done so effectively.

It is important to insist on the point that technical architecture is a prevailing paradigm, whose purpose is question the goals, scope, processes and roles that are considered as part of the technology and business functions. Considering Patel [5], there are many challenges which need to be addressed by IT functions including planning, rapid business and environmental change. In an attempt to answer these questions and problems regarding the ways in which IT infrastructure can be used to achieve business needs, as well as gain return on investment, the business and IT units of the organization need to engage in an intensive and gradual learning experience. The business need to make an effort to develop a thorough understanding of a model which reflects on current practices and be able to acquire an understanding of the potential of technical architecture to transform how and what work is done.

The technical architecture function and approach is intended to provide the means to maintain an adaptive infrastructure through sets of principles, standards, configurations, process and governance. Patel (2002) further proposes that IT governance is affected by an organization's unique culture and working practice, and therefore should reflect its particular goals and ambitions.

## **2. Role of the Technical Architect**

In the context of the technical architecture of organizations, and specifically of investment banking organizations, where most of this work, analysis and conclusions have been based and gathered, what transpires is that the role of architect becomes determinant in the success of applying technology and specifically technical architecture to resolving business and organizational challenges. The objectives of this paper are to provide a brief introduction of the role of technical architect by using a parallel with the architect role in another domain, provide an overview of possible roles and responsibilities that a Technical Architect (TA) may undertake, explain the TA's domains of competency, present a context in which the TA can function as well as determinant success factors for the role as well as to serve as a living document molded on the requirements and adapted based on specifics of the industry, region and technology as well as business development stage specific to the investment banking context.

The intended audience of these findings is the management and architecture community and specifically the business and technology management and relevant business unit's business technologists and technical architects. The types of questions we are attempting to answer through the paper are "what type of an architect can my team make use of" or "do I have in my team someone who fits the role".

### **2.1. The Context and Development of the Architect Role**

For a bit of a parallel, the role of the technical architect is arguably a late introduction in software building, too many times coming about as an afterthought, in terms of a formal approach. In fact most often than not a senior developer is the person who takes on the role of the technical architect, mainly on smaller scale systems. Bespoke technical architect roles are coming about as a result of increasing product complexity, project size, distributed teams, high level of integration within and between different product lines and products sharing a common code base.

In this context the role of technical architecture has been created in many organizations to ensure the overall integrity and critical characteristics of systems and development process. The types of actions and responsibilities that may be included in the role of technical architect may include staying informed with latest developments to help anticipate technological evolutions; assist building durable system architectures; promote independence with regard to API/framework providers; promote a generic approach and abstraction; bridge between developers, project managers, and business experts; technological evangelization, sharp sense of communication; promote the technical directions and choices; source ideas often from a mixed culture (machine linked / Java / .NET / open source / middleware & database independent / else); and possibly most importantly *understand TA to be filling first a role instead of a job.*

### **2.2. Responsibilities and Traits of the Technical Architect**

*A software architect is responsible for creating or selecting the most appropriate building blocks for a system (or systems), such that it suits the business needs, satisfies user requirements, and achieves the desired results under given constraints.* To that end a TA may engage in a series of activities that may include but not be limited so that he or she abstracts the complexity of a system; maintains control over the architecture lifecycle; helps projects stay on course in line with the long term vision while helping to produce results early; progressively makes critical decisions; sets quantifiable objectives; works closely with executives; inspires, mentors, and encourages; fights entropy; creates and distributes tailored views of software architectures to stakeholders; and acts as an agent of change.

An interesting set of traits that are worth exploring are actually non technical at all and are in fact linked to particulars of the individual. As such it is worth considering personality and other characteristics of a TA that come into play: has excellent communication skills; is a negotiator; conveys a sense of credibility and trust; believes in his ability to perform well; as well as is patient and resilient.

### **2.3. Competencies in Demand for a Technical Architect**

In the course of observing the various approaches and ways of implementing the function and role of technical architect I have noticed that contrary to the sometimes widely held belief that a TA is meant to be a very technical person, what one finds is that while technical and business competencies are definitely one of the fundamental building blocks that are required for the role, more often than not, many other qualities and personal traits help make a success of the role and the person fulfilling it. These traits, which are very well captured in Bredemeyer (1999) and we therefore adopt them, include technology knowhow, business strategy, organizational politics, consulting and leadership. Each of these traits bring to the table what finally represents a set of unique skills that distinguishes each individual performing the role of TA and ultimately sets the stage for the scale and range of impact and success within the organization. The ways to look at these traits may be categorized in terms of what an individual “knows”, “does” or “is”.

From a technology knowhow perspective the TA should manifest a thorough understanding of the domain and relevant technologies, clearly state what technical issues are key to success as well as development methods and modelling techniques. The actual actions that the TA takes include modelling, trade-off analysis, prototype/experiment/simulate, prepare architectural documents and presentations, technology trend analysis/roadmaps as well as take a system viewpoint. To accomplish this TA needs to be creative, investigative, practical/pragmatic, insightful, tolerant of ambiguity, willing to backtrack and seek multiple solutions and be good at working at an abstract level.

From a business strategy perspective a TA should be astute in terms of your organization’s business strategy and rationale, your competition (products, strategies and processes) as well as your company’s business practices. What the TA does in this role includes to influence business strategy, translate business strategy into technical vision and strategy, understand customer and market trends and capture customer, organizational and business requirements into the architecture. As such the TA should be a visionary and manifest an entrepreneurial spirit.

From an organizational politics perspective the TA needs to know who the key players are in the organization and what they want, both business and personal. What the TA does in this context is to communicate, listen, network, influence, sell the vision and keep the vision alive, take and retake the pulse of all critical influencers of the architecture project. To achieve this the TA needs to be able to see from and sell to multiple viewpoints, be confident and articulate, be ambitious and driven, be both patient and not ( in the face of adversity), resilient, sensitive to where the power is and how it flows in your organization.

From a consulting perspective the TA needs to be a master of elicitation techniques and consulting frameworks. In this role he builds “trusted advisor” relationships, understands what the developers want and need from the architecture, helps developers see the value of the architecture and understand how to use it successfully and also helps mentor junior architects. To achieve this he needs to be committed to others’ success, be empathetic and approachable, be an effective change agent, be process savvy and also be a good mentor and teacher.

From a leadership perspective the TA will always bring to the table a very particular style which subsumes him as a person and as a result most of the knowledge he brings to the table is his emotional

intelligence abilities rather than analytical ones. Given the challenges that one faces when confronted with the question of what makes a good leader, what one may say is that some of the actions that an effective TA does as a leader includes setting the team context, make decisions, build teams and motivate. To achieve this what the TA needs to be in a position where him and others see the TA as a leader, is charismatic and credible, he believes it can and should be done and that he can lead the effort, is committed, dedicated and passionate and also that he manages to see the entire effort in a broader business and personal context.

As a corollary to these considerations what one finds is that the technology and business strategy skills form a foundation for the TA but the real challenges are in the organizational, consulting and leadership competencies. It becomes evident that as one grows in the TA role it becomes less about what one knows and more about what one is or represents.

### **3. Technical Architecture Model Implementation**

Assuming the right conceptual framework and understanding is in place in a given organization to facilitate an architectural approach to implementation we can venture into proposing and analyzing a model that can be used to implement the architectural framework. For this scope we will consider a model with four logical stages (Objectives, Business Strategy, Development and Implementation) involved in the deployment of technical architecture.

The first stage involves setting the *objectives* and in this context one of the main goals is to assist with providing a baseline of the current state of an organization's technology environment. One of the biggest challenges in managing change is gaining an accurate view of the current state and following from there to facilitate assessment of the impact of technology change on the current organizational environment and the conception of strategic alternatives for consideration. Conceptually, the primary objectives of the technical architecture are to effectively remove hardware obsolescence or vendor dependency as a requirement by re-engineering of technology artefacts, to enable information systems and to periodically review the systems in support of the organisation's needs, to ensure that the rapidly changing external and environmental trends are enforced to significantly change the business and technical environments within organisations. The technical architecture requires ongoing evaluation and iterative processes to protect the major investment in information technology and systems by keeping them current with the changing environment.

The second stage in implementing the model involves defining the requirements, which set the *business strategy*. In general, in any institution of relevant size the business units or divisions often have different requirements, often different and frequently conflicting. As a result this poses a challenge in attempting to map the requirements for the organisation's common goals. At the same time some of the stakeholders are actors in many units or divisions, thereby, causing conflict of interests. On another hand, technical actors also have an additional challenge in terms of historical shared services and infrastructure. Business strategy is the primary driver for the development and implementation of the technical architecture. As such it consists of business vision, business requirements and contextualization. This phase is primarily influenced by factors which include organisational processes and activities as well as environmental trends (Youngs, et al, 1999). The trends relate to the business of the organization as well as relevant technologies that help enable them. The business vision's purpose is to provide a clear vision of "business futures" by capturing the most important enterprise business strategies being pursued at the time (Watson, 2002). It focuses mainly on strategic thinking about the future. For the purpose of business visioning, the project team gathers strategic planning documentation from the business and extract the relevant business drivers as well as high level information and application needs. Environmental trends are considered in the process and a business vision document is prepared and verified with senior management and other stakeholders. In terms of business strategy the TA function gathers high-level requirements derived from business vision and expressed as functional statements. At this stage of the deployment, contextualization, or articulation of the organization's system into technical architecture context is performed. The context consists of the business vision and requirements of the organization, as captured at the time. The requirements are extracted into set of needs which are then used to develop the subsequent architectural products, a set of blueprints and views of the organization. Each view is expressed in terms of components, connections and constraints, which are governed by architectural model. A key feature of the approach is the conceptual mechanism that provides

traceability between views. Once the gathering of information, requirements from the business strategy is completed, the architects begin the development of the technical architecture.

The third stage involves the *development* of the technical architecture and includes four main sequential steps: gathering technical requirements, definition of the domains (technical, process and people oriented), and documentation of technologies into current-to-strategic forms and formulation of governance principles.

The fourth and final stage as well as the coronation of the efforts in of the technical architecture process involves the implementation which consists of four stages: gap analysis, migration planning; implementation planning; and project, each very important and in fact determinant for the success of the process.

As a corollary for this conceptual model, technical architecture is expected to enable rapid technology-related change in the organization's business processes and the applications that enable them. The technical architecture is dependent on the business vision of the organisation, which captures the most important business strategies being pursued at the time; the organisational requirements which consists of high-level architectural requirements, derived from business strategies, to give direction and priority; and the architecture which contains sets of principles, derived mainly from best practices and trends that are relative to, and consistent across each domain architectures area within the business strategy of the organisation.

## 4. Conclusion

As a set of overarching observations what one finds is that TA role is very challenging and at the same time a lot of what the TA role requires is not technical and one needs to be aware when considering the means to implement such roles in the organization that in a competitive and efficiency demanding environment the TA role will be challenged at multiple levels. At the same time it tends to be a good thing that the TA role is very challenging, it will be a great match for individuals who can focus on interesting and complex problems, it offers the opportunity to advance high in an organization with a continued technical focus rather than personnel or fiscal issues and offers the opportunity to make an enormous difference in the company.

The paper emphasises that it is extremely important to be aware that success in the TA role and implementation depends on a set of skills not necessarily and typically emphasized in academic education or on-the-job training but rather on a complex mix highly dependent on the person and organization.

## 5. References

- [1] Armour, S. Kaisler, J. Bitner, "Enterprise Architecture: Challenges and Implementations," HICSS, 40th Annual Hawaii International Conference, System Sciences, 2007, pp. 217 – 217.
- [2] D. Bredemeyer, R. Malan. "Role of the Software Architect", <http://www.bredemeyer.com/role.pdf>, 1999
- [3] T. Kilpeläinen, "Business Information Driven Approach for EA Development in Practice," 18th Australasian Conference on Information Systems, 2007, pp. 5-7.
- [4] G. Muller, E. Hole, Role of the Chief Architect, White Paper from Architecture Forum Meeting Norway 2007.
- [5] N. Patel, Global E-Business IT Governance: Radical Re-Directions, Proceeding of the 35th International Conference on Systems Sciences, Hawaii, 2002.
- [6] J.W. Ross, P. Weill, and D. Robertson, Enterprise Architecture as a Strategy: Creating Foundation for Business Execution, Harvard Business School Press, Boston, Massachusetts, 2006.
- [7] R. Youngs, D. Redmond-Pyle, P. Spaas, & E. Kahan. A standard for architecture description, vol. 38, no. 1, Enterprise Solutions Structure (1999)
- [8] RW. Watson, "An Enterprise Information Architecture: A Case Study for Decentralized Organizations" Proc. HICSS 33rd International Conference on System Sciences (HICSS 02), 33rd Hawaii Press, 2002, p. 7059
- [9] J.A. Zachman, Enterprise Architecture: The View Beyond 2000, Conference Proceedings, Warehouse Repository Architecture Development 7th International Users Group Conference, Technology Transfer Institute, 1996.