SATURN 2017

13th Software Engineering Institute Architecture Technology User Network Conference

Enterprise IT Architecture Assessment & Case Studies

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Presenter (s)

Siva Muthu

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- SEI SAP architects in Deloitte Consulting’s Application Architecture Capability
- Focused on practicing SEI architecture principles

Agenda

- ✓ **Architecture Assessment – What do we do**
- ✓ **Architecture Assessment Approach**
- ✓ **Case Studies**
- ✓ **Identify Leading Architecture Companies**

We performed Architecture Assessments in over 40 Industries

Why Assessments

- Architecture validation for enterprise scale software
- Failed projects
- M&A valuation
- Performance optimization

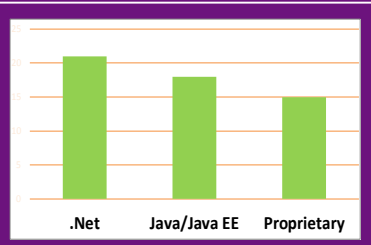
70+ Assessments in 1 Year

- State, Federal, Insurance, Health care, Manufacturing, TMT, Retail, etc.,
- Green field solutions and legacy modernization systems

Application Architecture Capability

- All Architects earned SEI SAP Certificate
- Focused on architecture services including architecture assessments and optimizations
- Goal is to drive down the cost of quality and drive up technology innovation

Multiple Technology



Our Architecture Assessment Approach

We leverage SEI's Architecture Trade-off Analysis Method (ATAM[1])

Scenario and Requirements Gathering[1]

- Brainstorm and prioritize scenarios that represent stakeholders' interest and understand quality attribute requirements

Architectural View Presentation[1]

- Present technical constraints, system interfaces, and approaches to meet quality attribute requirements

Model Building & Analysis[1]

- Select key architectural characteristics towards building a utility tree

Sensitivity And Trade off Analysis[1]

- Determine architectural decisions, risks, sensitivity points & tradeoffs

Deloitte Extension

Tools and Accelerators

A broad suite of tools and accelerators that meet recognized industry standards. This includes:

- Detailed tactics categorized by quality attributes for architecture analysis
- IT Agenda Template, Questionnaires and checklists, Scenario-based methods
- Data Request artifacts, Architecture analysis templates

Deloitte Extension

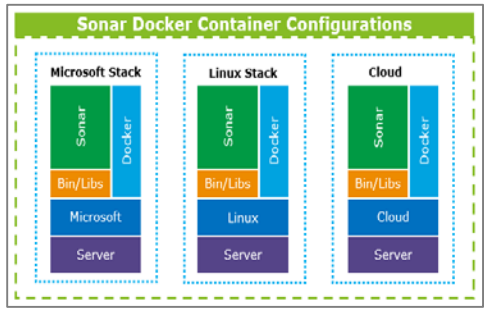
Source Code Analysis Accelerators

- Dockerized SonarQube container for automated static code analysis with several custom rule sets & quality profiles
- Targeted visual inspection to identify coding pattern inconsistencies

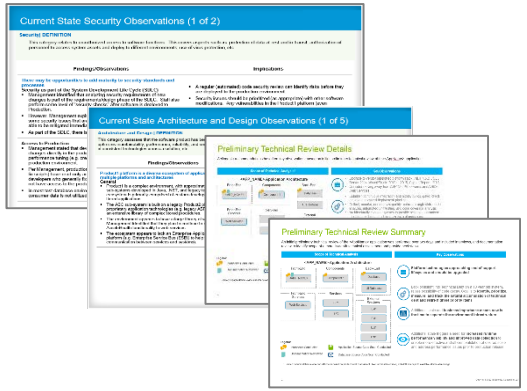
1 Software Engineering Institute (SEI) Architecture Tradeoff Assessment Model (ATAM)

Our Architecture Assessment Accelerators

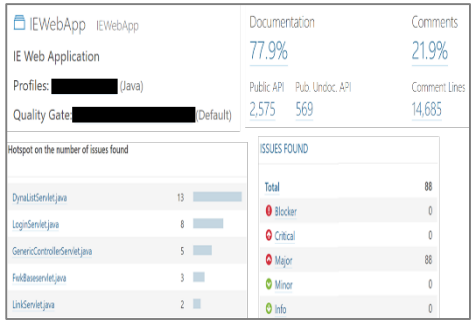
We continually develop and refine an extensive set of accelerators including interview banks, architecture guidance artifacts, a template library, reporting bundles and SonarQube rule sets



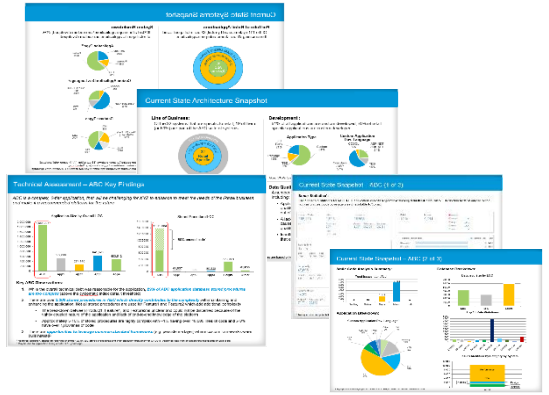
Dockerized SonarQube container to accelerate the code analysis process



Template Library that provide engineering rigor to our technical assessments



Customized SonarQube rule sets to extend SonarQube analysis based on our deep software engineering experience and best practices



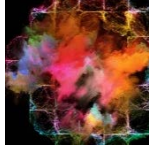
Reporting Bundles that provide custom dashboards based on leading practices over the years working with customers across industry and sector

Architecture Assessment Benefits

Assessments provide our clients an objective & independent review of their architecture based on quality attributes leading to recommendations plus a multitude of other benefits

Key Highlights:

- Risk mitigation
- Validation of roadmap
- Independent validation for quality attributes
- Objective evaluation of architecture
- Performance Optimization
- Options for corrective actions
- Conformance to architectural intent
- Code metric quality analysis
- Improved stakeholder communication



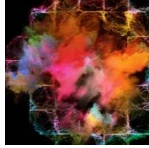
Patterns for Successful Enterprise IT

Empowered architecture team with mature practices drive success

Critical Success Factors

- Architect
- Architecture Team Structure
- Decision Governance Maturity

We classify into 3 IT models



Enterprise IT Models

Clearly defined governance, discipline, and accountability enable agile responses to changing business landscapes

Silo | DEFINITION

The practice by which architectures are managed and controlled as isolated solutions or applications based on their individual business and IT needs.

Key Highlights:

- Decisions are isolated to individual solutions or applications
- Increases heterogeneous architectures, technologies, and tools
- Deviates from enterprise business and IT strategic goals
- Increases costs and risks

Task Based | DEFINITION

The practice by which architectures are managed and controlled using a task-driven approach to evolve the architecture of the enterprise, solution, or application.

Key Highlights:

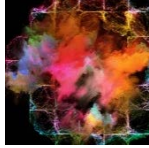
- Decisions focus on immediate architecture needs of the enterprise, solution, or application
- Eschews long-term enterprise business and IT strategic goals in favor of short-term fixes
- Responds to changing business drivers, but lack of organizational control increases risk of competing directives
- Increases long-term cost and risk across the enterprise

Governed | DEFINITION

The practice by which architectures are managed and controlled within a hierarchy of structure across multiple domains at an enterprise-wide level to ensure organization's strategic business objectives are met.

Key Highlights:

- Reduces cost and risk
- Provides discipline, rigor and transparency to managing evolution of IT supporting business strategic objectives
- Ensures business is conducted properly
- Ensures accountability to stakeholders
- Ensures effective & equitable usage of resources
- Enables agile responses to business drivers



Architecture Function Practices Observed

Organizations' Architecture functions vary in maturity from non-existent to high functioning, driving alignment to business strategy, minimizing risk and reducing costs

Level 0 - Non-Existent

- Lack of Architecture shared services programs
- Lack of any process, structure, awareness, governance models across the organization
- Lack alignment between IT and business strategy
- Architects spend time dedicated to coding, fire-fighting and troubleshooting

Level 1 – Initial/ Developing

- Efforts are ad-hoc with no institutionalized leadership
- Lack consistent strategic vision due to frequent leadership turnover
- Lack authority to hold business and IT resources accountable for strategic goals
- Treat the architect role as a singular discipline rather than a multi-disciplinary competency

Level -2 Defined

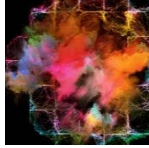
- Define standard processes and governance models
- Establish Architecture shared services programs based on organizational context
- Establish architecture meta-data repositories of reference architectures, patterns, infrastructure and re-usable assets

Level 3 – Managed

- Detail process defined, and implemented
- Products are reviewed/approved by Architects and measured against goals
- Utilize Application Architectures to realize IT cost savings through streamlining of application portfolios
- Architecture blueprints able to identify and optimize the overlapping and conflicting initiatives

Level 4 – Optimized

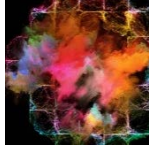
- Process refined as a result of continuous improvement and efficiently engrained throughout the organization
- Decision makers are using the architecture to identify and address ongoing /proposed IT investments
- Tracks and measures Architecture benefits or ROI on investments and adjustments are made to Architecture processes



Case Studies

A glimpse of the importance of an mature Architecture capability in an organization's ability to succeed

In the next few slides, we will examine 3 case studies about companies with a varying degrees of maturity in their Architecture practices …



Case Study 1

Lack of Architecture function has crippled business and IT relationships, led to IT services atrophy, and contributed to high cost IT project catastrophic failures

Scenario 1 – Silo | DEFINITION

Non-Existent | MATURITY

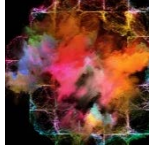
A large healthcare company with multiple complex, legacy IT systems, including 30-50 different instances of expensive mainframes plus a diverse ecosystem of smaller applications built on multiple platforms, architectures, and technologies has lead to a complex environment, manual processes, UI context switching and fragile integrations causing data quality, reporting, training and billing issues. No enterprise architecture function exists. The lack of an enterprise architecture function has crippled business and IT relationships, led to IT services atrophy, contributed to high cost IT project catastrophic failures, and a technical assessment for short-term solutions and a long-term modernization.

Scenario Highlight:

- No Enterprise Architecture (EA) Function
- No Strategy Standards and Governance
- No roadmap
- No Business aligned IT Strategy
- No use of industry standard EA tool-sets to document and manage artifacts

Implications and Challenges:

- Crippled business and IT relationships preventing strategy alignment, and eroded IT credibility
- No IT vision and roadmap alignment to business strategy to drive IT decisions, services, and products
- IT maturity is low causing inefficient use of IT assets affecting business productivity, efficiency, and billing accuracy
- Several antiquated systems patched together through fragile, unreliable integrations forcing unreliable manual processes and causing data quality issues negatively affecting billing
- Inability to modernize IT systems forcing business to run on 32+ instances of old, expensive mainframe systems



Case Study 2

Lack of Architecture function led to task based governance, singular focused decisions, a solution potentially misaligned with the enterprise vision, and ineffective use of resources increasing risk and cost

Scenario 2 – Tasked Base | DEFINITION

Developing | MATURITY

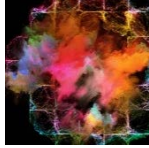
A large state employee assistance program partnered with IT vendors to release a sophisticated, high transaction volume IT system to deliver workforce benefits to the state built on .NET platform with complex internal and external system integrations. The state had no enterprise architecture function to drive vision, roadmap, and govern the solution to the enterprise. The agency leveraged a tasked based approach to govern the complex solution, assigning an individual Technical Architect. The Technical Architect provided oversight and guidance over infrastructure, overall solution, application architecture, and served as a sounding board for agency to confirm technical correctness of the vendor solution.

Scenario Highlight:

- No Enterprise Architecture (EA) Function
- Solution focused Strategy Standards and Governance
- Solution focused roadmap
- Solution focused alignment with specific line of business
- No use of industry standard EA tool-sets to document and manage artifacts

Implications and Challenges:

- Lack of state EA function forced the agency to leverage a tasked based approach to governance. Creating a silo solution potentially misaligned with the state's strategic business vision and IT roadmap
- Reliance on IT vendor to drive the solution architecture, roadmap, and help align line of business to solution
- Business and IT decisions made using a narrowly focused lens, solely from the point of view of the solution and main line of business
- Leaving out the EA lens opens the state up for insufficient use of software, licenses, infrastructure, resources, and misalignment to future business and IT strategies that could negatively affect risk and cost



Case Study 3

Governance without authority to enforce marginalizes Architecture effectiveness, strains relationships, and increases costs of insufficient IT services

Scenario 3 – Governed | DEFINITION

Defined | MATURITY

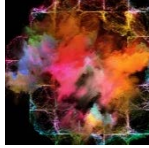
A large healthcare company with several complex legacy platforms having a diverse ecosystem of smaller applications built on multiple platforms, architectures, and technologies has lead to a complex environment with transactional issues and fragile integrations causing data quality, reporting, and billing issues. An enterprise application function exists with appropriate levels of governance but EA function lacks the authority to enforce. The lack of authority and decision making power in the enterprise architecture function led to strained business and IT relationships, increases in costs of providing insufficient IT services, and an IT Strategy assessment.

Scenario Highlight:

- Establishment of Enterprise Architecture (EA) Function
- Existence of Strategy Standards and Governance
- Existence of roadmap
- Use of industry standard EA tool-sets to document and manage artifacts

Implications and Challenges:

- No authority to enforce governance, specifically alignment to roadmap and technology
- Technical teams operate as isolated silos making own choices regarding technologies, products, and standards violating the overall technology and business strategies
- Stalled vision and roadmap evolution
- Strained communication and relationships with development teams and business
- IT maturity is medium. Several antiquated systems patched together through fragile, unreliable integrations causing data quality issues negatively affecting billing



Case Study 4

The architecture function led to reduced risk & costs through efficient use of IT resources, quality services, and culture of continuous improvement

Scenario 4 – Governed | DEFINITION

Managed | MATURITY

A large retail company with multiple complex systems processing high transaction volumes across multiple business units on diverse set of channels using ~13K internal and external IT resources evangelized the vision and strategy, drove best practices, standards, consistency, and accountability across the organization resulting in exceptional service and cost savings. The industry standard enterprise architecture function defined a roadmap aligned with business and IT strategy leading to efficient use of IT resources, quality services, and culture of continuous improvement with a reduction in risk and costs demonstrating value and justifying the cost of an EA function.

Scenario Highlight:

- Enterprise Architecture (EA) Function
- Well defined Strategy Standards and Governance
- Well defined roadmap
- Use of industry standard EA tool-sets to document and manage artifacts
- Size of organization ~3K IT professionals and ~10K vendors IT professionals

Implications and Challenges:

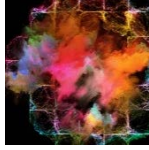
- **Reduction of cost and risk**
- Clearly defined EA organization and governance
- Culture of continuous improvement through measurement, reporting, and communication
- **IT Strategy aligned with Business Strategy**
- Appropriate level of authority to **enforce governance**
- **Increased innovation**
- Shared resources across projects to minimize waste and maximize costs

Successful Architecture Functions Employ these Practices

Architects are the trusted advisors and partners of the business to transform IT from the As-Is to the To-Be IT architecture

Key Highlights:

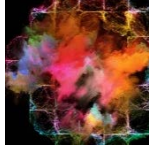
- IT led Business models
- Architects lead IT investments
- Strong emphasis on Innovation driven culture
- Establish enough governance to start, emphasize accountability, and provide proper authority to enforce
- Develop IT Strategic Roadmap aligned to Business Strategy and Vision
- Establish measurement program to quantify and track costs and risks across the organization
- Focus on “implement now, improve later” principle to quickly achieve a solid basis for continuous development



Identifying Leading Architecture Companies

A prepared company enables its established Architecture capability to succeed

In the next few slides, we will examine 3 case studies about companies with a ready and mature Enterprise IT architecture…



Leading Architecture Companies #1

The governed architecture function increased the speed of IT, drove down cost of quality and drove innovation

Company 1 – Governed | DEFINITION

Managed | MATURITY

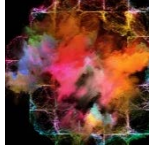
In early 2015, Company #1 decided to create a brand-new consumer-centric health plan. The new business platform would be owned by a new Consumer Business organization, provide new products to the market, base itself on a different engagement model, and apply digital-first principles and new business processes across the board -- all relying on a new technology platform.

Background:

- Historically, Company #1's Architecture organization focused primarily on enterprise value, IT interoperability, information consistency, and technology governance. Well defined Strategy Standards and Governance
- While the Architecture team had plenty of experience with business process optimization, the Consumer Business program required a more transformational approach.
- Architecture practice needed to "turn business vision into IT action" and to complete the job before Nov. 1, 2015. This deadline, which was also the beginning of Open Enrollment for 2016

Result:

- Successfully ran its first Scaled Agile Framework program, with more than 700 people involved at the height of staffing
- Integrated software from 15 different sources through more than 400 integration points
- Institutionalized a multispeed approach to IT delivery (separating systems of engagement, systems of record, and systems of insight)
- Delivered a new digital experience based on more than 40 APIs
- Established a strategic next-gen integration platform that can reliably and cost-effectively deliver large numbers of hybrid integrations



Leading Architecture Companies #2

The governed, mature architecture function drove creation of new programs to improve customer experience, foster innovation, and drive growth

Company 2 – Governed | DEFINITION

Managed | MATURITY

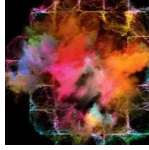
Company #2 is a top-tier provider of telephony, broadband, and video services to U.S customers. Innovation and customer experience are the key tenets the company uses to acquire and retain customers, but a combination of mergers, legacy platforms, reduced budgets, and increased scope became an obstacle to consistent service delivery.

Background:

- It's enterprise architecture group drove the creation of a program called Order to Bill Transformation to improve the user experience and to address business process evolution.
- Order to Bill Transformation became responsible for call center transformation, dispatch automation, billing modernization, and centralized business intelligence.
- Order to Bill Transformation required rethinking, analyzing, and redesigning a multitude of flows and systems across the various services that the company offers.

Result:

- Order to Bill Transformation enabled agents to sell more, increased first call resolutions, merged regional billing systems, automated scheduling and job assignment, and consolidated data to drive prospect campaigns.
- Reduced churn and improved personalization.
- The EA team will capitalize on the experience gained from the complex Order to Bill Transformation effort to develop and deliver omni-channel experience, transform mobile and self-service experiences, and drive growth through modern technologies such as big data.



Leading Architecture Companies #3

The company transformed from an immature, siloed architecture function to a mature, defined architecture function driving cost savings and innovation

Company 3 – Governed | DEFINITION

Defined | MATURITY

Company #3 is a global leader in designing, manufacturing, and servicing engines and related technologies, from fuel systems to power generators. Five accelerators were identified by its executives as strategic objectives for accelerating growth in revenue and profitability: Adopt a growth mindset, move from multinational to global, become excellent in customer support, achieve supply chain excellence, and lead in critical technologies. These accelerators require multiple transformations across the enterprise.

Background:

- Encountered challenges of global deployment, siloed processes, and limited IT lifecycle management with weak governance.
- Hampered by redundant and rigid applications, customizations and complex dependencies, multiple sources of truth, and limited skills coupled with lack of continuous training.
- Lack of enterprise-level transformation planning.

Result:

- Created an architectural foundation of frameworks, governance processes, standards, and practices to guide transformation initiatives
- Provided an enterprise information architecture; technology road maps; and a service excellence framework for enterprise integration, information, application platform, digital platform, and security service centers.
- Increased revenue from B-to-B, e-commerce, and telematics operations to cost savings from application rationalization and infrastructure simplification