ENTERPRISE ARCHITECTURE:
A FRAMEWORK FOR C2 METRICS

Jan Popkin
Senior Vice President
Agenda

• Introduction
• What is Enterprise Architecture?
• Architecture and Metrics
• Frameworks and Standards
• Metrics in a C2 Environment
Industry Perspective

My Background

• Founder & CEO of Popkin Software for 18 years
• Developer of System Architect enterprise architecture & modeling tools
• Technical background in IT and systems integration
• 70,000 users worldwide
Today’s Landscape

• Metrics for measuring the success of modeling and analysis has always been a challenge, especially in real-world C2 environments

• Ongoing Challenges
  – Lack of standards in metrics
  – Custom metrics for each project
  – Must be adapted to changing C2 environment
Enterprise Architecture & Metrics

• Enterprise architecture is a well-developed platform
• Architecture serves as a framework for the central collection and dissemination of information
  – Business processes, data flows, applications and systems
  – Relationships to mission and capabilities as well as strategies
• EA is method to collect and disseminate traceable, factual information that can be analyzed and measured
• Different sets of metrics can be applied dynamically following data collection
  – Supports meaningful analysis over time
  – Repeatable process
  – Adaptable to change
• Supports streamlined dissemination of measurements to key stakeholder groups
Platform for Metrics

- Architecture
- Frameworks
- Repository
- Standards
What is Enterprise Architecture?
Architecture Blueprint

• Architecture is the “road map” to tie together multi-vendor, multi-platform environment

• Can no longer build and deploy; must take into account emerging technologies

• Architecture documents a future mission and technology environment
  – Strategic: Investment strategy, interoperability
  – Operational: Mission and Capabilities
  – Technical: Deployment

• Deliver roadmaps that give organizations access to information to be responsive to new operating realities
Enterprise Architecture

Architecture is designed to help organizations understand relationships among missions/capabilities, business processes, data and IT infrastructure.
Enterprise Architecture

• More closely align IT to missions and capabilities
  – Critical in the C2 environment of real-world scenarios

• Agencies are placing increasing value on architecture
  – Method for gathering and distributing valuable information to internal groups so they can take action.
  – Incorporate best practices and experiences into decisions about technology investments, e-government and emerging technologies

• Architecture has a direct impact on the ability to manage resources in a time of shrinking IT budgets and increasing technological complexity
Frameworks and Standards
Frameworks

• Provides a complete checklist of the people, systems, processes and internal and external factors that contribute to making an organization function

• Serves as a basis for a common vocabulary and a common format for information capture and dissemination.

• Offers a standard approach and perspective and a similar set of work products

• Helps simplify the architecture development process into discrete, understandable pieces

• Most popular defense frameworks are the C4ISR framework and its newest evolution, the Dept. of Defense Architecture Framework (DoDAF)
Dept. of Defense Architecture Framework

- Operational View
  - People, Relationships, Data

- Systems View
  - Capabilities, Characteristics

- Technical View
  - Standards, Conventions

- Operational Systems View
Integrated View of DoDAF

Top-down: High-level visualization

Models: Data, IT, Mission

Bottom-up: Industry standard methodologies
Frameworks: Guiding Development

• Enables organizations to determine which systems and applications are tied to missions and capabilities

• Helps IT groups to understand how their processes and systems fit within the broader organization

• Frameworks are a key part of architecture design and metrics
  – Guide the technically complex process of integrating heterogeneous, multi-vendor architectures and models

• Platform for supporting development of metrics that are repeatable and can be used over time by many different groups.
Repository View of DoDAF
Repository

- Enables the gathering of all the data pieces in one place
  - Links to source documents for traceability
  - Separates the measurement from the raw data
  - Makes the relationship between the two dynamic
- Users can dynamically generate metrics that are relevant to the best practices of the organization
- Measures real-world scenarios
- Standards ensure data can be shared across the agency
- Measurements can be adjusted without affecting how the raw data is captured
- Supports dynamic framework that allows measurements to be generated and modified over time
  - Current approach is resource-intensive and static
Open Standards

• Open standards
  – Support higher degrees of interoperability and sharing
  – Offer clients across industries a broad choice of hardware and software
  – Created a "marketplace" to attract independent investment and innovation
    – Wide acceptance last 5-10 years (DoDAF, UML, BPMN)

• Net-centricity and information sharing improve enterprise wide communication and interoperability

• Part of evolution from tightly coupled applications to network-based functionality
Architecture and Metrics
Metrics in a C2 Environment

• ‘One-time’ measurements evolve into measurements that are repeatable, dynamic and able to be validated and visualized

• Metrics should provide a historical perspective and show movement over time.
  – Enable dynamic measurements based on mission, capabilities, or organizational structures

• Metrics applied against a repository of information captured over time are the most valuable.
  – Enables users to compare what has happened in the past to what may happen in the future.
  – Can measure impacts of change in ‘what if’ scenarios that can be applied historically to see evolution.
  – Enables metrics to evolve based on mission or capabilities changes.
Architecture and Metrics

• Enterprise architecture enables the development of a repository of information, from which raw data can be taken for measurement purposes.

• Organizations can view and analyze different aspects of a project's metrics to make more informed decisions about adapting to change.

• Metrics require a rigorous science as a basis
  – Based on a framework from which a set of standard measurements can be generated.
Metrics Provide Validation

• Metrics must also be validated against the real world.

• Data points need to be studied over time to verify the accuracy and depth of the metrics.
  – Ensures that the metrics are measuring what they are designed to measure.

• By correlating measurement to the real world, organizations can see what has been successful and examine the reasons for success.
  – Apply current set of metrics to validate their accuracy and completeness.

• Architecture-based metrics make this possible.
  – Information is drawn from the raw data collected according to structured guidelines of the framework.
First Step is Repository

• Metrics require a set of standard measurements

• Repository of information is **first** step in measurement because it enables
  – Collection of raw data for measurement
  – Dynamic and repeatable process
  – Process and metrics can be validated
  – Traceable sources
  – Adaptable framework

• This is both a physical ‘thing’ and conceptual process.
Metrics & Stakeholder Groups

• Different people in the organization have different perspectives on the metrics and how they should be acted upon.

• Communication of information to key stakeholder groups is critical. Must be able to disseminate and visualize the information and its meaning and impact to various stakeholder groups.

• Publishing the is a key part of the collaboration process and fosters feedback from within and outside IT.

• Enterprise architecture establishes a common platform for analysis and collaboration.
Stakeholders

STRATEGIC

MISSION AND CAPABILITIES

DEPLOYMENT
Architecture-based Metrics

• Architecture-based metrics can be easily tailored to different C2 audiences.

• Examples
  – Help IT teams develop a strategic plan that outlines future missions and capabilities
  – Assist CIOs and senior management in assessing costs for budgeting purposes.
  – Enable war-fighting projects to examine the success of current real-world scenarios against mission and capabilities.
Future of Metrics

• Next evolution of metrics: development of a standardized process for the collection and dissemination of metrics that can be:
  – Tied directly to modeled and real-time data
  – Can be easily shared throughout the organization.

• Enterprise architecture provides a framework for the collection and dissemination of information over time, using standards.
  – Helps users pinpoint changes and validate them using a dynamic, repeatable structure

• Primary benefit is the integration of measurement systems into existing architecture processes and the adoption of a more flexible, adaptable methodology for measuring and improving the success of C2 projects
Thank you.

www.telelogic.com