




Institute For
Enterprise Architecture
Developments

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Enterprise Architecture Assessment Guide



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Preface

An enterprise architecture (EA) establishes the organization-wide roadmap to achieve an organization's mission through optimal performance of its core business processes within an efficient information technology (IT) environment. Simply stated, enterprise architectures are "blueprints" for systematically and completely defining an organization's current (baseline) or desired (target) environment. Enterprise architectures are essential for evolving information systems and developing new systems that optimize their mission value. This is accomplished in logical or business terms (e.g., mission, business functions, information flows, and systems environments) and technical terms (e.g., software, hardware, communications), and includes a transition plan for transitioning from the baseline environment to the target environment.

If defined, maintained, and implemented effectively, these blueprints assist in optimizing the interdependencies and interrelationships among the business operations of the enterprise and the underlying IT that support these operations. It has shown that without a complete and enforced EA (Strategic) Business Units of the enterprise run the risk of buying and building systems that are duplicative, incompatible, and unnecessarily costly to maintain and interface.

For EAs to be useful and provide business value, their development, maintenance, and implementation should be managed effectively and supported by tools. This step-by-step process guide is intended to assist in defining, maintaining, and implementing EAs by providing a disciplined and rigorous approach to EA life cycle management. It describes major EA program management areas, beginning with:

1. suggested organizational structure and management controls
2. a process for development of a baseline and target architecture,
3. development of a transition plan.

The guide is especially focusing on the Assessment of Enterprise Architecture's.

Conclusion

The items described in this guide addresses the Enterprise Architecture Score Card approach.

An electronic version of this guide can be ordered at the following Internet address:
<http://www/enterprise-architecture.info>

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Credits

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1. Introduction

Today the area of (enterprise) architecture in the virtual digital world will become more and more full-grown. So the focus is changing to the quality of the work of enterprise architects. How can we review the results of the work of (enterprise) architects and how can we review their process. Can we define quality criteria to validate the products and results from other architects?

This document describes the main line of a methodology / approach in use by several organizations to review the activities and results of enterprise architects.

This document is version 2.2 of this approach and will be continuously refined based on practical experience.

The effect of knowing that the results will be reviewed is that enterprise architects are taking more time and effort to implement and manage their enterprise architecture processes effectively as well as the take more attention to the quality of their results and decision-making.

The approach developed by Jaap Schekkerman is called the "Enterprise Architecture Score Card TM"

The attention for the quality of architecture work is growing, by the fact that the impact of enterprise architecture on organizations and technology is growing.

So how to measure that an enterprise architecture is 'good' given a certain situation and supporting well described goals and objectives.

So the question is when is an Enterprise Architecture Good Enough?

An Enterprise Architect knows he has achieved the perfect solution not when there is nothing left to add, but when there is, nothing left to take away. [Saint-Exupery]¹

'Good' in this context is a relative idea.

Before we can review an enterprise architecture, we have to define the Criteria how to review the enterprise architecture. These Criteria have a strong dependency of the goals and objectives of what has to be achieved with that enterprise architecture. So the first activity before starting an enterprise architecture study is to define these criteria.

The term enterprise architecture products used in the context of this document means all results produced by enterprise architects as a result of their activities, supporting the goals and objectives of that architecture study.

¹ From the Book, 'How to survive in the jungle of Enterprise Architecture Frameworks'; Publisher Trafford; ISBN 141201606-X; Author: J. Schekkerman; <http://www.enterprise-architecture.info>



2. Goals and objectives of the Enterprise Architecture

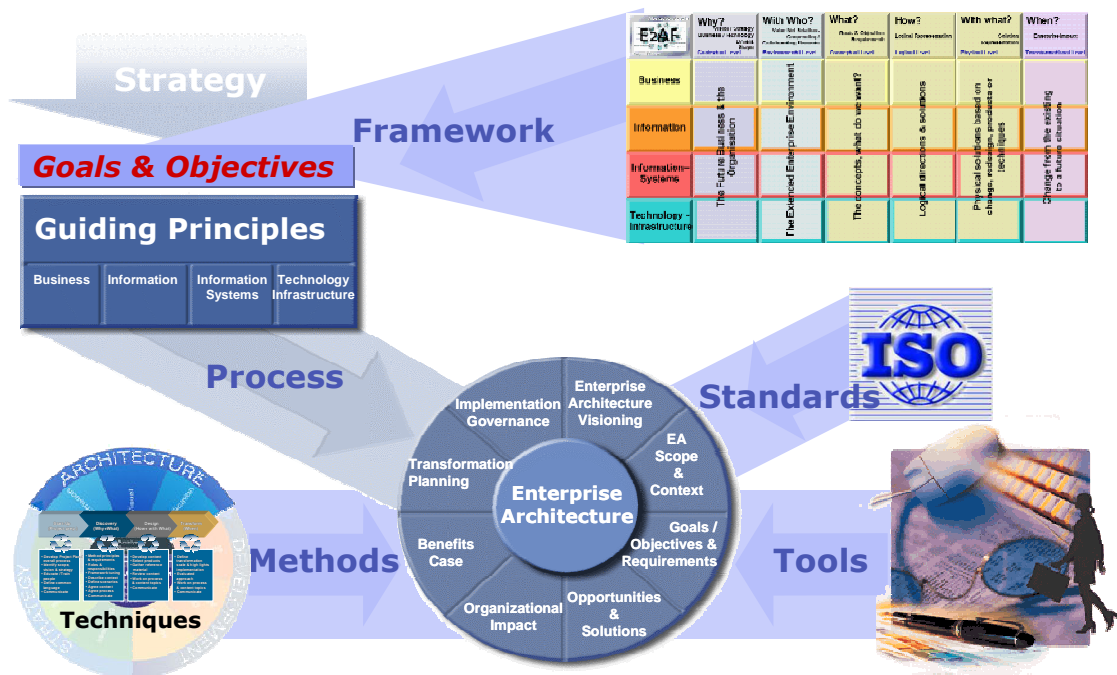
To support an organizations goals and objectives, the EA program model can help us to understand the relations and elements that influence the decision-making about the adoption of enterprise architecture concepts in several ways.

2.1. Enterprise Architecture Program

Enterprise Architecture provides a mechanism that enables communication about the essential elements and functioning of the enterprise.

It yields centralized, stable, and consistent information about the enterprise environment. In an insurance company, for example, an EA would help executives pinpoint the companies more lucrative markets, understand how well the company's current resources are meeting customer needs in those locations, and determine what kind of systems might be needed to improve services.

This EA program addresses at a holistic way the elements of strategy, frameworks, the overall EA process, methods & techniques, standards and tools.



This model is focused on the goals & objectives and shows the influencing elements of an enterprise in such a way that the mission of an organization is the major driving force and the environment and the stakeholders are the influencing variables of the system. The enterprise architecture lifecycle show the different elements compassing the life cycle.

There are tremendous rewards for organizations that are able to harness the vast array of available options into a holistic EA framework of flexible domains and supportive technology that meet the rapidly evolving needs of their stakeholder



communities. Enterprise Architecture process and framework must effectively align business & IT resources and processes that they enable.

Developing a system based on the EA results is asking modeling methods that comply with the system development environment. Supporting decision-making is asking other type of modeling methods and techniques.

So, besides the choices for an EA framework at the same time choices for supporting methods and techniques has to be made.

The decisions related to strategy, business goals, information needs, data mapping, selection of product- independent systems, and selection of specific hardware and software need to be guided by this framework to ensure maximal effectiveness and efficiency.

Unfortunately, while most Enterprise Architecture frameworks and processes are able to generate reasonably good descriptive enterprise architecture models, they do not create actionable, extended enterprise architectures that address today's rapidly evolving complex collaborative environments.



3. Enterprise Architecture Score Card™²

The Enterprise Architecture Score Card is based on a methodological approach for the different enterprise architecture results of different enterprise architecture process steps.

Based on predefined criteria for all aspect areas, the process steps and results can be reviewed. Before explaining more in detail the Enterprise Architecture Score Card approach, the enterprise architecture approach will be explained.

The Extended Enterprise Architecture Framework (E2A)TM is a clear concept with powerful implications. By understanding any particular aspect of an organisation at any point in its evolution, enterprise architects construct results that can be very useful in making decisions about changes or extensions.

The framework contains 4 rows and 6 columns yielding 24 unique cells or aspect levels.

Abstraction Levels Aspect Areas	Why? Vision / Strategy Business / Technology Drivers Scope Contextual Level	With Who? Value Net Relations Cooperating / Collaborating Elements Environmental Level	What? Goals & Objectives Requirements Conceptual Level	How? Logical Representation Logical Level	With what? Solution Representation Physical Level	When? Enterprise Impact Transformational Level
Business	Business Goals, Drivers and Concepts <ul style="list-style-type: none"> Corporate Strategic Plans Extended Business Drivers Extended Guiding Principles Scope of Collaboration Environmental Dynamics, e.g. Laws Business Goals & Objectives, KPI's Viewpoints = Competition, Value Net, etc. End/Means = As-Is / To-Be Business Situation 	Extended Enterprise Value Net <ul style="list-style-type: none"> Collaborative Value Parties Scope of the Collaborative value Collaboration Contracts, Service Levels Law & Regulations Collaborative Business Goals & Objectives Viewpoint = Collaborative Value, etc. End/Means = As-Is / To-Be Collaborative Environment 	Level of Business Collaboration <ul style="list-style-type: none"> Program Goals & Objectives Business Requirements Business Relationships Budget of Change Stakeholders / Win-Win Conditions Quality of Services Characteristics = Time, Flexibility, Availability, Security, Maintainability, etc. End = Business Purpose 	Type of Business Collaboration <ul style="list-style-type: none"> Organization Structure Business Area Structure Role Players / Actors Value Net Position Business Culture Business Commitment Business Rules Viewpoint = Business Perspective End = Business Behaviour 	Solutions of Business Collaboration <ul style="list-style-type: none"> Business Functions structure and relations Business Tasks / Activities Business Objects Business Resources Business Knowledge Business Benefits Technology Possibilities End = Business Outcomes / Business Solutions 	Granularity of Change <ul style="list-style-type: none"> Enterprise Business Case Enterprise Transformation Roadmap Enterprise Priority Plan Enterprise Governance Plan Enterprise Budget Plan e.g. Business Process Redesign or Outsourcing End = Enterprise Business Transformation
Information	Activities the Business Performs <ul style="list-style-type: none"> Enterprise Information Policy Responsibilities & Competencies Ownership of Information Internal / External Dependencies Internal / External Activities in Scope Activities = Generic or Specific Activities = Critical / Overhead End = Information Situation 	Extended Enterprise Information Exchange <ul style="list-style-type: none"> Extended Information Exchange Services Extended Information Ownership Parties Information Confidentiality Extended Dependencies Activities out of Scope Information = Generic or Specific Information = Critical / Overhead End = Ext. Enterprise Information Exchange 	Level of Information Interaction <ul style="list-style-type: none"> Functional Requirements Non-Functional Requirements Quality of Services Information Relations Information Characteristics Policy = Business Purpose Domains = Functional Areas IP = Business Resources End = Information Resources 	Type of Information Interaction <ul style="list-style-type: none"> Information Tasks / Activities Information Objects & Relations Information Interaction Information Flow Characteristics Information Resources Information Locations Viewpoint = Interaction Perspective End = Information Behaviour 	Solutions of Information Interaction <ul style="list-style-type: none"> Type of Information Exchange Formal / Informal Grouping of Information Objects Grouping of Information Resources Type of Triggers / Events Grouping of Information Types Priority = Dependency of Information Relation = Information Flow End = Information Solutions Sets 	Impact of Change <ul style="list-style-type: none"> Business Case Information Systems Roadmap Security Plan Selection = Set of ICT Supported Objects e.g. Information Roadmap Interface = Type of Information Exchange End = Activities to be supported by ICT
Information – Systems	Systems Goals, Drivers and Concepts <ul style="list-style-type: none"> System Development policy Enterprise Interoperability Policy Business - Technology Enablers Enterprise Responsibility of IS Enterprise Application portfolio Enterprise Guiding Principles End = As-Is / To-Be Information-System landscape 	Extended Enterprise Interoperability <ul style="list-style-type: none"> Enterprise Interoperability Standards Enterprise Interoperability Governance Enterprise Interoperability Quality of Services (e.g. Security) Enterprise Application portfolio Enterprise Collaboration Principles End = To-Be Interoperability Definitions 	Level of Interoperability <ul style="list-style-type: none"> As-Is Information Systems Environment Functional Requirements Non-Functional Requirements Information-Systems Behaviour Abstraction & Precision of Data Quality of Services Characteristics = Time, Availability, Security, Maintainability, etc. Structure = Interfaces 	Type of Interoperability <ul style="list-style-type: none"> Product-Independent Reference Solution (PIRS) IS Functions & behaviour Choice of Middleware Technologies Shared & Pluggable IS Services / Solution sets Interface Definitions & Standards Official & De-facto IS Standards Standards = IS Interoperability Standards End = PIRS 	Solutions for Interoperability <ul style="list-style-type: none"> Product-Specific Reference Solution (PSRS) Map PSRM to Product Solutions and options, etc. Interface Solutions Implementation of Quality of Services Refinement Technical Reference Model Viewpoints = Selection of a Product Solutions Structure = Spectrum of Styles & Solutions sets Quality = Solution Interface Characteristics End = PSRS 	Timeframe of Change <ul style="list-style-type: none"> Business Case Make or Buy Decision Implementation Roadmap Tools for Development / Implementation Governance Plan Security Impact e.g. Design of Application & Components Priority = Dependencies End = Roadmap for realization
Technology - Infrastructure	Technology Goals, Drivers and Concepts <ul style="list-style-type: none"> Locations in which the Business Operates Enterprise Technology Infrastructure policy Enterprise Business - Technology Enablers Enterprise Responsibility of TI Enterprise TI Portfolio Enterprise Guiding Principles End = Map for Enterprise Business Location 	Extended Enterprise Inter-Connection <ul style="list-style-type: none"> Enterprise Inter-Connection Standards Enterprise Inter-Connection Governance Enterprise Inter-Connection Quality of Services (e.g. Security) Enterprise Inter-Connection portfolio Enterprise Inter-Connection Principles End = To-Be Inter-Connection Definitions 	Level of Inter-Connection <ul style="list-style-type: none"> As-Is Enterprise Infrastructure TI Principles Functional Requirements Non-Functional Requirements Quality of Services Characteristics = Time, Availability, Security, Maintainability, etc. Link = Enterprise Business System Connection Node = Enterprise Business System Environm. 	Type of Inter-Connection <ul style="list-style-type: none"> Enterprise Technology Standards Enterprise Infrastructure Profile Enterprise Hardware Systems Profile Enterprise Communication Profile Enterprise Security Profile Enterprise Governance Profile Technical Reference Model & Standards Positioning = Allocation of IT Services - TSM Interaction = Concepts of Service Layering 	Solutions of Inter-Connection <ul style="list-style-type: none"> Technology Overview Solutions & Products for Inter-Connection Formats of Communication Security Integration Refinement Technical Reference Model Node = Hardware + System Software, etc. Connectivity = Middleware / Messaging, etc. End = Structure of Relations, Products + Specifications 	Timeframe of Change <ul style="list-style-type: none"> Business Case Enterprise Transformation Plan Enterprise Priority Setting Enterprise IS Alignment Impact e.g. Blue Print of Technology Implementation Portfolio of Products and Components. Catalogues of used Standards End = Roadmap for Enterprise Implementation

Extended Enterprise Architecture Framework (E2AF)™³

3.1. Separation of Concerns

'Separation of concerns' allow us to deal with conflict of interest between these concerns. We distinguish six main levels of concern within extended enterprise architecture studies often called levels of abstraction:

² The Enterprise Architecture Score Card™ is a trademark of the Institute For Enterprise Architecture Developments.

³ The Extended Enterprise Architecture Framework (E2AF)™ is a trademark of the Institute For Enterprise Architecture Developments.



- **The Contextual level**, describing the extended context of the organization and the scope of the enterprise architecture study. **Why**; Describes the motivations of the enterprise. This reveals the enterprise mission, vision and scope and the business & technology strategy / drivers.
- **The Environmental level**, describing the formal extended business relations and the related information flows. **With Who**; Represents the business & technology relationships within the extended enterprise. The type of collaboration. The design of the extended enterprise organization has to do with the value proposition in the net and the structure of governance within the extended enterprise.
- **The Conceptual level**, addressing the Requirements. **What**; Describes the goals and objectives and the requirements of the enterprise entities involved in each aspect area of the enterprise.
- **The Logical level**, addressing the ideal logical solutions. **How**; Shows the logical solutions within each aspect area.
- **The Physical level**, addressing the physical solution of products & techniques. **With What**; Shows physical solutions in each aspect area, including business & communication changes, supporting software products and tools, hardware & communication products.
- **The Transformational level**, describing the impact for the organization of the proposed solutions. **When**; Represents the transformation roadmap, dependencies within aspect areas, supported by business cases.

3.2. Decomposition of the Enterprise

The 4 rows represent the different aspect areas of the Enterprise:

- **Business or Organization**; starting point and expressing all business elements and structures in scope.
- **Information**; extracted from the business an explicit expression of information needs, flows and relations is necessary to identify the functions that can be automated.
- **Information - Systems**; the automated support of specific functions.
- **Technology - Infrastructure**; the supporting technology environment for the information systems.

All these aspect areas have to be related to each other in such a way that a coherent set of relations can be identified. Integration of these aspect areas is a necessity for an Enterprise Architectural design.

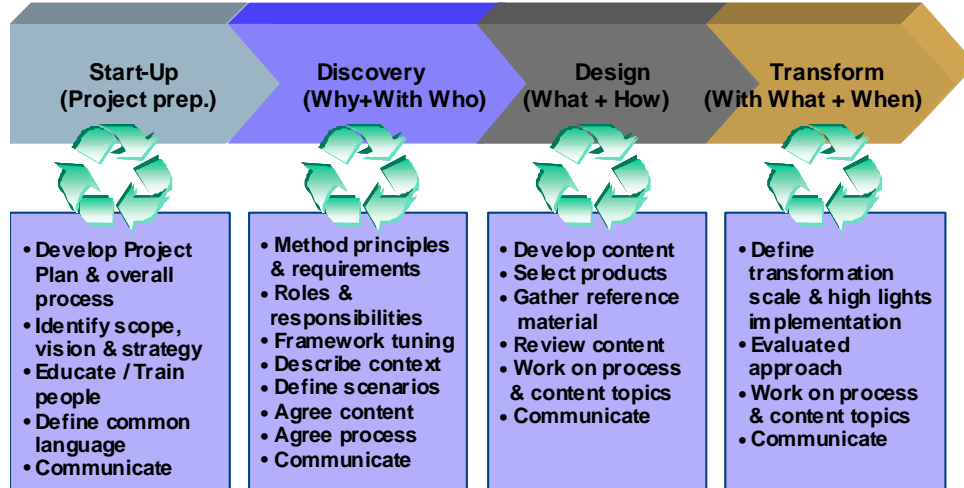
3.3. Enterprise Architectural Viewpoints

Besides the aspect areas of the enterprise architecture, specific views can be created, based on specific viewpoints or themes. Examples of viewpoints are 'Security' and 'Governance'. The impact of viewpoints should be incorporated in the extended enterprise architecture results at all levels.



3.4. Enterprise Architecture Approach

Extracted from the E2A framework an Extended Enterprise Architecture approach can be defined to deal with the goals & objectives of the organization.



An example of such an approach is reflected in the above picture.




4. Enterprise Architecture Score Card Methodology

The Enterprise Architecture Score Card is using a methodology related to the earlier mentioned enterprise architecture aspect areas and abstraction levels by the fact that during an enterprise architecture process all these elements have to be addressed and described depending on the goals & objectives.

Based on these elements a methodology is developed to get insight and overview of the status of the addressed topics related to the quality of the enterprise architecture in scope.

Based on questionnaires per aspect area and abstraction level and over aspect areas, facts can be established to check the quality of the enterprise architecture efforts.



Institute For Enterprise Architecture Developments		Enterprise Architecture Score Card™				© Copyrights, 2001 - 2004, IFEAD					
		Clear = Well defined and documented Partially Clear = partially addressed and documented Unclear = NOT identified or addressed, NOT defined or NOT documented									
Status definition: Clear = 2 Partially Clear = 1 Unclear = 0		Status definition: Clear = 2 Partially Clear = 1 Unclear = 0		Status definition: Clear = 2 Partially Clear = 1 Unclear = 0		Status definition: Clear = 2 Partially Clear = 1 Unclear = 0		Level of Alignment / Integration Factor 0-2; 0=Insufficient 1=Average 2=Full		Total Status 2 Total Status 1 Total Status 0	
ASC		Business	Information	Information Systems	Technology Infrastructure						
Questions to the enterprise architecture result											
1	Are the Mission, Vision, Goals & Objectives of the enterprise architecture?	2	2	1	0	2	2	1	1		
2	Is the Scope of the enterprise architecture program?	2	2	2	2	2	4	0	0		
3	Is the Form & Function Level of deliverables?	2	2	2	2	1	4	0	0		
4	Is the Business & IT Strategy?	1	1	0	0	1	0	2	0		
6	Are the Guiding Principles & Drivers?	0	0	0	0	0	0	0	4		
7	Are the Key Performance Indicators?	1	1	1	1	1	0	4	0		
8	Are the Critical Success Factors?	2	2	1	1	1	2	2	0		
9	Are the Critical Stakeholders?	1	1	1	1	0	0	4	0		
Sub-Score Contextual Level		11	11	8	7						
10	Are the Collaborative Parties involved?	2	1	1	2	2	2	2	0		
11	Are the Contractual Agreements?	2	0	0	1	1	1	1	2		
12	Are the Interoperability Standards?	0	1	2	2	1	2	1	1		
13	Are the related Law & Regulations?	1	1	0	0	0	0	2	2		
14	Is the Ownership of Information?	1	1	0	2	1	1	2	1		
Sub-Score Environmental Level		6	4	3	7						
11	Are the Functional Requirements?	1	1	2	2	1	2	1	0		
12	Are the Non-Functional Requirements?	1	1	0	1	0	0	2	0		
	Are the Concepts in use?	2	1	1	2	1	2	2	0		
13	Are the Security Requirements?	0	0	1	0	0	0	1	0		
14	Are the Governance Requirements?	1	1	1	1	1	0	4	0		
Sub-Score Conceptual Level		5	4	5	6						
15	Are the deliverables at logical level?	1	2	1	2	1	2	2	0		
16	Are the critical logical design decisions?	1	1	2	2	0	2	2	0		
17	Are the critical logical design decisions traceable?	0	0	1	1	1	0	2	2		
18	Are the Logical Description Methods & Techniques?	2	1	1	0	1	1	2	0		
19	Is at logical level the use of Modelling Tools?	1	1	1	0	1	0	3	1		
20	Are the Logical Standards?	1	0	1	2	1	1	2	1		
Sub-Score Logical Level		6	5	7	7						
21	Are the deliverables at physical level?	1	1	2	2	1	2	2	0		
22	Are the critical physical design decisions?	1	2	2	2	1	3	1	0		
23	Are the critical physical design decisions traceable?	1	2	2	2	0	3	1	0		
24	Are the Physical Description Methods & Techniques?	2	1	1	0	1	1	2	1		
25	Is at physical level the use of Modelling Tools?	0	1	1	0	1	0	2	2		
26	Are the Physical Standards?	1	0	1	2	1	1	2	1		
Sub-Score Physical Level		6	7	9	8						
27	Critical Design Decisions	0	0	1	1	0	0	2	0		
28	Is the Organizational Impact?	1	1	2	2	1	2	1	0		
29	Are the Costs Consequences?	0	0	0	0	2	0	0	4		
30	Is the Security Impact?	0	0	0	0	1	0	0	4		
31	Is the Governance Impact?	0	0	1	1	1	0	2	2		
Sub-Score Transformational Level		1	1	4	4						
Total-Score All Level		35	32	36	39						



5. Explanation of the used criteria & terminology

Using the Enterprise Architecture Score Card as a measurement instrument to check the quality of the EA efforts, can be done by answering the questions based on the assessed status with the goals and objectives of the enterprise architecture program in mind.

Every Question has to be assessed for the **Business, Information, Information-Systems** and **Technology Infrastructure** areas. A special item is focusing at the level of **Alignment / Integration** between these areas or *How Holistic* was the approach and *How Holistic* was this documented?

For each of these areas the result of each question can be assessed from 3 different situations.

Status 0 = Unknown and not documented (**red**);

Status 1 = Partly known and partly documented (**yellow**);

Status 2 = Fully known and well documented (**green**).

Besides these 3 values, the level of alignment / integrated for each question is assessed.

So the answer of each question encompasses the elements of **knowledge** and **documentation**.

Having the knowledge, but this knowledge is not documented, means maintenance cannot be done and the knowledge is not transferable to other people.

5.1. Calculation

Sub-totals and totals reflect the valuation for the quality of the assessed enterprise architecture results as well for the addressed completeness of the enterprise architecture process phases.

A more in-depth insight en overview of the quality of the enterprise architecture effort can be derived, based on this approach and steering can be done in areas with to less quality.

Questions with status 1 must be examined more in depth, to get more information about the availability, dependency, quality and level of documentation. Important is to get the **rationales of decisions** made during the enterprise architecture process.



5.2. Maintainability

Besides the assessment of the quality, **maintainability** is even so a very important issue to address during the assessment process.

Are the enterprise architecture results in such a way documented that in a later stage other enterprise architects can easily understand and maintain that enterprise architecture? The topic of maintainability has to be explicitly addressed in the overall review report.

Enterprise Architecture Modeling & Documentation Tools can be very helpful in maintaining Enterprise Architectures.

Best practices within organizations will constantly update and refine this methodology. So if you have any experience with reviewing enterprise architecture projects and results, please share your experiences so that we can refine the Enterprise Architecture Score Card.

5.3. Project set up

Experiences within organizations show that enterprise architecture projects that will be reviewed, are better planned, better managed and better documented. So let your enterprise architecture team know up front that their processes and results will be reviewed. That will directly influence the overall quality of the enterprise architecture program.

Extended Enterprise Architecture Maturity Model (E2AMM) SM = Service Mark of IFEAD

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