Banking Industry
Architecture Network
&
The Open Group

Integrating the TOGAF® Standard with the BIAN Service Landscape

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Organization

Authors		
Role	Name	Company
Author	Paul Bonnie	ING
Author	Thomas Obitz	KPMG LLP (UK)
Author	Konrad Danzebrink	BIAN
Author		

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TOGAF 9.1		www.opengroup.org/togaf
BIAN Service Landscape 2.0		http://bian.org/servicelandscape-2-0/
BIAN Metamodel 2.0		http://bian.org/wp-content/uploads/2013/02/Supplements_BIAN_Service_Landscape_20.zip

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2.0	15 October 2013	Paul Bonnie, Thomas Obitz Updated and made consistent with BIAN Service Landscape 2.0
2.1	06.11.2017	Changed Business Capability to Business Capacity

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Table of Contents

Management Summary

Since the first release of this paper in 2011, it has become clear that states (as represented by regulators) have fundamentally re-shaped the market place for financial institutions. As banks switch back into growth mode, they realize that they need to re-allocate resources to thrive in the new environment.

New and changing business models and strategies trigger major initiatives at operational and IT level. Organizations require an approach to plan these initiatives as integrated transformations across the organization. They want to ensure they are delivering the right capabilities, and they want to ensure they are delivering these initiatives reliably at adequate cost. As a result, Enterprise Architecture has become an approach which is highly in demand.

The role of Enterprise Architecture is further emphasized by regulations recognizing its benefit in terms of transparency. As an example, a recent publication of the Bank for International Settlement[1] urges banks to strengthen their IT and data architecture considerably to provide top management and regulators with a consistent group-wide view of risk exposure. A similar call was made by the Commission on the Structure of Dutch Banks as the Commission has sought to explore the benefits of an Enterprise Architecture in ensuring the stability of the Dutch banking sector[2].

This White Paper aims at supporting Enterprise Architects within the banking industry, reaping the synergies of two complementary industry frameworks:

- TOGAF, an Open Group Standard, is a proven Enterprise Architecture methodology and framework used by leading global organizations to improve business efficiency.
- BIAN, the Banking Industry Architecture Network, delivers an overall framework and set of IT Service definitions and BIAN Business Scenarios specific to the banking industry, aimed at improving systems interoperability.

There are clear synergies in using BIAN in combination with TOGAF. When applying TOGAF in a banking environment, the BIAN content contributes to accelerated delivery through its banking industry-specific architecture content. On the other hand, TOGAF facilitates architecture development work by providing a structured approach and a complete structure of relevant artifacts. Hence, TOGAF adds value to the BIAN deliverables especially for the project approach and capability to perform.

In the White Paper, the concepts and core elements of both frameworks are described in order to reach a common understanding.

With respect to the TOGAF Enterprise Continuum, the BIAN content is positioned as an industry-specific architecture within the Architecture Continuum, addressing banking application-to-application integration issues.

With respect to the TOGAF Content Metamodel, the main BIAN content (Business Objects, the BIAN Service Landscape and the BIAN Business Scenarios) is positioned in the Information System Architecture.

In the heart of the White Paper, both TOGAF and BIAN are mapped to each other. The leverage of the BIAN deliverables in the context of the TOGAF Architecture Development Method (ADM) is further elaborated. For each step in an architecture development process, the integration of BIAN deliverables is described.

In applying both BIAN and TOGAF in an integrated way, Enterprise Architects are able to speed up their work and improve quality and consistency of the architecture products they deliver.

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[1] Principles for effective risk data aggregation and risk reporting, BIS 2013, http://www.bis.org/publ/bcbs239.htm

[2] TOWARDS A SERVICEABLE AND STABLE BANKING SYSTEM, http://www.rijksoverheid.nl/onderwerpen/hervorming-financieel-stelsel/documenten-en-publicaties/kamerstukken/2013/06/28/rapport-naar-een-dienstbaar-en-stabiel-bankwezen.html

1 Introduction

1.1 Re-Architecting the Banking Industry

Since the first release of this paper in 2011, it has become clear that states (as represented by regulators) have fundamentally re-shaped the market place for financial institutions. Banks realize they need to re-allocate resources to thrive in the new environment.

Industry maturity is another essential driver of banking transformation. Significant parts of both the services and the product portfolio are getting commoditized, resulting in margin pressures, but also forcing to reap cost-saving opportunities. Changing customer behavior and non-traditional providers of banking services have a deep impact, particularly in the retail banking industry. Emerging economies offer opportunities for growth. Banks have to manage risks carefully, and report transparently and consistently on their activities.Banks react by rationalizing their product and services portfolios. Automation reduces the cost of manual labor. Organizations distribute processes around the globe, or outsource them. White-labeled products can be sold in the supermarket. Social networks offer new opportunities to engage an empowered consumer.

These developments result in increasing tension between the needs of financial institutions and the capabilities of their IT landscapes. Bespoke systems hardwire the operating model of the past. Monolithic platforms make it difficult to facilitate carving out organizational units and processes. Core systems with limited flexibility have been patched up by layers of supporting systems. Functionality is duplicated by business silos and channel stovepipes, duplicating maintenance effort and hampering information consistency.

Remediation requires transformational change – which promises huge dividends. A recent study[3] suggests that banks replacing their core banking systems experience an acceleration of their pre-tax profit growth rate by 30%. However, the transformation is challenging and needs careful planning. Given the close inter-dependency of operations and IT in financial institutions, an integrated approach to change is required.

Enterprise Architecture is crucial to enabling such initiatives. Today, there is an overwhelming interest in this technique and virtually every large corporation (and bank) has an Enterprise Architecture team.

1.2 TOGAF and BIAN Initiatives

Two initiatives in the field of Enterprise Architecture have gained significant interest in the financial industry – TOGAF and BIAN:

- TOGAF, an Open Group Standard, is a proven Enterprise Architecture methodology and framework used by leading global organizations to improve business efficiency. It is a prominent and reliable Enterprise Architecture standard, ensuring consistent application of standards, methods, and communication among Enterprise Architecture professionals.
- BIAN, the Banking Industry Architecture Network, also gains significant traction in the banking industry. Its success mirrors the increasing importance of standard software in a maturing industry. The BIAN Service Landscape is a blueprint for the logical components of a bank's IT environment. Leveraging this blueprint and the Service Domain Specifications can significantly accelerate architecture initiatives – be it in the planning of change initiatives, in the procurement of components, or the benchmarking of an existing landscape against best practices.

1.3 White Paper Objectives

Both TOGAF and BIAN are not only powerful, but also exhaustive in their domains. This White Paper brings these two frameworks together and shows banking industry architects the opportunity they have to reap the synergies of both frameworks and accelerate their work.

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[3] Marcus Heidmann: Overhauling Bank's IT Systems, McKinsey Quarterly, March 2011: www.mckinseyquarterly.com/Overhauling_banks_IT_systems_2554.

1.4 White Paper Structure

This White Paper is organized into the following sections:

- Section 2 analyzes the current situation in the banking industry and its IT environment.
- Chapter 3 describes the specifics of Enterprise Architecture in the banking industry.
- Chapter 4 provides an introduction to BIAN and Chapter 5 provides an introduction to TOGAF. Readers familiar with either framework may skip the respective material.
- Chapter 6 is the heart of this White Paper; it maps both BIAN and TOGAF to each other, explains how to leverage the BIAN deliverables in the context of the TOGAF Architecture Development Method (ADM), how BIAN integrates with the TOGAF Content Framework, and how BIAN helps to build an architecture capability.
- Chapter 7 describes other frameworks, which an Enterprise Architect in a bank might find useful.
- Chapter 8 is the glossary, explaining the most important terminology used in this White Paper.
- Chapter 9 details the most important elements of the BIAN Metamodel.

1.5 Future Evolution of this White Paper

This version of the White Paper is based on version 2.0 of the BIAN Services Landscape and Business Scenarios and on TOGAF version 9.1 of The Open Group. The authors endeavor to continue updating and enhancing the document as appropriate. Enhancements might be appropriate with the evolution to future versions of the BIAN Service Landscape or the TOGAF framework.

The authors hope that their effort will help you – the reader – to succeed in today's complex banking industry environment.

2 Drivers in the Banking Industry

2.1 External Business, Market and Regulatory Drivers

In 2013, the banking industry prepares for getting back into growth mode – in a fundamentally changed market. These changes have been driven by internal and external change drivers in the market-place, by changing customer behavior, and by a radically different regulatory environment. Although some of these changes were prompted by the global financial crisis, most of them have been ongoing for several years.

During the recent crisis, a significant part of the banking sector has come to face not only a severe shortage of liquidity, but even of capital. They became dependent on government bailout for sheer survival; significant funding had to be injected by the public sector. As a result, capital and liquidity rules have been tightened significantly. Regulatory regimes and accounting standards (such as Basel III, Dodd-Frank, EMIR, MiFID II, FATCA and IFRS) will continue to change the environment in which banks are operating. Striving for compliance is not sufficient. Financial institutions need to reinvent themselves to be successful in this market. They need to find new business models and strengthen their capital base. Their appetite and ability to take risk has lowered considerably. Limits on leverage ratios and higher requirements of regulatory capital constrain their ability to take up new business.

Allegations of product mis-selling (such as swaps to small and medium enterprises in the UK and The Netherlands) do suggest that in the past, product sales were not always in line with customer needs. Customer loyalty decreased, and regulators started targeting conduct risk. More and more banking services and products – and most of the retail products, like payments, savings, and loans – have become increasingly commoditized.

Finally, new players (like Google, PayPal, Zopa, etc.) have entered the financial market, claiming a (niche) part of the market without the burden of a legacy full-service product offering.

2.2 Responses of Banks

In this new market, players have to find new profitable areas of business and at the same time to control costs tightly. In a quest for cost reduction and operational excellence, internal processes are streamlined and optimized by techniques such as Lean and Six Sigma. Activities are automated and manual interventions are minimized. Straight Through Processing (STP) increases throughput and reduces errors. Product factories replace the traditional branch back-office, processes are distributed across multiple operational centers around the globe. As a result, volumes can be scaled at sub-linear cost.

Product portfolios are harmonized and optimized. This typically results not only in fewer and simpler products and services, but also in a modular product design. White-labeling allows institutions to procure parts of their product portfolio without managing additional processing complexity and it enables them to widen the market reach for their own products, even using non-traditional channels like supermarkets and online merchants.

Other ways of expanding the market of an organization are by improving access to its service offerings across multiple channels. Banks are adopting a flexible and more personalized “on-demand” approach, with products available anywhere (via the “channel of choice”) and anytime at the lowest cost. Today, customers expect their bank to support new online real-time channels through mobile devices, integrated and consistent with the traditional branch and call-center channels.

Banks need to understand the risks they are exposed to at a group level. Siloed IT landscapes and gaps in data architecture as well as data quality make it impossible for most to achieve this visibility. This has attracted regulatory attention[4].

[4] Principles for effective risk data aggregation and risk reporting, BIS 2013, http://www.bis.org/publ/bcbs239.htm

2.3 Impact on the IT Landscape of Banks

Almost all assets managed by a financial institution are completely virtualized – represented as booking entries or, more generally, as information. Hence, information processing and its enabling technology are of tremendous relevance to the banking industry. Its IT spend in 2011 is estimated to reach 8.7% of revenues – almost three times the cross-industry average.[5]

Today, banks are running an IT platform of enormous complexity. This impacts their ability to react quickly to a changing market, affecting their cost/income ratio, and driving the risk associated with any further change.

Most banks have a long history in IT. Many core systems were developed in-house several decades ago; in particular, the current account and lending platforms of commercial and retail banks often were developed in the 1960s and 1970s. Over the years, functionality for new products was added; the migration from the batch to a near-time processing paradigm required deep re-engineering. Support for new channels was added around the core platforms; so were systems for risk management, compliance, security, and regulatory reporting. Mergers and acquisitions, as well as insourcing and outsourcing added further complexity to the IT landscape. The need for integration resulted in a hairball of system dependencies, making change tedious at best.

While banks have proven to be very successful in standardizing external communication, internal integration often has been achieved in a proprietary way. Many firms have implemented a common integration platform – using EAI (Enterprise Application Integration) or ESB (Enterprise Service Bus) approaches – but use proprietary data formats with it. These proprietary data formats create maintenance challenges and vendor dependencies as organizations attempt to move to off-the-shelf solutions. This ends in situations which require complex mappings, which keep integration cost high on an ongoing basis. The outcome is that still over 70% of the decreasing IT-budgets are spent on 'Running the Business' ('Keeping the lights on') whilst it should be on 'Changing the Business'[6].

As landscapes were built over decades, the development of IT during this time-span has manifested itself in a technology stack which grew in a way not dissimilar to sediment depositions. Hardware platforms, programming languages, transaction monitors, databases, application servers, standard software platforms, and integration technologies of about 50 years have manifested themselves, forcing banks to keep a skill set of enormous diversity and raising concerns about operational risk related to technical obsolescence.

2.4 Implied Change in IT

As a consequence of the above, many banks find that their IT landscape is complex, inflexible, and silo-based, impacting their ability to thrive in a dynamic and competitive marketplace:

- To achieve oversight of risks, banks need to perform major improvements to their data and system architecture. They need to establish consolidated master sources of shared reference data, and they need to break down the system silos.
- Running IT is becoming more costly – the Total Cost of Ownership (TCO) is perceived to be very high. "Keeping the lights on" requires an increasing part of decreasing IT budgets. Funding for new initiatives, becomes challenging, impacting competitiveness. Key resources are locked up in maintenance activities.
- Due to the complexity of the IT landscape, the time-to-market for introducing new or amending existing products and services is too long; often, the cost of change is too high to achieve a positive business case of initiatives.
- Integrating new products in the current IT landscape is not without risk and may add further complexity.

All this puts significant pressure on the IT function. Numerous measures are taken to mitigate the pain. IT rationalization, active life-cycle management, the adoption of market and industry standards, the utilization of

[5] 2011 Information Week 500 Survey: http://analytics.informationweek.com/abstract/186/8354/InformationWeek+500/2011-informationweek-500-report-and-issue.html.

[6] Deutsche Bank Research Study (2012): IT in Banks, What does it cost?

Service Oriented Architecture (SOA), and the selection and implementation of readily available software packages and solutions are just a few to mention.

In this context, more and more institutions are approaching the replacement of custom-built core platforms. In the past, banks have been hesitant changing them. Despite the perceived risk, the rewards are high: A study[7] suggests that banks replacing their core banking systems experience an acceleration of their pre-tax profit growth rate by 30%. In many cases, however, changes are perceived as IT-driven. A lack of traceability against the overall objectives of the organization results in limited support and commitment of IT changes by other non-IT business functions. A holistic approach to transformation is required.

[7] Marcus Heidmann: Overhauling Bank's IT Systems, McKinsey Quarterly, March 2011: www.mckinseyquarterly.com/Overhauling_banks_IT_systems_2554.

3 Enterprise Architecture

In this situation of urgently required transformational change in the banking industry, Enterprise Architecture becomes a central tool for enabling the transformation process of both IT and the overall business.

3.1 Development of Enterprise Architecture Discipline

Today, many organizations find that architectural approaches are applicable not only to the transformation of IT. As parts of processes are sourced externally and distributed across organizations, and as parts of the value chains are delegated to partners, architecture becomes an indispensable planning tool.

As discussed before, banks are amidst transformational change in the market-place, in their way of doing business, and in their IT landscapes. Given the close inter-dependency of people, processes, and supporting technology, most banks are well aware of the need to manage their architecture in a coherent way, in alignment with their strategy. Enterprise Architecture is a tool for achieving this objective.

Many financial institutions have set up Enterprise Architecture functions early, and they have evolved into a crucial tool for driving projects in alignment of business and IT. They are also in the process of manifesting the close linkage of business processes and their supporting IT assets in the organizational set-up.

Hence, Enterprise Architecture in the banking industry appears to be in a strong position.It appears to be well-positioned to influence the organization for converging to a consistent and strategy-aligned Target Architecture. However, there are also some challenges specific to this industry.

3.2 Challenges for Enterprise Architects in a Banking Environment

Enterprise Architects in the banking industry – like in any other industry – face a number of challenges.

In most institutions, there is no overall (documented) description of business processes and their supporting IT assets, indicating a potential gap in the Business/IT-alignment. In general, banks have not documented their overall Business Architecture, with some parts of the landscape missing or under-developed. Consequently, many banks do not have a full and complete insight into their services, demonstrated by a complete, up-to-date, and widely known service catalog. All of this is reflected in a fragmented IT landscape.

The influence of Enterprise Architecture in decision-making both on a strategic level and in actual projects is questionable at times. This is not specific to the banking industry as such; in general the governance of Enterprise Architecture is a challenge. Enterprise Architects sometimes have insufficient authority and mandate of the organization to actually enforce ‘compliance’ with the architecture. Sometimes architects are insufficiently capable to explain (the importance of) Enterprise Architecture.

On the other hand, vendors are sometimes unable or unwilling to meet the requirements of the Enterprise Architecture, because of cost reasons. Until recently, there even were no industry standards that suppliers or banks should adhere to. In the past, every bank invented its ‘own wheel’, assuming that banking processes differ greatly. In reality, of course, this is not the case. However, this has led to costly (IT) programs, which has caused senior banking management to distrust or at the very least be nervous over Enterprise Architecture and IT.

These challenges created the awareness that there is a need for standards in the field of Enterprise Architecture for banks. Both TOGAF and BIAN have a positive impact on these challenges. In terms of architectural work, TOGAF establishes a shared approach and vocabulary. The definition of the architecture capability in TOGAF helps to identify processes relevant for setting up appropriate architecture governance. The BIAN deliverables can serve as a reference to benchmark architectural documentation, for identifying gaps and for structuring the response to business events.

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4 BIAN – A Business Service Model for the Banking Industry

4.1 BIAN Vision and Strategy

As mentioned in the previous chapters, significant transformative forces have influenced the banking industry over the years. Significant renewal of existing platforms is required, and standard software will play a significant role in this process. The service-oriented paradigm is an approach for orchestrating business capabilities based on interoperable components throughout the organization. A business capability typically defines what a business's purpose is (goals and objectives), its core competencies, and is therefore directly bound to business objectives and strategy. However, to plan this transformation, to ensure interoperability, and to contain integration cost, a common semantic framework is highly advantageous. BIAN aims to address this need.

The Banking Industry Architecture Network (BIAN), founded in 2008, is a global not-for-profit association of banks, service providers, and software vendors in the banking industry. BIAN is an open and independent community in which the members freely exchange banking IT requirements concerning Service Oriented Architecture (SOA). BIAN is formed with the intention of establishing banking industry standards to improve information systems interoperability. BIAN's focus is on defining standard service operations typically found within an organization described as Application-to-Application (A2A).

BIAN's vision of an industry-wide consensus regarding SOA for banking systems is closely aligned to the business objectives of agility and reduced (integration) cost. This vision is based on the concept of achieving the flexibility required by implementing:

- Standards-based semantic interoperability of in-house built and commercially productized banking IT services.
- Banking IT (SOA) services which are independent of the technology platform.

BIAN has the strategy to bring banks, service providers, and software vendors together in a community to achieve synergies. This synergy is achieved by:

- Collaborating on a consensus understanding of the requirements for "banking enterprise IT services" within an SOA framework.
- Formally describing the services required to orchestrate a banking IT landscape.
- Close alignment with other standardization bodies like OMG, ISO, and IFX to prevent 'development of similar wheels'.
- Encouraging the adoption of existing or new industry semantic standards, including descriptions of service boundaries and responsibilities, service operations, and the messages that serve as input and output to the service operations.

More information on this can be found on the BIAN website: www.BIAN.org.

4.2 BIAN Deliverables

BIAN's standards are captured within the context of what is collectively referred to as the BIAN SOA Design Framework. The Design Framework is made up of the following key components, which are further described in the following chapters:

- BIAN Metamodel: the definitions of the concepts used to define the BIAN deliverables.
- BIAN Service Landscape: a structured reference framework containing all identified elemental business capabilities.
- BIAN Service Domain Specifications: the elemental business capabilities. Their specifications outline their internal functions and the service operations that they offer and consume in operation.
- BIAN Business Scenarios: present archetypical examples of BIAN Service Domains collaborating with one another through service operations in the execution of a business event.

4.3 BIAN Metamodel

The BIAN Metamodel (currently version 2.0) is a detailed and comprehensive (UML) model that defines all the BIAN design structures. The BIAN Metamodel is ISO 20022 compliant, being an extension of the Metamodel defined by the ISO 20022 financial industry standard.

In the following paragraphs, the most relevant views of the BIAN Metamodel are briefly described. A detailed explanation is provided in the appendix (see Chapter 9).

4.3.1 Metamodel Viewpoint: The BIAN Service Landscape

The key constituents of the BIAN Service Landscape are:

- The Business Area, is the highest-level classification. A Business Area groups together a broad set of business capabilities. For the BIAN Service Landscape they are defined to be aspects of business activity that have similar supporting application and information specific needs. (e.g., “Operations & Execution”, “Reference Data”, “Sales & Service”).
- The Business Domain is the next level, defining a coherent collection of capabilities within the broader Business Area. In the BIAN Service Landscape the Business Domains are associated with skills and knowledge recognizable in the banking business. (e.g., “Payments” as a Business Domain within the Business Area “Operations & Execution”).
- The BIAN Service Domain is the finest level of partitioning, each defining unique and discrete business capabilities. The BIAN Service Domains are the ‘elemental building blocks’ of a service landscape (e.g., “Payments Execution” is a BIAN Service Domain within the “Payments” Business Domain). A BIAN Service Domain owns a specific business object, its focus object (see below).
- The Service Group is a set of Service Operations, and is owned by a BIAN Service Domain. In essence, it is an interface to the BIAN Service Domain that is defined in terms of business semantics rather than in technical IT terms. (e.g., “manage payment order”).
- The Service Operation represents a service defined at the level of business semantics, specifying the access to one or more capabilities of a BIAN Service Domain (e.g., “execute payment order” or “update payment order’” are Service Operations of the Service Group “manage payment order”).

4.3.2 Metamodel Viewpoint: Business Objects

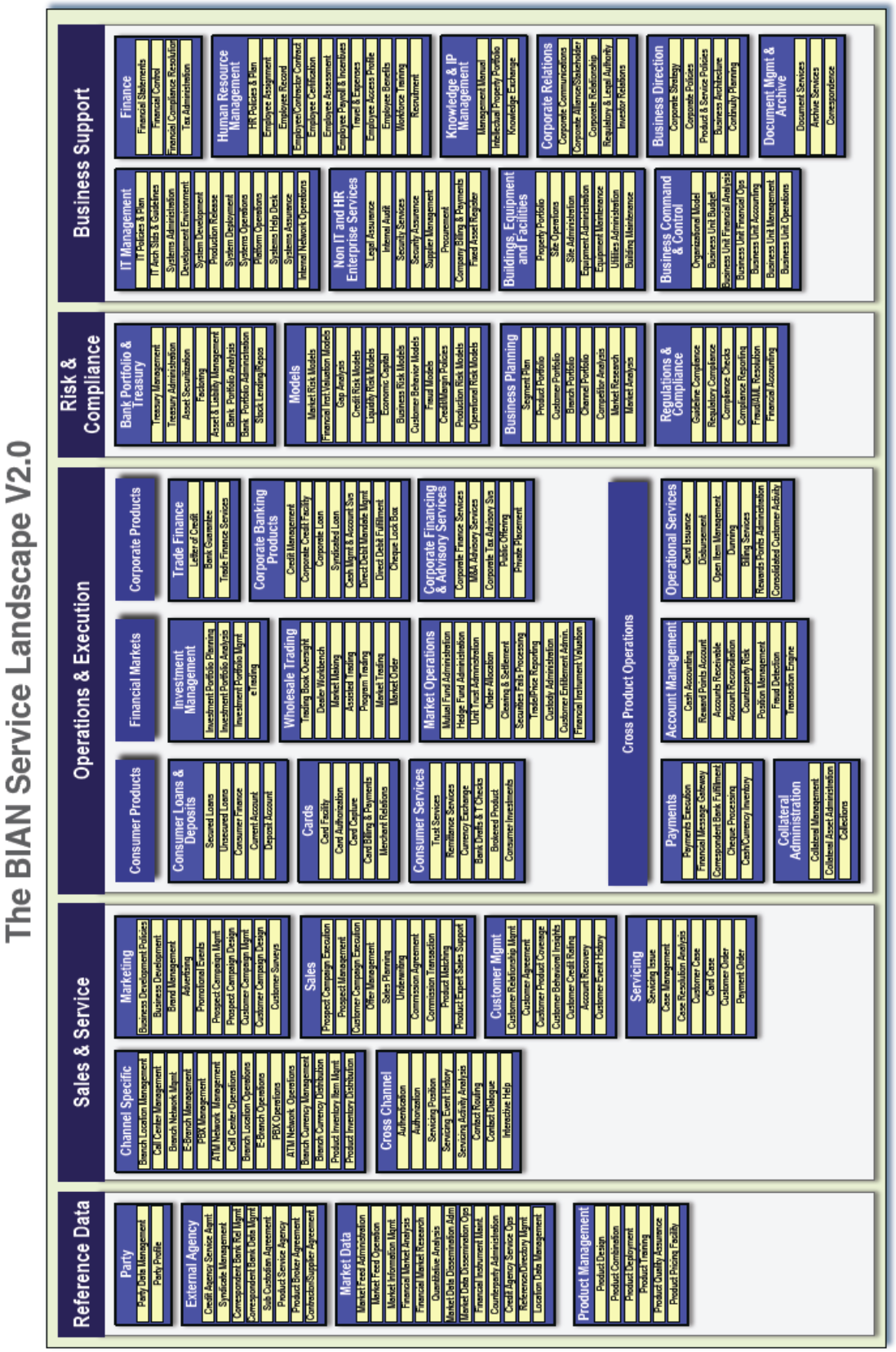
A Business Object is an individually distinguishable element characterized by the fact that it has a well-defined identity, structure and behavior. The Business Object in BIAN is a specialization of ISO20022 Business Component. Business Objects are fundamental to the definition of BIAN Service Domains, as each BIAN Service Domain has exactly one Focus Object, and possibly multiple other objects that the BIAN Service Domain references.

4.3.3 Metamodel Viewpoint: Message

Messages play a fundamental role in the definition of Service Operations, as a Service Operation may have an input message, may have an output message, and must have a fault message.

4.4 BIAN Service Landscape

The BIAN Service Landscape (see the next page) is a reference framework that contains all identified BIAN Service Domains. Its purpose is to provide a mechanism for quickly identifying and selecting BIAN Service Domains. The landscape uses a hierarchical decomposition of general banking industry capabilities at three levels (Business Area, Business Domain and Service Domain).


The BIAN Service Landscape V2.0
Reference Data
Party
Party Data Management
Party Profile
External Agency
Credit Agency Service Agmt
Syndicate Management
Correspondent Bank Rel Mgmt
Correspondent Bank Data Mgmt
Sub Custodian Agreement
Product Broker Agreement
Contractor/Supplier Agreement
Market Data
Market Feed Administration
Market Feed Operation
Market Information Mgmt
Financial Market Analysis
Financial Market Research
Quantitative Analysis
Market Data Dissemination Adm
Market Data Dissemination Ops
Financial Instrument Mgmt
Counterparty Administration
Credit Agency Service Ops
Reference/Directory Mgmt
Location Data Management
Product Management
Product Design
Product Combination
Product Deployment
Product Training
Product Quality Assurance
Product Pricing Facility
Sales & Service
Channel Specific
Branch Location Management
Call Center Management
Branch Network Mgmt
E-Branch Management
PBX Management
ATM Network Management
Call Center Operations
Branch Location Operations
E-Branch Operations
PBX Operations
ATM Network Operations
Branch Currency Management
Branch Currency Distribution
Product Inventory Mgmt
Product Inventory Distribution
Cross Channel
Authentication
Authorization
Servicing Position
Servicing Event History
Servicing Activity Analysis
Contact Routing
Contact Dialogue
Interactive Help
Marketing
Business Development Policies
Business Development
Brand Management
Advertising
Promotional Events
Prospect Campaign Mgmt
Prospect Campaign Design
Customer Campaign Mgmt
Customer Campaign Design
Customer Surveys
Sales
Prospect Campaign Execution
Prospect Management
Customer Campaign Execution
Offer Management
Sales Planning
Underwriting
Commission Agreement
Commission Transaction
Product Matching
Product Expert Sales Support
Customer Mgmt
Customer Relationship Mgmt
Customer Agreement
Customer Product Coverage
Customer Behavioral Insights
Customer Credit Rating
Account Recovery
Customer Event History
Servicing
Servicing Issue
Case Management
Case Resolution Analysis
Customer Case
Card Case
Customer Order
Payment Order
Operations & Execution
Consumer Products
Consumer Loans & Deposits
Secured Loans
Unsecured Loans
Consumer Finance
Current Account
Deposit Account
Cards
Card Facility
Card Authorization
Card Capture
Card Billing & Payments
Merchant Relations
Consumer Services
Trust Services
Remittance Services
Currency Exchange
Bank Drafts & T/Checks
Brokered Product
Consumer Investments
Financial Markets
Investment Management
Investment Portfolio Planning
Investment Portfolio Analysis
Investment Portfolio Mgmt
eTrading
Wholesale Trading
Trading Book Oversight
Dealer Workbench
Market Making
Assisted Trading
Program Trading
Market Trading
Market Order
Market Operations
Mutual Fund Administration
Hedge Fund Administration
Unit Trust Administration
Order Allocation
Clearing & Settlement
Securities Fails Processing
Trade/Price Reporting
Custody Administration
Customer Entitlement Admin.
Financial Instrument Valuation
Corporate Products
Trade Finance
Letter of Credit
Bank Guarantee
Trade Finance Services
Corporate Banking Products
Credit Management
Corporate Credit Facility
Corporate Loan
Syndicated Loan
Cash Mgmt & Account Svs
Direct Debit Mandate Mgmt
Direct Debit Fulfilment
Cheque Lock Box
Corporate Financing & Advisory Services
Corporate Finance Services
M&A Advisory Services
Corporate Tax Advisory Svs
Public Offering
Private Placement
Cross Product Operations
Payments
Payments Execution
Financial Message Gateway
Correspondent Bank Fulfilment
Cheque Processing
Cash/Currency Inventory
Collateral Administration
Collateral Management
Collateral Asset Administration
Collections
Account Management
Cash Accounting
Reward Points Account
Accounts Receivable
Account Reconciliation
Counterparty Risk
Position Management
Fraud Detection
Transaction Engine
Operational Services
Card Issuance
Disbursement
Open Item Management
Dunning
Billing Services
Rewards Points Administration
Consolidated Customer Activity
Risk & Compliance
Bank Portfolio & Treasury
Treasury Management
Treasury Administration
Asset Securitization
Factoring
Asset & Liability Management
Bank Portfolio Analysis
Bank Portfolio Administration
Stock Lending/Repos
Models
Market Risk Models
Financial Inst Valuation Models
Gap Analysis
Credit Risk Models
Liquidity Risk Models
Economic Capital
Business Risk Models
Customer Behavior Models
Fraud Models
Credit/Margin Policies
Production Risk Models
Operational Risk Models
Business Planning
Segment Plan
Product Portfolio
Customer Portfolio
Branch Portfolio
Channel Portfolio
Competitor Analysis
Market Research
Market Analysis
Regulations & Compliance
Guideline Compliance
Regulatory Compliance
Compliance Checks
Compliance Reporting
Fraud/AML Resolution
Financial Accounting
Business Support
IT Management
IT Policies & Plan
IT Arch Stds & Guidelines
Systems Administration
Development Environment
System Development
Production Release
System Deployment
Systems Operations
Platform Operations
Systems Help Desk
Systems Assurance
Internal Network Operations
Non IT and HR Enterprise Services
Legal Assurance
Internal Audit
Security Services
Security Assurance
Supplier Management
Procurement
Company Billing & Payments
Fixed Asset Register
Buildings, Equipment and Facilities
Property Portfolio
Site Operations
Site Administration
Equipment Administration
Equipment Maintenance
Utilities Administration
Building Maintenance
Business Command & Control
Organizational Model
Business Unit Budget
Business Unit Financial Analysis
Business Unit Financial Ops
Business Unit Accounting
Business Unit Management
Business Unit Operations
Finance
Financial Statements
Financial Control
Financial Compliance Resolution
Tax Administration
Human Resource Management
HR Policies & Plan
Employee Assignment
Employee Record
Employee/Contractor Contract
Employee Certification
Employee Assessment
Employee Payroll & Incentives
Travel & Expenses
Employee Access Profile
Employee Benefits
Workforce Training
Recruitment
Knowledge & IP Management
Management Manual
Intellectual Property Portfolio
Knowledge Exchange
Corporate Relations
Corporate Strategy
Corporate Communications
Corporate Alliance/Stakeholder
Corporate Relationship
Regulatory & Legal Authority
Investor Relations
Business Direction
Corporate Strategy
Corporate Policies
Product & Service Policies
Business Architecture
Continuity Planning
Document Mgmt & Archive
Document Services
Archive Services
Correspondence

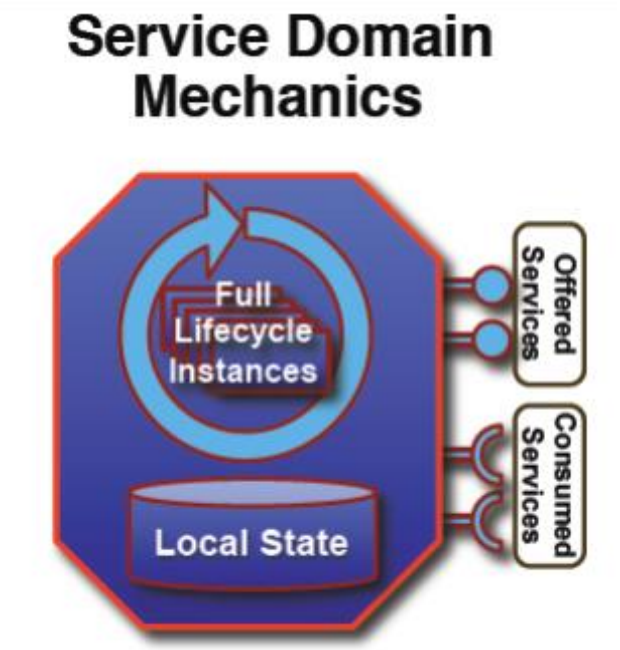
It is intended that the BIAN Service Landscape contains all possible BIAN Service Domains. Any business activity can be represented by a suitable collection of one or more BIAN Service Domains working together in collaboration. There are ~270 identified BIAN Service Domains of which ~210 can be identified as 'Core Banking functionality while the rest can be considered as 'Business Support Functions'. The current version of the BIAN Service Landscape (version 2.0) provides detailed descriptions of 63 BIAN Service Domains.

4.5 BIAN Service Domain Specifications

A BIAN Service Domain is designed to be 'elemental', meaning that it represents the smallest sensible service-enabled functional partition that supports a unique and discrete business role or purpose. All BIAN Service Domains taken together make up a 'peer set' that is arranged in the BIAN Service Landscape.

Some key BIAN Service Domain properties include:

- *A Unique Business Purpose* – a BIAN Service Domain has sole responsibility for fulfilling a specific and discrete business purpose
- *It is elemental* – it is not an assembly of other BIAN Service Domains. The full collection of BIAN Service Domains represent a 'peer' set of business capabilities
- *Collectively comprehensive* – all possible business activities can be modeled using BIAN Service Domains
- *Has a 'Focus Object'* – the focus object is a type of 'business object' that reflects the role or business purpose of the BIAN Service Domain. The focus object represents how the BIAN Service Domain exerts some type of control over some type of entity (e.g. handles the relationship contract for a customer)



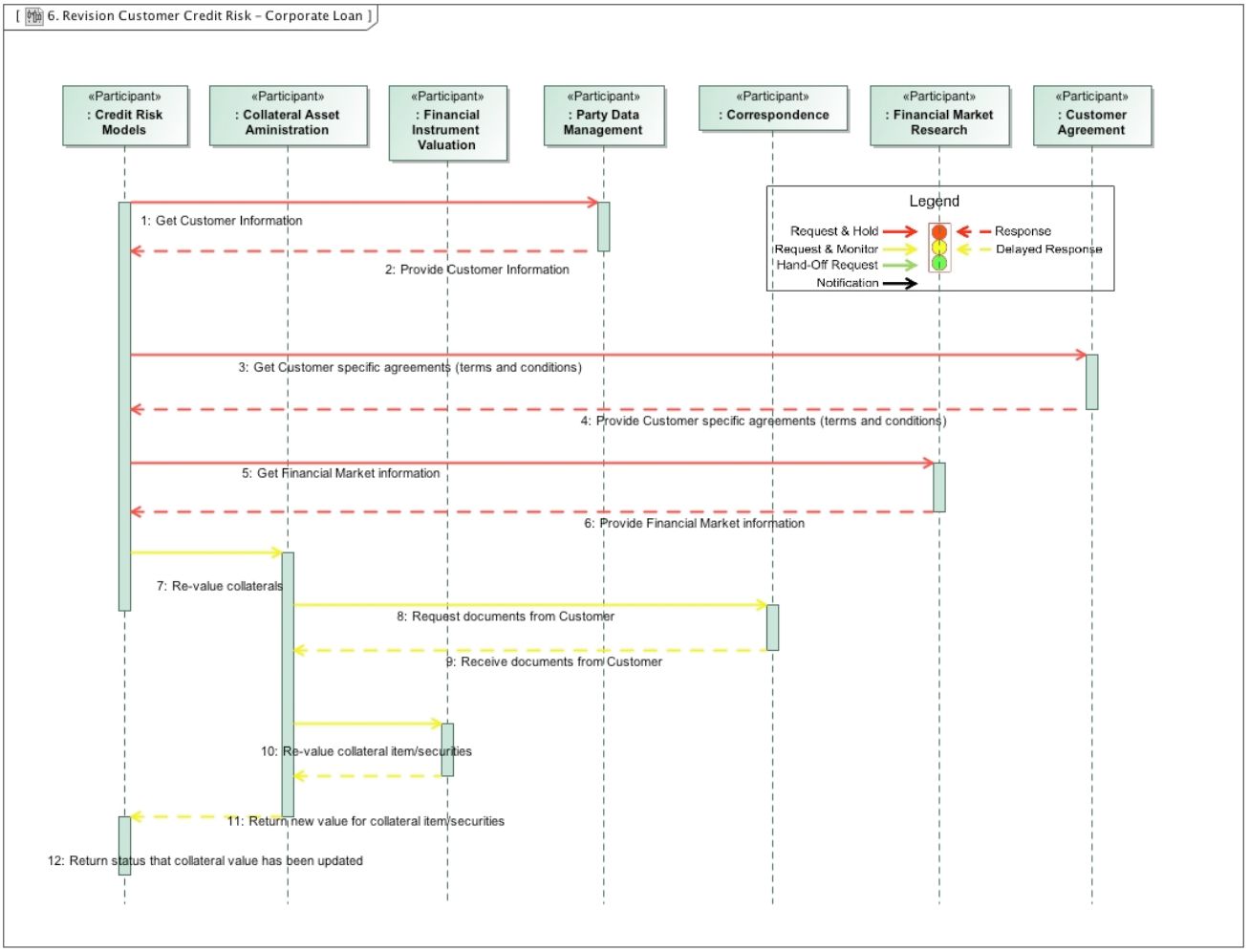
- *Full Life-Cycle Support* – the BIAN Service Domain is responsible for all possible states of its focus object or for its full 'life-cycle' (e.g. inception, maintenance, operation, reporting and eventual closure/termination)
- *Single or Multiple Instances* – depending on the role, a BIAN Service Domain may need to handle a single active instance or multiple active instances of its focus object (for example a single business unit plan, or multiple customer accounts)
- *Short or Long Life-Span* – the life-span of a focus object instance can be short such as a customer interaction, or long such as a product design
- *Service Based* – all interactions with the BIAN Service Domain are realized through Service Operations and all possible business activity can be modeled as a pattern of service interactions between a suitable selection of BIAN Service Domains

4.6 BIAN Business Scenarios

The BIAN Business Scenario is not a formal design or canonical artifact, but instead is a simple depiction, an example, of how selected BIAN Service Domains might work together for some business event. It is used to help visualize the roles and Service Operations of BIAN Service Domains by example. BIAN uses combinations of

BIAN Business Scenarios to clarify and explain the roles, boundaries and exchanges between BIAN Service Domains. The scope of a BIAN Business Scenario can be compared to that of a conventional high-level Business Process.

Below is an example of a simple BIAN Business Scenario.



5 TOGAF – The Leading Framework for Enterprise Architecture

This chapter provides an overview of TOGAF and the organization behind it, The Open Group. Its key focus areas are the Architecture Development Method (ADM), the TOGAF metamodel, and the TOGAF Content Framework.

5.1 The Open Group

The Open Group is a global consortium that enables the achievement of business objectives through IT standards. With more than 400 member organizations, The Open Group has a diverse membership that spans all sectors of the IT community – customers, systems and solutions suppliers, tool vendors, integrators, and consultants, as well as academics and researchers – to:

- Capture, understand, and address current and emerging requirements, and establish policies and share best practices
- Facilitate interoperability, develop consensus, and evolve and integrate specifications and open source technologies
- Offer a comprehensive set of services to enhance the operational efficiency of consortia
- Operate the industry's premier certification service

Further information on The Open Group is available at www.opengroup.org.

5.2 TOGAF as an Industry-Independent Framework for Enterprise Architecture

TOGAF Version 9.1 is an open, industry consensus framework and method for Enterprise Architecture.

TOGAF has been developed through the collaborative efforts of more than 300 Architecture Forum member companies from some of the world's leading companies and organizations. Using TOGAF results in Enterprise Architecture that is consistent, reflects the needs of stakeholders, employs best practice, and gives due consideration both to current requirements and to the perceived future needs of the business. TOGAF is focused on today's business needs and expectations as it:

- Is rooted in best practices.
- Is a generic framework for developing architectures to meet different business needs.
- Is customizable, not a "one-size-fits-all" framework.
- Considers most aspects of running an architecture practice.
- Incorporates business/IT alignment.
- Is an open standard that is vendor-, tool-, and technology-independent.

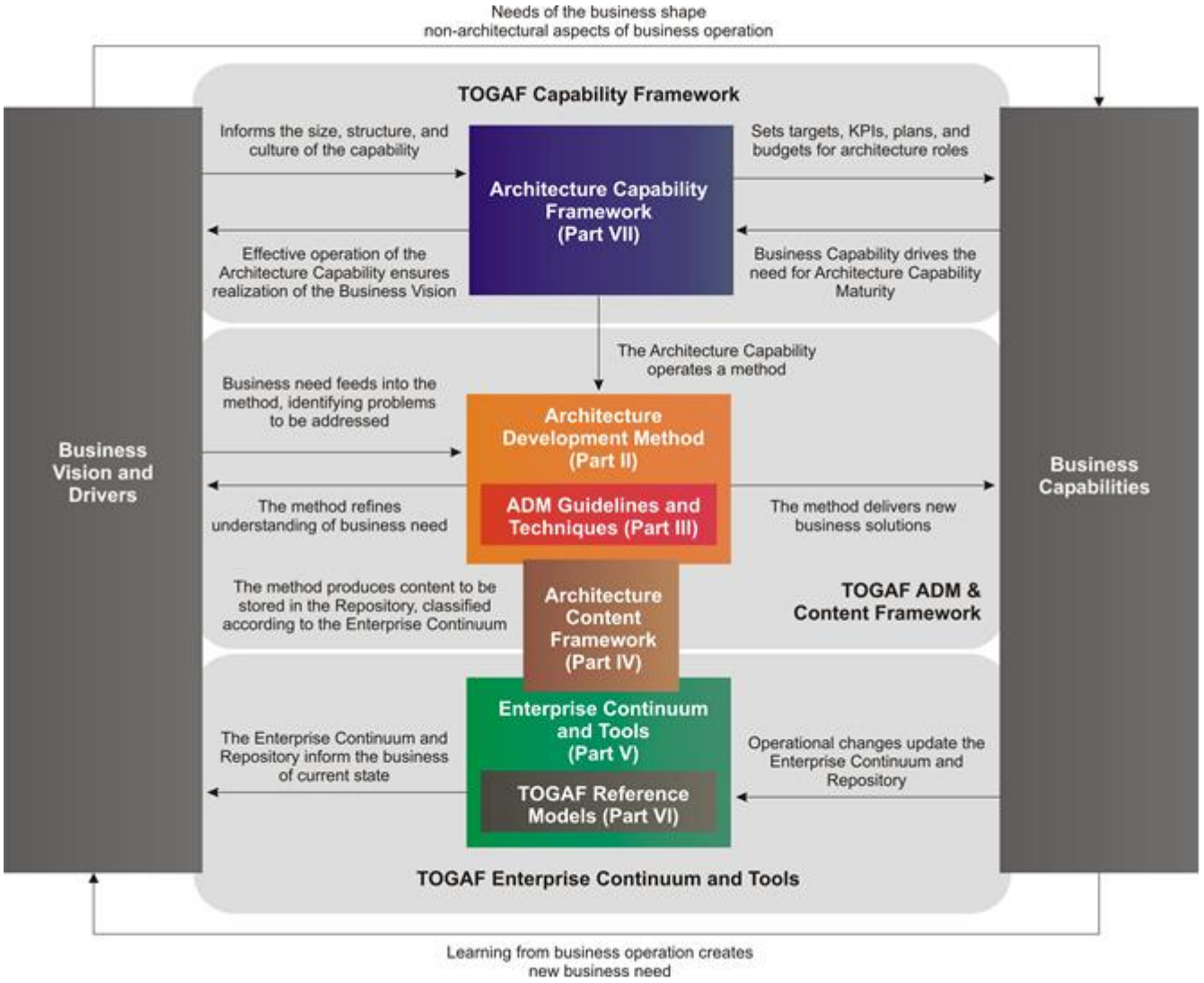
The TOGAF standard is industry-independent; it does not contain any 'vertical, industry-specific content. While this ensures wide applicability, it imposes a challenge to its users, as they will not find any abstractions specific to the business they are supporting.

5.3 Overview of TOGAF Components

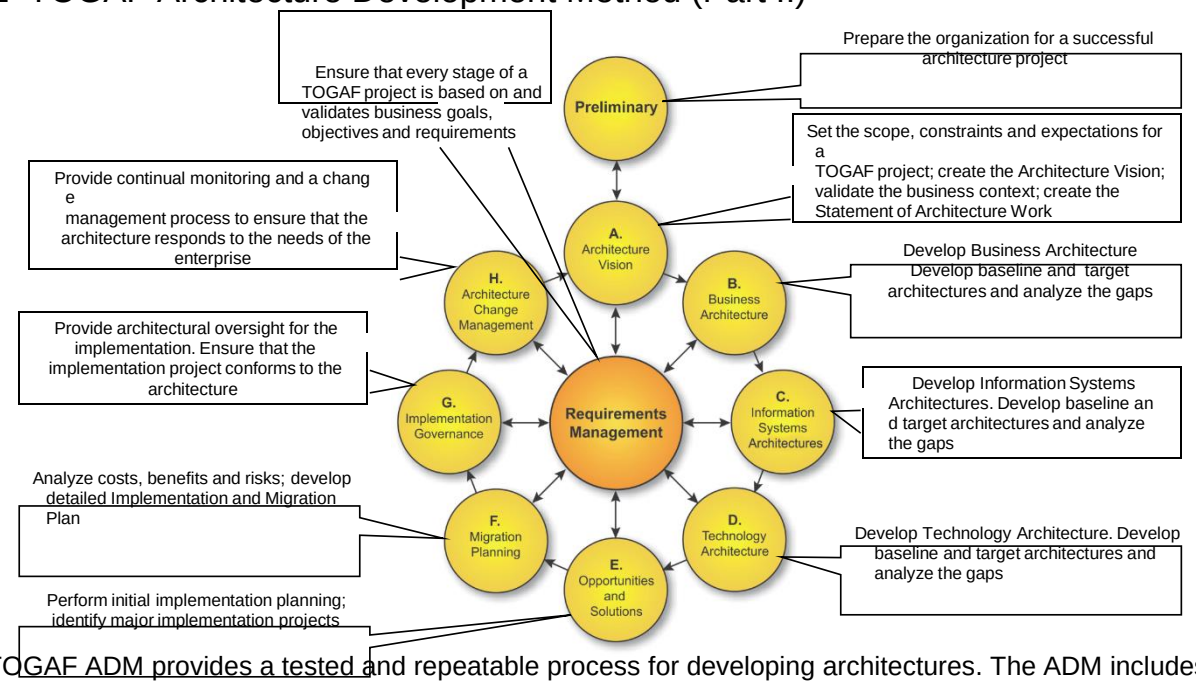
There are seven main parts in the TOGAF Version 9.1 document. Next to the introduction (Part I) the document covers the six main components of the TOGAF framework:

- The Architecture Development Method (ADM – described in Part II) is the core of TOGAF. It is a step-by-step approach to developing and managing enterprise architecture.

- The ADM Guidelines & Techniques (Part III) is a collection of approaches which support the implementation of TOGAF and the application of the TOGAF ADM.
- The Architecture Content Framework (Part IV) describes a framework for content used in an enterprise architecture initiative, including a structured metamodel for architectural artifacts, the use of re-usable architecture building blocks, and an overview of typical architecture deliverables.
- The Enterprise Continuum (Part V) is a taxonomy to categorize architectural artifacts within an enterprise. It forms the basis for defining an Architecture Repository.
- TOGAF Reference Models (Part VI) is a selection of technical architecture reference models, including the TOGAF Foundation Architecture, and the Integrated Information Infrastructure Reference Model (III-RM).
- The TOGAF Architecture Capability Framework (Part VII) discusses the organization, processes, skills, roles, and responsibilities required to establish and operate an architecture function within an enterprise.



5.3.1 TOGAF Architecture Development Method (Part II)



The TOGAF ADM provides a tested and repeatable process for developing architectures. The ADM includes establishing an architecture framework, developing an architecture for the organization, transitioning, and governing the realization of architectures. All of these activities are carried out within an iterative cycle of continuous architecture definition and realization that allows organizations to transform their enterprises in a controlled manner in response to business goals and opportunities.

The ADM is meant to be applied iteratively and in a non-linear fashion. Architecture is refined through multiple passes of the ADM cycle. Within an iteration, it may often be required to go back and forth between the phases, to elaborate further on deliverables sketched out earlier.

In executing the ADM, the architecture team not only develops a snapshot of the enterprise at particular points in time, it also populates the organization's Architecture Repository (see Section 5.3.3) with all the architectural assets identified and leveraged along the way. This not only comprises enterprise-specific architecture, but also artifacts used in the process (like the BIAN Service Landscape). Hence, over time, the architect gradually adds more and more content to the organization's Architecture Repository. In fact, the first execution of the ADM often is the hardest, since the architecture assets available for re-use are relatively scarce. BIAN provides both service definitions for the application landscape and a tentative structure of business, which can accelerate development significantly.

5.3.2 Architecture Content Framework (Part IV)

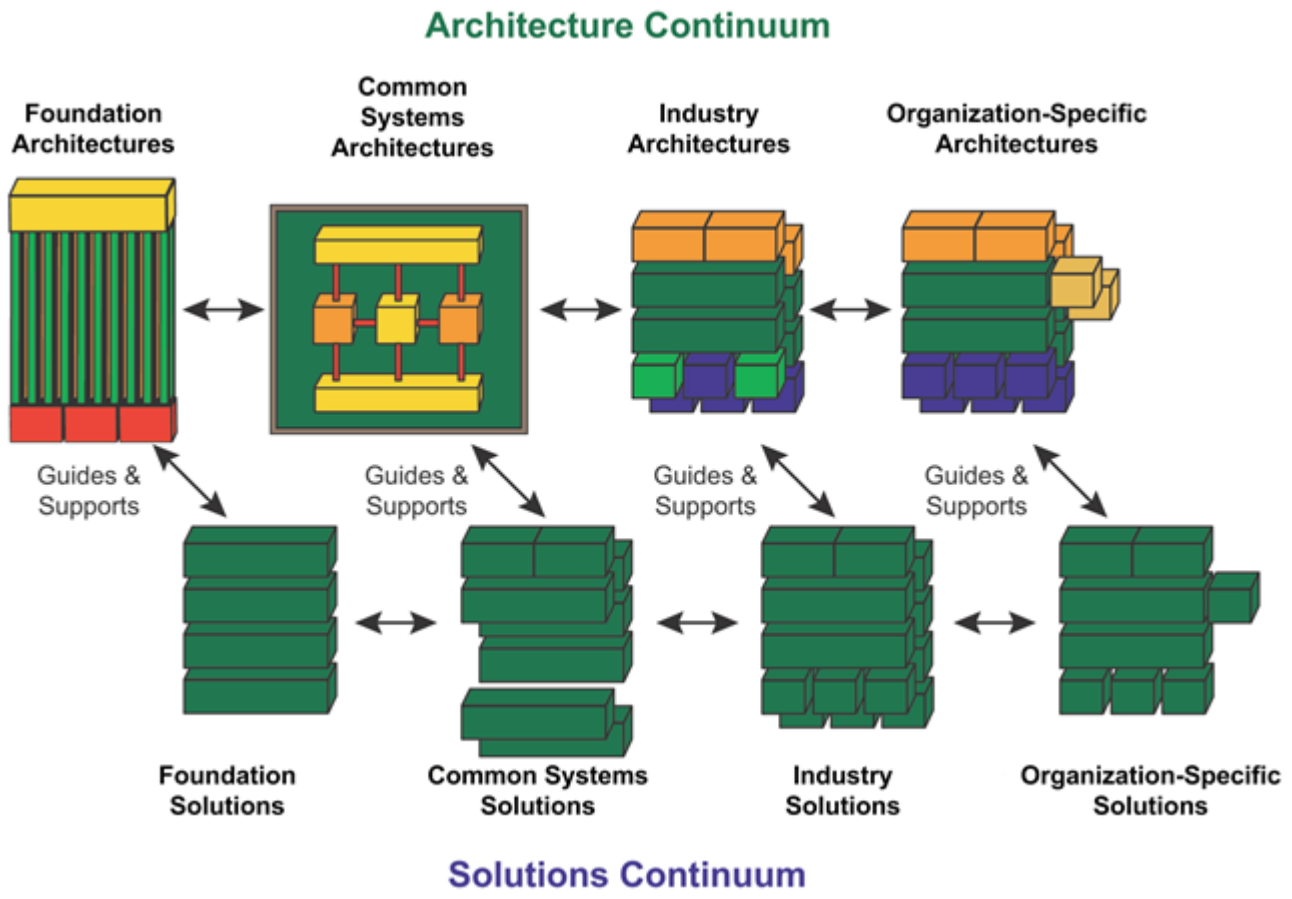
Architects executing the ADM produce a number of outputs such as process flows, architectural requirements, project plans, project compliance assessments, etc. The Content Framework provides a structured model for architectural content that allows the major work products that an architect creates to be consistently defined, structured, and presented.

This Content Framework may be extended or even replaced by another Content Framework; for example, mappings exist to use TOGAF for creating Frameworx/NGOSS-based architectures in the telecommunications industry, or for generating the DoDAF deliverables in the US Defense environment.

The integration with BIAN does not actually reach that far. The BIAN deliverables – in particular, the BIAN Service Landscape and the BIAN Business (Focus) Objects – provide industry-specific reference models as specific starting points for elements of the TOGAF Content Framework, in particular for the logical application and data components within the Information Systems Architecture. A detailed explanation is provided in Section 6.4.

5.3.3 TOGAF Enterprise Continuum (Part V)

Performing Enterprise Architecture generates as well as consumes a significant number of artifacts and deliverables; architecture and solution documents, as well as standards and architecture management documents. These are maintained in an Architecture Repository.



To provide a better overview of these assets, TOGAF suggests the Enterprise Continuum as a framework for structuring the content of this repository. It has two major dimensions of classification:

- The Specialization dimension describes how generic or specific an architecture or a solution is. On the left of the Architecture Continuum, it collects industry-neutral components (Foundation Architectures). Moving right, it combines these generic building blocks into certain patterns to address specific generic challenges in an IT landscape (Common System Architectures), like a security or operations architecture. Industry architectures address specific needs of vertical industries, and organization-specific architectures are re-usable artifacts with a scope and applicability of a specific organization. The Solutions Continuum represents the implementations of the architectures at the corresponding levels of the Architecture Continuum.
- The Architecture – Solution dimension differentiates between abstract architecture building blocks available for the organization and their instantiation as solution building blocks.

In this context, BIAN provides an Industry Architecture for the banking industry; i.e., assets which are bound to the banking industry, but applicable to multiple organizations, and at architecture level; i.e., which have to be instantiated to become a solution (Section 6.5).

6 Leveraging the BIAN Deliverables with TOGAF

6.1 Introduction

This chapter elaborates on the synergies of using BIAN in combination with TOGAF, by looking at TOGAF as the overall framework for architecture work and at BIAN as a pool of industry-specific architecture deliverables.. Based on that, BIAN deliverables are related to the TOGAF framework.

As to be expected, the BIAN deliverables have much ground in common with the TOGAF framework. In general, BIAN provides content in a specific structure. When applying TOGAF in a banking environment, BIAN content speeds up the work and improves quality. On the other hand, TOGAF facilitates architecture development work by providing a structured approach and a complete structure of relevant artifacts. Hence, TOGAF adds value to the BIAN deliverables especially for the project approach and capability to perform as well as by providing generic technology architectures.

Section 6.2 describes how BIAN deliverables can be used as input for the different ADM phases and how they influence the way of working within each phase. Section 6.3 relates the BIAN deliverables and philosophy to some specific guidelines and techniques that are relevant when applying the ADM cycle. Section 6.4 maps the BIAN deliverables on the TOGAF Content Framework and thus provides insight into which areas BIAN adds architecture content. Finally, Section 6.5 positions BIAN deliverables in the Enterprise Continuum to better understand the nature of BIAN deliverables in this respect.

TOGAF part VI (TOGAF Reference Models) and TOGAF part VII (Architecture Capability Framework) are not covered here: TOGAF part VI only relates to technology architectures, whereas BIAN only provides Business and Information Systems Architecture deliverables. With respect to TOGAF part VII, BIAN does not provide

deliverables related to establishing and operating an architecture function within an enterprise.

6.2 Relating BIAN to the Phases of the ADM (Part II)

This section describes where the availability and use of BIAN deliverables influences the way the TOGAF ADM phases are performed. Each chapter refers to the related chapter of the TOGAF Version 9.1 document.

For each TOGAF ADM phase, only those BIAN deliverables are included that are direct input for that ADM phase. Since the impact of those BIAN deliverables is fully integrated in the output of that ADM phase, the influence on later ADM phases is fully covered.

Applying the TOGAF ADM produces and enriches the BIAN Service Landscape and BIAN Business Scenarios specific to the organization. The results could further be consolidated back to the BIAN community to extend and enrich the BIAN deliverables.

6.2.1 Preliminary Phase (Chapter 6)

This Preliminary Phase is about defining "where, what, why, who, and how we do architecture" in the enterprise concerned.

This phase considers:

- That the existence of the BIAN network contributes to the awareness and acceptance of an architectural approach and in that sense can be used to create sponsorship and general commitment for the approach
- That the use of the BIAN SOA Design Framework and related deliverables may be prescribed by the architecture
- Whether or not to use BIAN input and principles during the architecture work

6.2.2 Architecture Vision (Phase A, Chapter 7)

This phase is about validating starting points, defining the scope and approach of the architecture development cycle, and recognizing key success factors.[8]

- Relate the architecture development cycle to the use of BIAN deliverables. In the first instance, a decision has to be made regarding the relevance and fitness-for-purpose of the BIAN deliverables for this architecture engagement.
- The parts of the BIAN Service Landscape and BIAN Business Scenarios that are relevant for the project can be used to identify possible stakeholders.
- The BIAN Service Landscape can also be used to identify other architecture developments in related areas of the organization.
- When using BIAN, certain re-use requirements may be applicable.

6.2.3 Business Architecture (Phase B, Chapter 8)

The main objectives of Phase B are to describe the Baseline Business Architecture, to develop a Target Business Architecture, and to identify the gaps.

- The BIAN Business Scenarios can be used as a starting point, as an example, in describing the Baseline Business Architecture and defining the Target Business Architecture. The scope of a BIAN Business Scenario can be compared to that of a conventional high-level Business Process. The BIAN Business Scenarios are an example of how some BIAN Service Domains might collaborate together in response to a business event. BIAN Business Scenarios can be matched to the internal (Baseline and Target) processes at a bank and the BIAN Service Domains and their associated Service Operation boundaries can be used as an assessment framework. As noted previously, the BIAN Business Scenarios are indicative and in matching them to a specific location their sequencing and content may need to be changed to reflect the prevailing business rules and practices.
- The BIAN Service Landscape is structured according to a common reference hierarchy: a business breakdown in Business Areas and Business Domains. Although not a Target Business Architecture[9] in itself, the BIAN Service Landscape can be used as a starting point (or at least be used as a source of inspiration) next to the BIAN Business Scenarios for the set-up of the Target Business Architecture.
- As the BIAN Service Landscape is directly derived from the business breakdown, and validated via the BIAN Business Scenarios, it should be clear where the set-up of the Target Business Architecture deviates from this breakdown. This insight is needed to apply the BIAN Service Landscape in Phase C.

6.2.4 Information Systems Architecture (Phase C, Chapter 9)

The objective of Phase C is to develop Target Architectures for the data and/or the application systems domains, and identify the gaps between the Baseline and the Target Architecture. Information Systems Architecture focuses on identifying and defining the applications and data considerations that support an enterprise's Business Architecture. It does so by defining views that relate to information, knowledge, application services, etc.

- BIAN provides the BIAN Service Landscape specific to the banking industry, constructed of re-usable building blocks related to application components and data entities. As such, the BIAN Service

[8] In the Architecture Vision phase, TOGAF suggests to "evaluate business capabilities". Although BIAN also uses the term capability, the underlying concept of a capability in BIAN (the ability to fulfill a responsibility that supports a specific aspect of business) is quite different in scope and nature from the capability term in TOGAF (as derived from a capability-based planning perspective). Hence, due to their granularity, BIAN "capabilities" are typically not an outcome of Phase A, but rather of Phase B or C.

[9] A Target Business Architecture Framework will be part of future releases of the BIAN Service Landscape.

Landscape can be used as a reference point for defining or assessing the Target Application Architecture of the organization. Its breakdown into Business Areas, Business Domains, and BIAN Service Domains can be applied to structure the application landscape. The principles applied in constructing the BIAN Service Landscape can be translated into application and data principles for the organization.

- A core activity is to relate the identified BIAN service operations on the target application level to the Target Business Architecture (developed in Phase B), to recognize the relationship between business processes and applications, and to analyze the relation between business objects and data. Especially the BIAN Business Scenarios can support this mapping activity. Also the mapping of the main BIAN deliverables on the TOGAF Content Metamodel (see Section 6.4) supports the execution of this activity.
- The other way around, the BIAN initiative could benefit from this phase by updating the BIAN Service Landscape and BIAN Business Scenarios with the output of this analysis; e.g., the split-up or repositioning of a certain Service, or the (updated) execution of a (new) business process.

6.2.5 Technology Architecture (Phase D, Chapter 12)

The Technology Architecture phase seeks to map application components defined in the Information Systems Architecture phase onto a set of technology components.

- Since the BIAN service definitions are implementation-independent, BIAN does not contribute to this phase directly. However, the result of Phase C will certainly contain specific technical requirements coming from the BIAN service interfaces. (Note that BIAN service operations will be related to other standards such as ISO, IFX, etc., which may imply specific technology components.)

6.2.6 Opportunities and Solutions (Phase E, Chapter 13)

This phase generates an architecture roadmap, which delivers the target architecture. This typically includes deriving a series of Transition Architectures that deliver continuous business value (i.e., capability increments).

- The BIAN Service Landscape and other BIAN deliverables are created in co-operation with software vendors serving the banking industry. Hence it is fair to assume that BIAN services leveraged in previous ADM phases will also be (in due time) physically available in the market as COTS software solutions or application components.
- The BIAN Service Landscape and BIAN Business Scenarios can also be used in requirements gathering and vendor and package selections, assessing the compliance of vendors and products with these BIAN deliverables. Compliance of products to the BIAN Service Landscape and BIAN Business Scenarios will increase the seamless integration of the software products in an existing (BIAN-compliant) target Business and Application Architecture and thus reduce integration cost.
- BIAN service landscape and business scenarios can be used as enablers for designing COTS products in the financial industry space.

6.2.7 Migration Planning (Phase F, Chapter 14)

The objectives of Phase F are to finalize the Architecture Roadmap and the detailed Implementation and Migration Plan.

- There are no specific BIAN deliverables that are direct input for this ADM phase. All relevant BIAN input is included in the output of previous ADM phases.

6.2.8 Implementation Governance (Phase G, Chapter 15)

The goal of this phase is to govern and manage the implementation and deployment process.

- There are no specific BIAN deliverables that are direct input for this ADM phase. All relevant BIAN input is included in the output of previous ADM phases.

6.2.9 Architecture Change Management (Phase H, Chapter 16)

The goal of this phase is to establish an architecture change management process for the new enterprise architecture baseline.

- There are no specific BIAN deliverables that are direct input for this ADM phase. All relevant BIAN input is included in the output of previous ADM phases. However, the tracking of BIAN changes and initiatives should be incorporated in the architecture change management.

6.2.10 Requirements Management (Chapter 17)

The goal of requirements management is to define a process whereby requirements for enterprise architecture are identified, stored, and fed into and out of the relevant ADM phases.

- Leveraging BIAN deliverables in the ADM would guide and structure the capturing of requirements, in particular along the BIAN Service Landscape (including its Business Areas and Business Domains) and BIAN Business Scenarios.

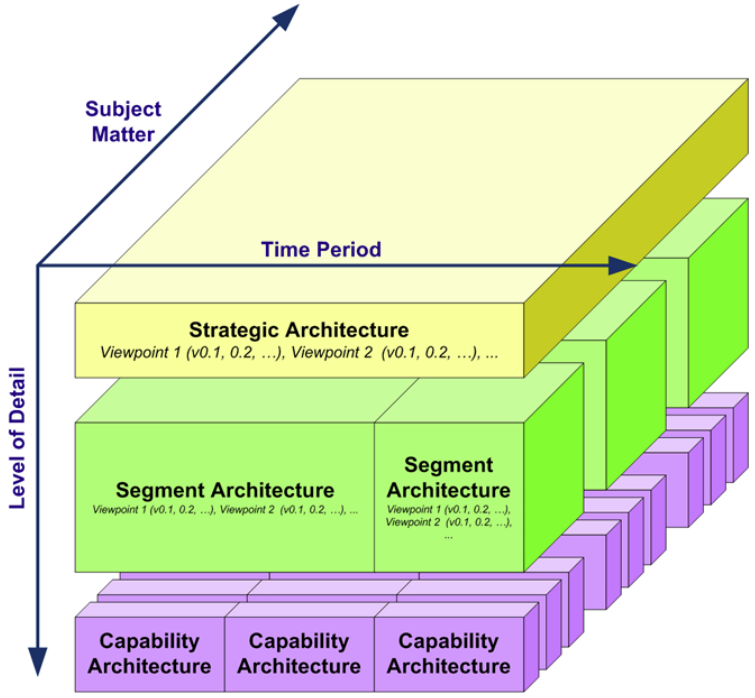
6.3 Relating BIAN to TOGAF Guidelines and Techniques (Part III)

This section focuses on specific guidelines and techniques related to the ADM cycle that are relevant when using BIAN deliverables in an architectural engagement. The chapters mentioned refer to the related chapters in the TOGAF Version 9.1 document.

6.3.1 Applying the ADM at Different Enterprise Levels (Chapter 20)

The ADM is intended to be used as a model to support the definition and implementation of architecture at multiple levels within an enterprise.

In general, it is not possible to develop a single architecture that addresses all needs of all stakeholders. As can be seen from the graph below, an enterprise can be partitioned into different areas, according to “Subject Matter”, “Time Period”, and “Level of Detail”.



The BIAN Service Landscape and BIAN Business Scenarios are especially useful in:

- The definition and/or assessment of the Target Architectures, especially Business and Information Systems Architectures (Application and Data) and the related definition of change from baseline to target
- The assessment and selection of COTS solutions in the market, aimed at achieving compliance with BIAN deliverables and thus reducing integration cost

The BIAN Service Landscape is based on SOA principles. It uses a hierarchical decomposition of the business in terms of Business Areas and underlying Business Domains. BIAN Business Scenarios and the Business Domains from the BIAN Service Landscape might serve as a source of inspiration to define “segments” and their relations (cooperation). Per Business Domain, the relevant BIAN Service Domains are recognized and described. This is more related to the “capability architecture” level; however, BIAN does not provide the overall architectural insight at all levels of an organization (Company – Business Unit – Division – Department – ...).

6.3.2 Using TOGAF to Define and Govern SOAs (Chapter 22)

This chapter discusses the factors related to the adoption and deployment of SOA within the enterprise.

- The BIAN Business Scenarios can be a good vehicle to introduce the BIAN service oriented designs. They are first used in a manner similar to a conventional Business Process, representing the flow of activity associated with a familiar business event in a form that can easily be recognized and understood. The same BIAN Business Scenario representation can then be used to explain the concept of BIAN Service Domains by exposing the discrete role each plays in handling the selected business event.
- The BIAN Service Landscape is based on SOA principles. Hence, the architect should be aware whether and how SOA is leveraged within the organization. Where necessary, the architecture engagement should include activities required to apply SOA principles in the organization.
- To be effective, it is necessary to align TOGAF and BIAN terminology beforehand.

6.3.3 Architecture Principles (Chapter 23)

This chapter describes principles for use in the development of an enterprise architecture.

The definition of a principle is: “a qualitative statement of intent that should be met by the architecture”. This applies to principles:

- That govern the architecture process.
- Which are affecting the development, maintenance, and use of the enterprise architecture.
- That govern the implementation of the architecture.

BIAN has developed various design rationales and supporting design techniques, mainly in order to define a BIAN Service Domain. Examples are:

- BIAN Service Domain Operational properties: Clearly bounded and unique business purpose, focus object record with full life-cycle handling of its focus object, exclusively service-based, loose coupled and location independent.
- BIAN Service Domain Design techniques: Right-sizing the BIAN Service Domain’s focus objects; assigning a single functional pattern; confirming its role through BIAN Business Scenarios.

Not all BIAN design principles are canonical and fully and explicitly described in the BIAN Metamodel. As the construction of the BIAN Service Landscape is based on these specific design principles, it is important to make them explicit during the execution of the different ADM phases.

6.3.4 Architecture Patterns (Chapter 25)

In TOGAF a "pattern" is defined as: "an idea that has been useful in one practical context and will probably be useful in others".

- Patterns describe how, when, and why building blocks can be applied, and which trade-offs have to be made in doing so. In that sense, BIAN can be used as an additional source for best practices. In particular, the BIAN Business Scenarios describe typical patterns of service usage and service interaction. Additionally, the how-to guide associated with the BIAN Service Landscape provides patterns for service design.

6.3.5 Interoperability Requirements (Chapter 29)

Defining the degree to which the information and services are to be shared.

- This is a very useful architectural requirement, especially in a complex organization and/or extended enterprise and key in BIAN's focus. BIAN provides guidelines (in terms of structure with the business landscape or BIAN Service Domain design principles) and content (the BIAN Business Scenarios) that should be met with respect to interoperability.

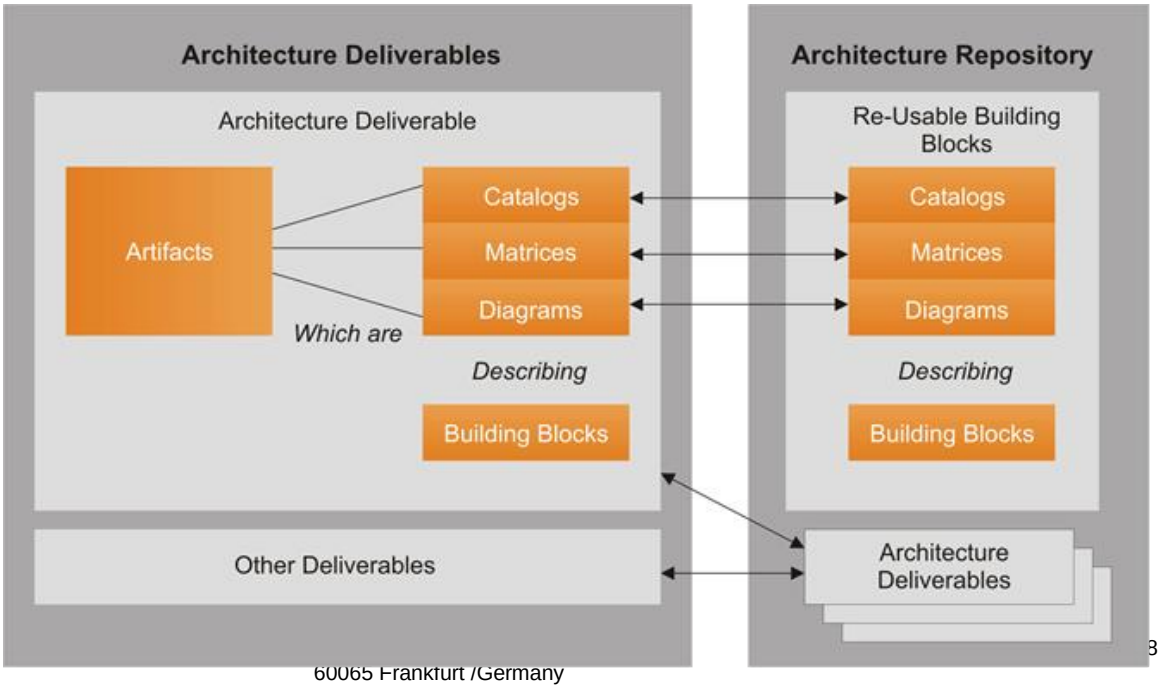
6.4 BIAN and the TOGAF Architecture Content Framework (Part IV)

The TOGAF Architecture Content Framework consists of the relevant artifacts produced in the ADM cycle. As shown earlier, the use of BIAN is relevant to several phases of the ADM (Section 6.2). These dependencies make it straightforward to map the BIAN deliverables onto the TOGAF Content Metamodel.

It may be noted that only the specific BIAN deliverables are mapped that are direct input in an ADM phase. This means that not all parts of the TOGAF metamodel are related to specific BIAN deliverables.

6.4.1 Deliverables, Artifacts, and Building Blocks

The figure below shows the relations between the different concepts (Deliverables, Artifacts, and Building Blocks) in TOGAF. Building Blocks refer to descriptions of specific parts of an architecture. They are devised in architecture building blocks and solution building blocks.



BIAN focuses on those IT services relevant to the banking industry. The structure is based on a common understanding of the business and systems in use. The BIAN Business Scenarios are used to validate the completeness of the Service Landscape.

In TOGAF terminology, the BIAN Service Landscape is a structured description of the various architecture building blocks needed to provide the required capabilities in the banking industry.

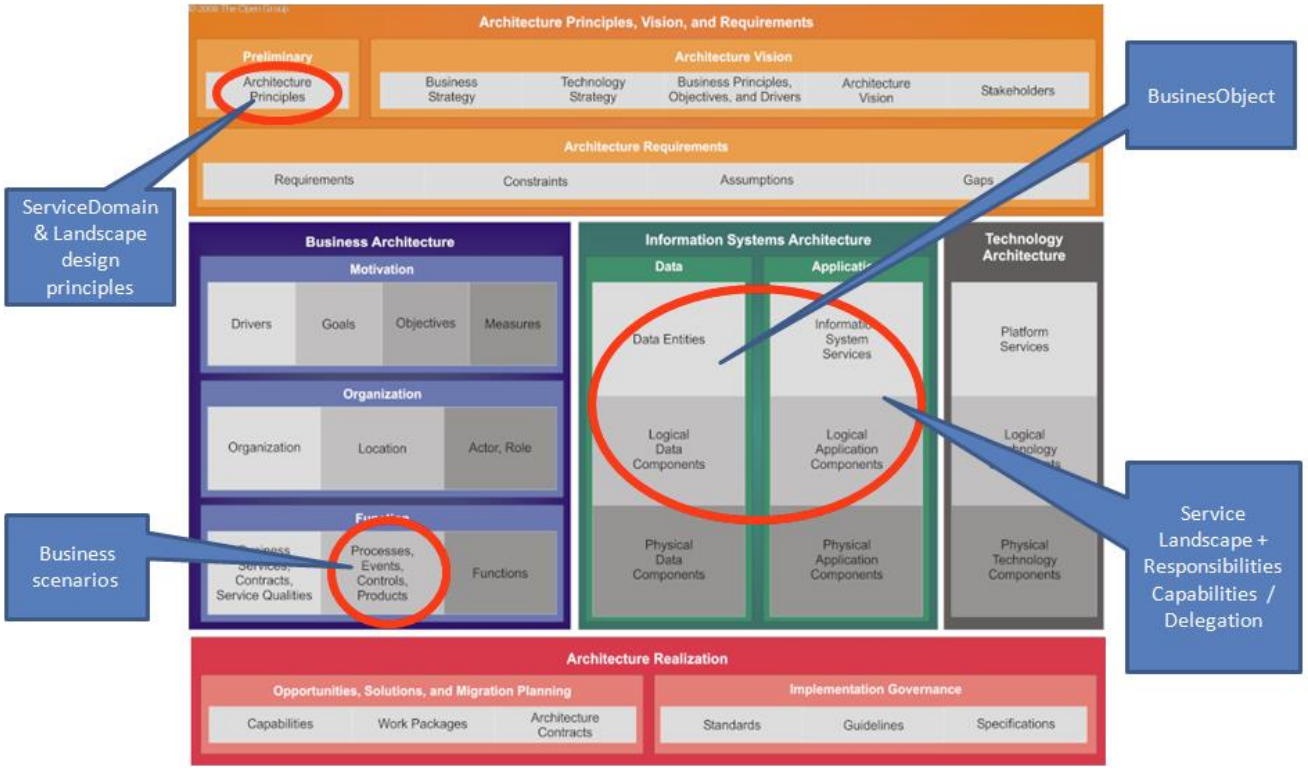
6.4.2 Mapping the BIAN Deliverables to the TOGAF Content Metamodel

The following BIAN deliverables can be mapped onto the TOGAF Content Metamodel: BIAN Service Domain principles ensure consistency within a Business Domain.

- BIAN Business Scenarios used to validate the BIAN Service Landscape and to ensure completeness, may be used as best practice process templates.
- BIAN focuses on application-to-application integration relevant for the various logical application components.
- BIAN service definitions are canonical, implementation-independent descriptions of logical components; hence, physical and technical layers are out of scope.
- BIAN Services are clustered around focus objects and manage their full life-cycle.
- Focus objects are relevant to logical Data Architecture.

Using BIAN deliverables in an architecture engagement may require a TOGAF Content Metamodel extension with respect to the BIAN Service Landscape and BIAN Business Scenarios. The services extension is intended to allow more sophisticated modeling of the service portfolio by creating a concept of IT services in addition to the core concept of business services.

The following picture shows the mapping of BIAN deliverables onto the TOGAF Content Metamodel. See the detailing in the following sections.



BIAN Service Domain and Landscape Design Principles

The BIAN Service Landscape is based on a set of design principles. These design principles map smoothly to the architecture principles allocated in the TOGAF Content Metamodel.

BIAN Business Scenarios

BIAN has defined the Business Scenario as a model/example of how some BIAN Service Domains might collaborate together in response to a business event. BIAN models BIAN Business Scenarios in order to discover, validate, and explain the canonical definitions of BIAN Service Domains and their elements. But the scenarios themselves are not canonical, because a bank that uses BIAN must have flexibility in how it combines the BIAN Service Domains to execute its business. A BIAN Business Scenario is an example of an archetypical flow; the sequence as modeled can change in practice.

The BIAN Business Scenario may be mapped onto processes where a process represents the flow of control between or within functions and/or services (depending on the granularity of definition). Processes represent a sequence of activities that together achieve a specified outcome, can be decomposed into sub-processes, and can show the operation of a function or service (at the next level of detail).

Business Objects

Business objects play a fundamental role in the definition of BIAN Service Domains, as each BIAN Service Domain has one focus object whose instances it uniquely owns and whose life-cycle it manages.

BIAN Business Objects may be mapped on the following high-level TOGAF Metamodel entities:

- Data Entity: An encapsulation of data that is recognized by a Business Domain expert as “a thing”. Logical data entities can be tied to applications, repositories, and services and may be structured according to implementation considerations.
- Logical Data Component: A boundary zone that encapsulates related data entities to form a logical location to be held; for example, external procurement information.

Because the BIAN business objects are independent of any implementation, they cannot be mapped onto a physical data component.

BIAN Service Landscape

BIAN aims to address application-to-application integration issues. The BIAN Service Landscape is a coherent set of IT logical capabilities/functionalities that are recognized by the business.

This corresponds well to the TOGAF definition described in TOGAF Section 34.4.2 (Services Extensions, Purpose): “The services extension is intended to allow more sophisticated modeling of the service portfolio by creating a concept of IS services in addition to the core concept of business services. IS services are directly supported by applications and creating the layer of abstraction relaxes the constraints on business services whilst simultaneously allowing technical stakeholders to put more formality into an IS service catalog in TOGAF”.

This TOGAF service catalog may be considered as a generalization of the catalog of BIAN Service Domains or service operations.

For these reasons, the BIAN Service Landscape elements can be interpreted as being:

- Logical Application Component: “An encapsulation of application functionality that is independent of a particular implementation. For example, the classification of all purchase request processing applications implemented in an enterprise.”
- Application Service: “The automated elements of a business service. An information system service may deliver or support part or all of one or more business services.”

Because the BIAN IT services are independent of any implementation, BIAN does not provide any physical application component (in the sense of “an application, application module, application service, or other

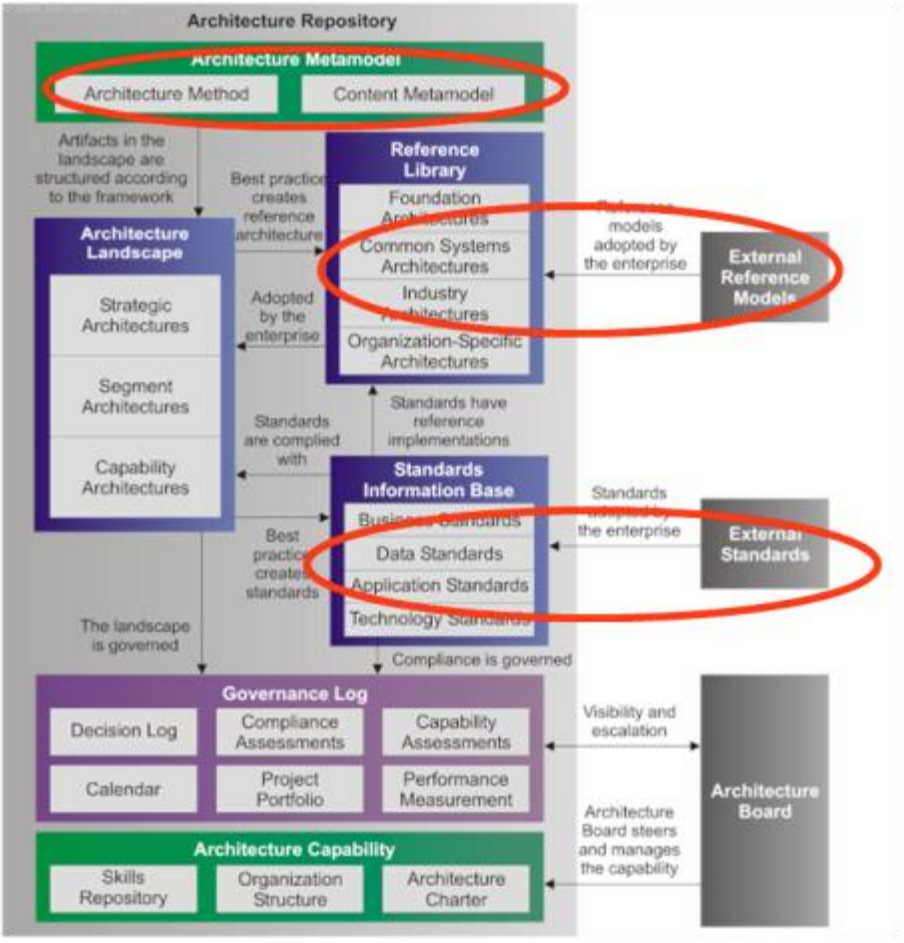
deployable component of functionality"). However, software vendors or software development organizations may provide software components that comply with the BIAN standards, and that can be implemented in the IT landscape.

6.5 BIAN and the TOGAF Enterprise Continuum (Part V)

Related to the TOGAF Enterprise Continuum, BIAN content can be seen as an industry-specific architecture within the Architecture Continuum (Section 5.3.3). As BIAN Business Scenarios, the BIAN Service Landscape and service definitions are implementation-independent, they are not related to the Solution Continuum.[10]

Looking at the Architecture Repository containing all architectural deliverables (see the figure below), BIAN contributes by providing a banking industry-specific reference model (red circles in the picture).

It contains a Common Systems Architecture as well as data standards and application standards relevant for the architecture. All of these BIAN deliverables can be included in the Architecture Repository or treated as external references and models. In addition, BIAN developed and published a metamodel for the BIAN Service Landscape which can be considered an architecture metamodel in the context of the Architecture Repository.

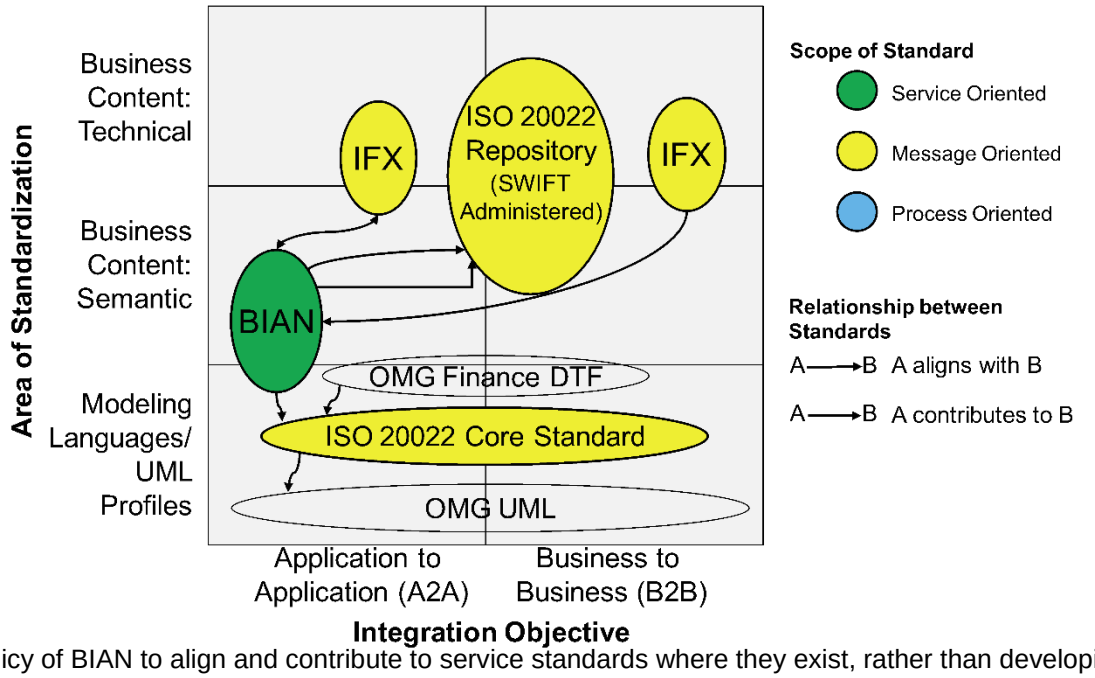


[10] Still, describing structures like the SOA architecture style is actually defining properties of the Solution Continuum.

7 Other Relevant Standards for the Banking Industry

7.1 Alignment of BIAN with Other Technical, Semantic, and Messaging Standards

BIAN is the first banking standards body to define semantic service standards with specific focus on internal A2A activity. Hitherto the majority of the standardization activity has focused on B2B requirements at a lower "implementation" level. The following diagram shows how BIAN is positioned alongside a number of other standards groups that are active in Financial Services.



It is the policy of BIAN to align and contribute to service standards where they exist, rather than developing competing standards. BIAN has and will continue to test and confirm that its semantic standards can be mapped to existing standards as appropriate. In particular, BIAN seeks to maintain close alignment and integration with the ISO 20022 standard initiative.

- BIAN's Application-to-Application (A2A) focus differs from others where B2B or company-to-company is typically the priority.
- BIAN's standards are implementation-independent, semantic service definitions that can be interpreted or mapped to implementation-level standards and proprietary solutions.
- BIAN, IFX, and the OMG Finance Domain Task Force recognize ISO 20022 and the SWIFT administered ISO 20022 Repository as core to alignment of standards initiatives in the financial services industry.
- BIAN employs a service center approach to SOA.

8 Glossary

A2A: Application to Application

Architecture Content Framework [TOGAF]: Provides a structural model for architectural content that allows major work products to be consistently defined, structured, and presented.

Architecture Content Metamodel [TOGAF]: Defines a set of entities and relationships that allows architectural concepts to be, captured, stored, fltered, queried and represented in a way that supports consistency, completeness and traceability.

Architecture Repository [TOGAF]: Can be used to store different classes of architectural output at different levels of abstraction, created by the ADM.

ADM/Architecture Development Method [TOGAF]: Forms the core of TOGAF and is designed to address enterprise business and IT needs by providing a set of architecture views, guidelines on tools for architecture development, a set of recommended deliverables, and a method for managing requirements.

B2B: Business to Business

BA/Business Area [BIAN]: Formed by a broad set of capabilities and responsibilities and an element at the highest level of the hierarchy when decomposing the functions of financial institutions. This decomposition is primarily driven by the business understanding and complemented by application and information-specific needs.

BD/Business Domain [BIAN]: A coherent set of capabilities and responsibilities. It is an element of the functional decomposition of the banking business functions in the context of the BIAN Service Landscape. Business Domains are linked to certain skills and knowledge, which are clearly identifiable in the banking business.

BIAN/Banking Industry Architecture Network [BIAN]: A not-for-profit organization which seeks to accelerate the adoption of Service-Oriented Architecture (SOA) in the banking industry. It does so by promoting convergence towards a common service landscape, and by providing semantic standards which makes it easier and more cost-effective to integrate such services (www.bian.org).

Capability [BIAN]: Within The Open Group, a capability is defined as “an ability to do something”. A business capability represents the ability for a business to do something. A more formal definition is as follows:

A business capability is a particular ability or capacity that a business may possess or exchange to achieve a specific purpose or outcome. Critically, a business capability delineates what a business does without attempting to explain how, why, or where the business uses the capability. As part of the practice of business architecture, we separate the concern of what we do from who does it within the organization and from how the business achieves value from that activity. A business capability can be something that exists today or something that is required to enable a new direction or strategy. When integrated into a business capability model, business capabilities represent all of the abilities that an enterprise has at its disposal to run its business.

Capacity [BIAN]: The direct fulfillment of a responsibility by a BIAN Service Domain. It sets out the main actions supported corresponding to generic stages in the life-cycle of the BIAN Service Domain’s focus object (e.g., tasks to set up/update a new instance of the focus object, maintenance tasks, access/invocation tasks, analysis, reporting, and archiving tasks).

COTS/Commercial Off-The-Shelf: Pre-packaged software product, ready to be used “as-is”.

EC/Enterprise Continuum [TOGAF]: A view of the Architecture Repository that provides methods for classifying architecture and solution artifacts as they evolve from generic Foundation Architectures to Organization-Specific Architectures. The Enterprise Continuum comprises two complementary concepts – the Architecture Continuum and the Solutions Continuum.

Focus Object [BIAN]: A type of business object, representing a record (which may be machine-representable), for which an instance of the BIAN Service Domain manages the complete life-cycle (initialization, maintenance, execution, reporting, and termination) in fulfilling its business purpose.

IFX (Interactive Financial eXchange forum): A content-rich financial messaging protocol built by financial industry and technology leaders. IFX is a consistent framework incorporating best-of-breed design principles, a common object model, and a service-oriented architecture that accounts for the interactions among those objects and related data definitions.

ISO 20022: Provides the financial industry with a common platform for the development of messages using a UML-based modeling methodology, a central dictionary of business items used in financial communications, and a set of XML design rules to convert the messages described in UML into XML schemas.

SaaS (Software as a Service): Sometimes referred to as "on-demand software," is a software delivery model in which software and its associated data are hosted centrally (typically in the Cloud) and are typically accessed by users using a thin client, normally using a web browser over the Internet.

SD/BIAN Service Domain [BIAN]: Has a unique business purpose and manages an artifact or record of its execution. The BIAN Service Domain represents the finest-grained design building block, encapsulating its functionality behind a semantic service boundary.

SOA/Service-Oriented Architecture: An architectural style in which the functionality of an application is exposed (for re-use) via a well-defined interface.

TCO/Total Cost of Ownership: A method to determine direct and indirect costs of a product or system throughout the life-cycle.

TOGAF [TOGAF]: An industry standard architecture framework that may be used freely by any organization wishing to develop an Information Systems Architecture for use within that organization (www.opengroup.org/togaf).

9 APPENDIX: The BIAN Metamodel

The concepts described in Chapter 4 (Business Area, Business Domain, etc.) as well as their relationships are formalized in the BIAN Metamodel. They are structured in packages and viewpoints. Within the scope of this White Paper, the following viewpoints are the most relevant:

- Service Landscape Viewpoint: Highlights key elements of the service landscape.
- Business Object Viewpoint: Describes business objects and their attributes as related to BIAN Service Domains.
- Message Viewpoint: Messages play a fundamental role in the definition of ServiceOperations, as a ServiceOperation may have an input message, may have an output message, and must have a fault message.
- Scenario Viewpoint: BIAN Business Scenarios are not a formal design or canonical, but instead are a simple depiction, an example, of how selected BIAN Service Domains might work together for some business event. It is used to help visualize the roles and Service Operations of BIAN Service Domains by example. BIAN uses BIAN Business Scenarios internally to help identify and specify BIAN Service Domains.

The BIAN Metamodel is an extension of the ISO 20022 metamodel. It also has a generic mechanism to relate Service Landscape content to content in other standards repositories.

9.1 Service Landscape Viewpoint

To reap the benefits of the agility and interoperability promises of SOA, implementation independence is a key aspect. BIAN therefore headed towards getting a consensus on a common logical functional landscape, consisting of coherent sets of logical capabilities/functionalities. It is called the BIAN Service Landscape (and not IT function landscape) to emphasize its role as a framework for supporting the definition and management of the BIAN Service Operations.

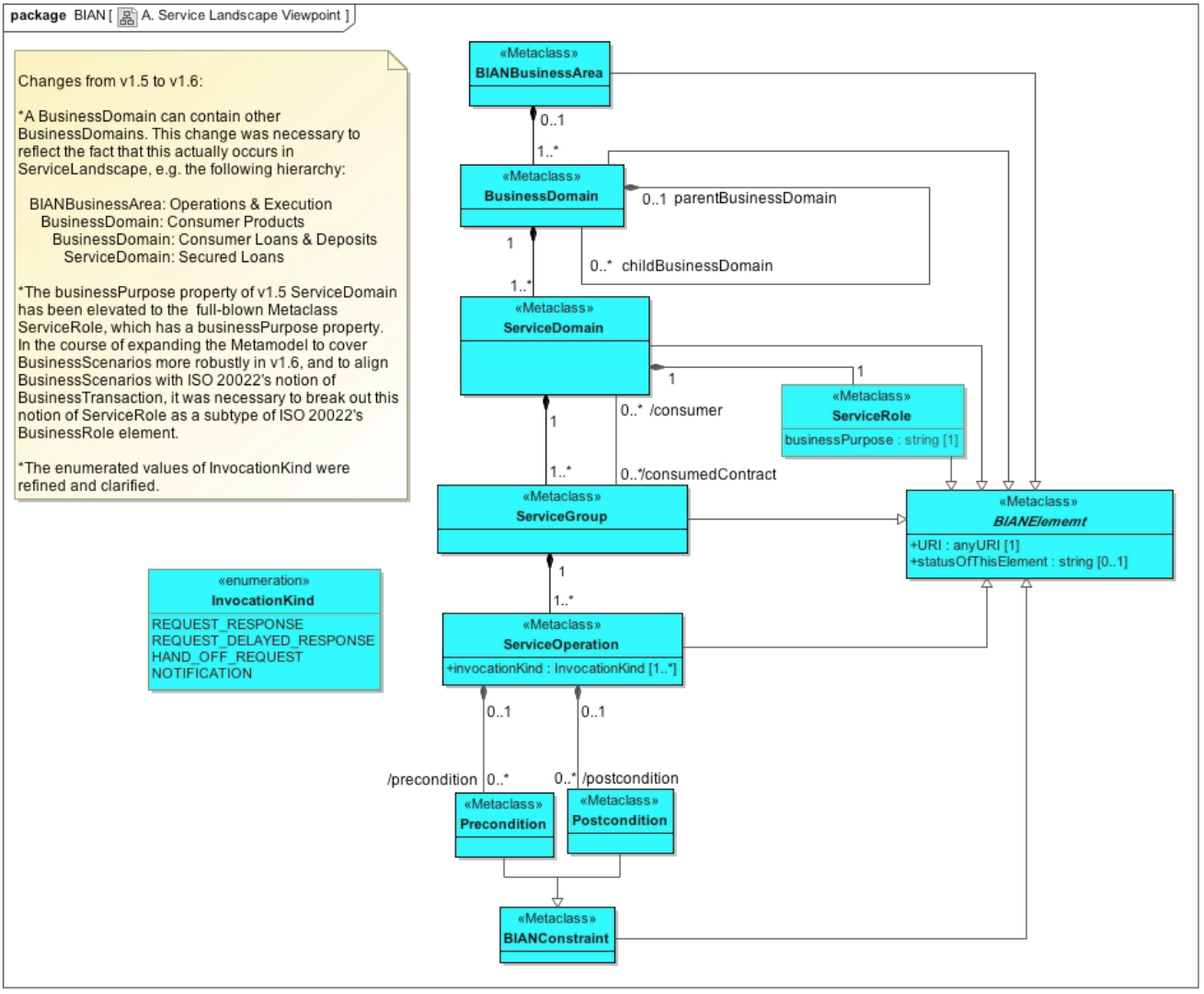
The BIAN Service Landscape is a very powerful instrument for many reasons:

- it acts as an “index” to the service catalogue, offering overview and facilities for discovery and look up
- it helps in organizing the management of Service Operations, assigning ownership
- it is the basic instrument for service portfolio management, i.e. managing the complete set of services as a whole, allowing reporting, monitoring, impact analysis, trend surveys, usage statistics, completeness and consistency checks, etc.
- it serves as a reference framework for migration roadmaps (by projecting existing and target application landscape on the BIAN Service Landscape) or for gap analysis (by projecting a packaged solution and the existing application landscape on the BIAN Service Landscape)

The diagram below highlights key elements of the service landscape: it is basically a hierarchical structure of different classes of services.

- BusinessArea: Formed by a broad set of capabilities and responsibilities and lies at the highest level of the BIAN Service Landscape hierarchy. Business Areas are used to decompose the functions of financial institutions according to their main business responsibility, operational behavior, or architectural features; e.g., “operations & execution”, “reference data”, “sales & service”. BusinessAreas are decomposed (i.e., subdivided) into BusinessDomains.
- BusinessDomain: An element of the functional decomposition of the banking business functions in the context of the BIAN Service Landscape. BusinessDomains are linked to certain skills and knowledge, which are clearly identifiable in the banking business (e.g., “payments” is a BusinessDomain of the BusinessArea “operations & execution”).

- ServiceDomain: Represents an “atomic” logical design. Atomic means that a BIAN ServiceDomain represents the smallest practical capacity or functional partition that can be service-enabled as a discrete and unique business capacity (e.g., “payments execution” is a ServiceDomain of the “payments” BusinessDomain). All BIAN ServiceDomains taken together make up a “peer set” with each performing its own specific business function or purpose. The collection of all BIAN ServiceDomains within a reference hierarchy of Business Areas and Business Domains is called the BIAN Service Landscape.
- ServiceGroup: A set of ServiceOperations, and is owned by a ServiceDomain. In essence, it is an interface to the ServiceDomain that is defined in terms of business semantics rather than in technical IT terms. For example, “manage payment order” is a ServiceGroup.
- ServiceOperation: Represents a service defined at the level of business semantics, specifying the access to one or more capabilities of a ServiceDomain (e.g., “Execute Payment Order” or “Update Payment Order” are ServiceOperations of the ServiceGroup “Manage Payment Order”). ServiceOperations are grouped into ServiceGroups, and a ServiceOperation has a provider and consumers. ServiceOperations have input messages and output messages.

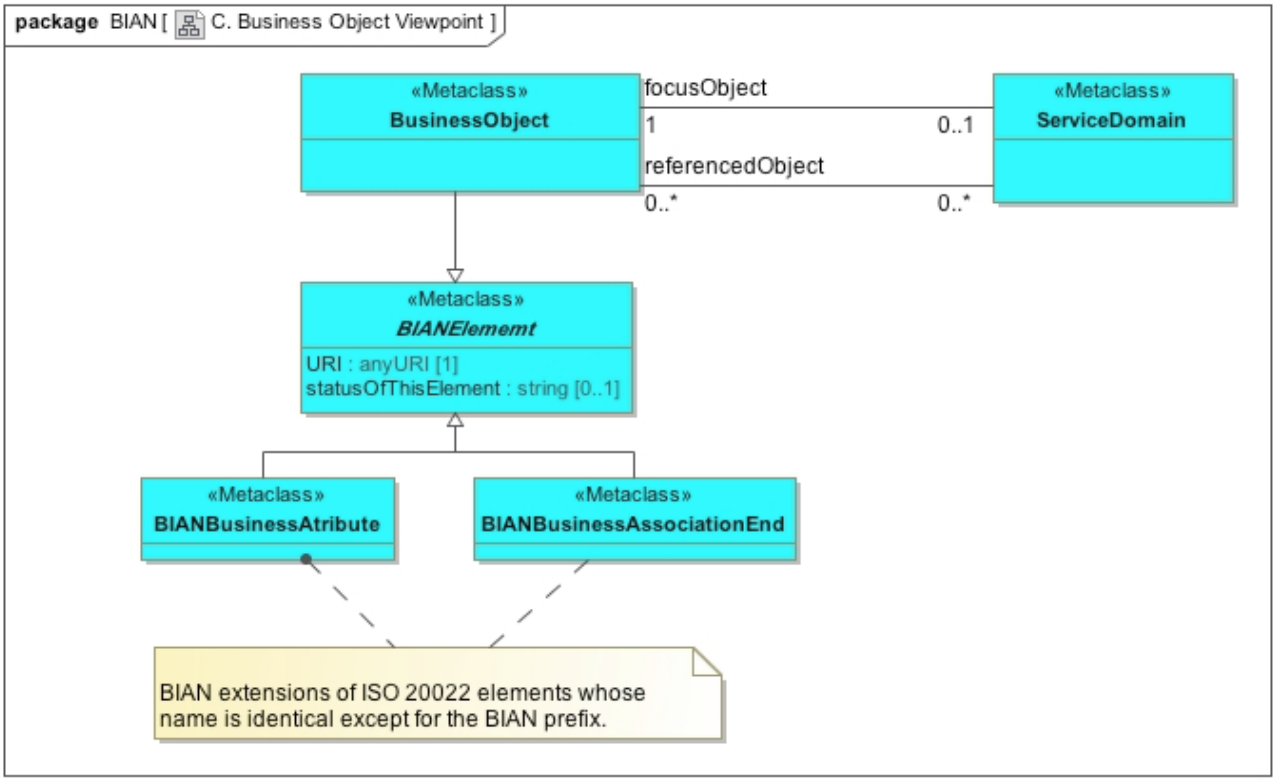


BIAN does not define specific BusinessAreas and BusinessDomains as canonical standards: It is not possible to force a particular hierarchical decomposition of business function on all banks. The BusinessAreas and BusinessDomains that BIAN publishes in its BIAN Service Landscape provide a reference model only. The BIAN ServiceDomains, on the other hand, are canonical, and are designed to fit into an arbitrary number of BusinessArea – BusinessDomain hierarchies.

9.2 Business Object Viewpoint

The diagram below shows the elements of the metamodel that pertain to BusinessObjects. BusinessObjects play a fundamental role in the definition of ServiceDomains, as each ServiceDomain has one focusObject whose instances it owns uniquely. Much of the internal structure of a BusinessObject is not visible on this diagram sincee this structure is defined by the ISO20022 Metamodel, of which the BIAN Metamodel is an extension.

BusinessObject: An individually distinguishable element characterized by a well-defined identity, structure, and behavior.BusinessObjects are fundamental to the definition of ServiceDomains, as each ServiceDomain has exactly one focus object, and possibly multiple other objects that the ServiceDomain references. A BusinessObject is a specialization of the ISO 20022 BusinessComponent.



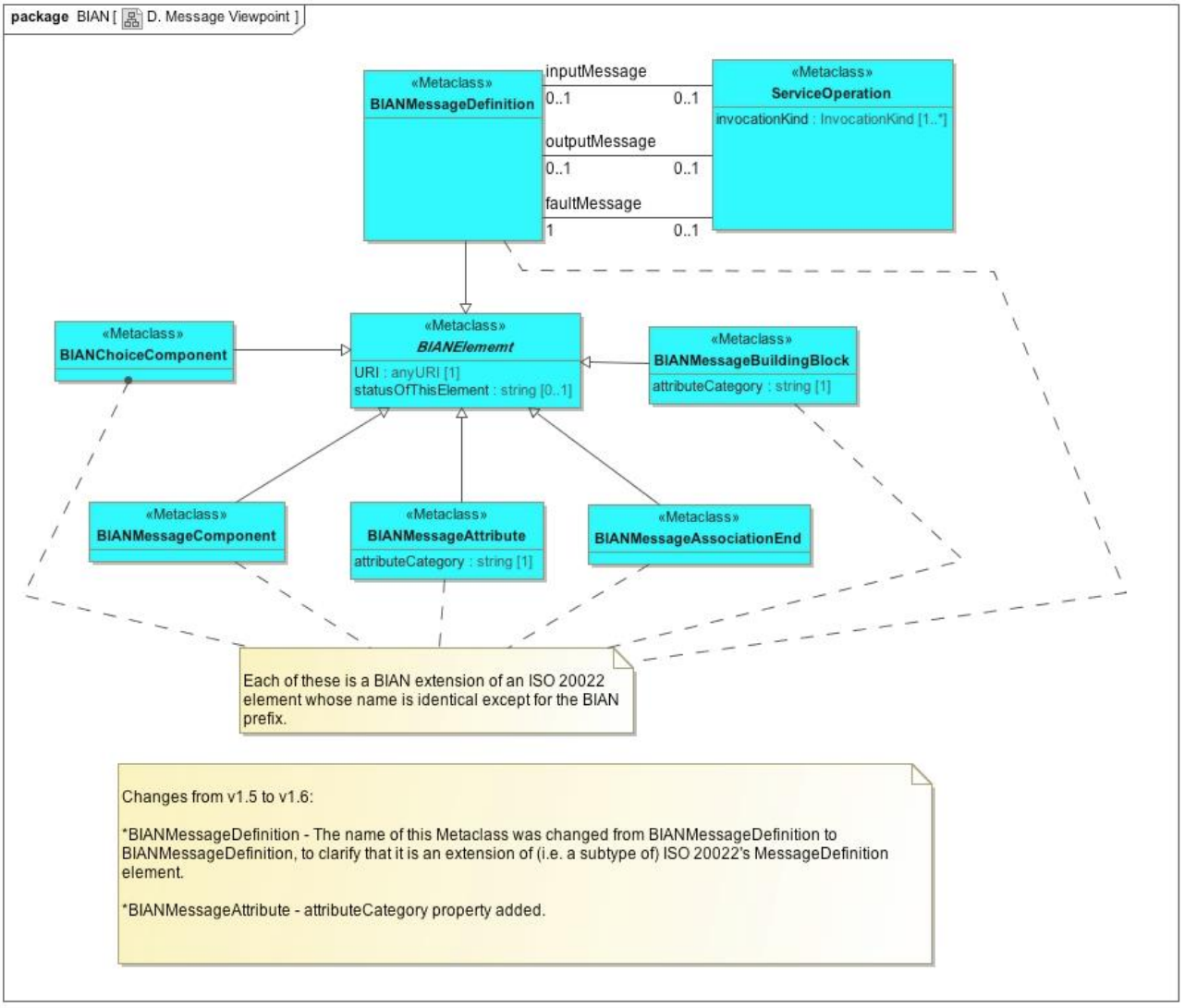
9.3 Message Viewpoint

This diagram below shows the elements of the metamodel that pertain to Messages. Messages play a fundamental role in the definition of ServiceOperations, as a ServiceOperation may have an input message, may have an output message, and must have a fault message.

Much of the internal structure of a Message is not visible on this diagram because that structure is defined by the ISO 20022 Metamodel, of which the BIAN Metamodel is an extension. The diagram below reveals the following:

- A BIAN Message is a specialization of an ISO 20022 MessageDefinition.It is a structured set of information exchanged in the context of a ServiceOperation.
- A BIANMessageComponent is a specialization of an ISO 20022 MessageComponent. MessageComponent is a set of MessageElements that can be used as a building block when assembling a Message.
- A BIANMessageAttribute is a specialization of an ISO 20022 MessageAttribute. MessageAttribute is an element of a MessageComponent, such as *StartDate*, which can optionally be traceable back to a BusinessComponent or to an element of a BusinessComponent. .
- BIANMessageBuildingBlock is a specialization of ISO 20022 MessageBuildingBlock. In ISO 20022, a MessageBuildingBlock defines how a MessageComponent or DataType is assembled into a Message.

The relationships between BusinessObjects and Messages are also not visible on this diagram, because those relationships are defined by the ISO 20022 metamodel where it defines the relationships between BusinessComponents and MessageComponents.



9.4 Scenario Viewpoint

The diagram below shows the elements that BIAN defines to model BusinessScenarios. The reason that there are only two metaclasses to support BusinessScenarios in all their richness is that the BIAN Metamodel heavily reuses the ISO 20022 Metamodel of BusinessTransaction and MessageTransmission.

BIAN does not publish BusinessScenarios as canonical standards. It models BusinessScenarios in order to discover, validate, and explain the canonical definitions of ServiceDomains and their elements. BIAN uses combinations of BusinessScenarios to clarify and explain the roles of, boundaries of, and exchanges among BIAN Service Domains.

Most relevant elements from this viewpoint are:

- A BIANMessageTransmission represents the sending of a communication between two Participants in a BusinessScenario. The word "BIAN" is part of the name of this element in order to distinguish this element from the MessageTransmission element in ISO 20022, which BIANMessageTransmission specializes. The six enumerated messageTransmissionKind values support four different modes of communication among the Participants in a BusinessScenario.
- A BusinessScenario is a model of how some ServiceDomains might collaborate together in response to a business event. The scenarios themselves are not canonical, because a bank that uses BIAN must have flexibility in how it combines the ServiceDomains to execute its business. A BusinessScenario defines an archetypical flow. The sequence as modeled can change in practice. Some interactions between ServiceDomains might be obsolete and others might be missing.