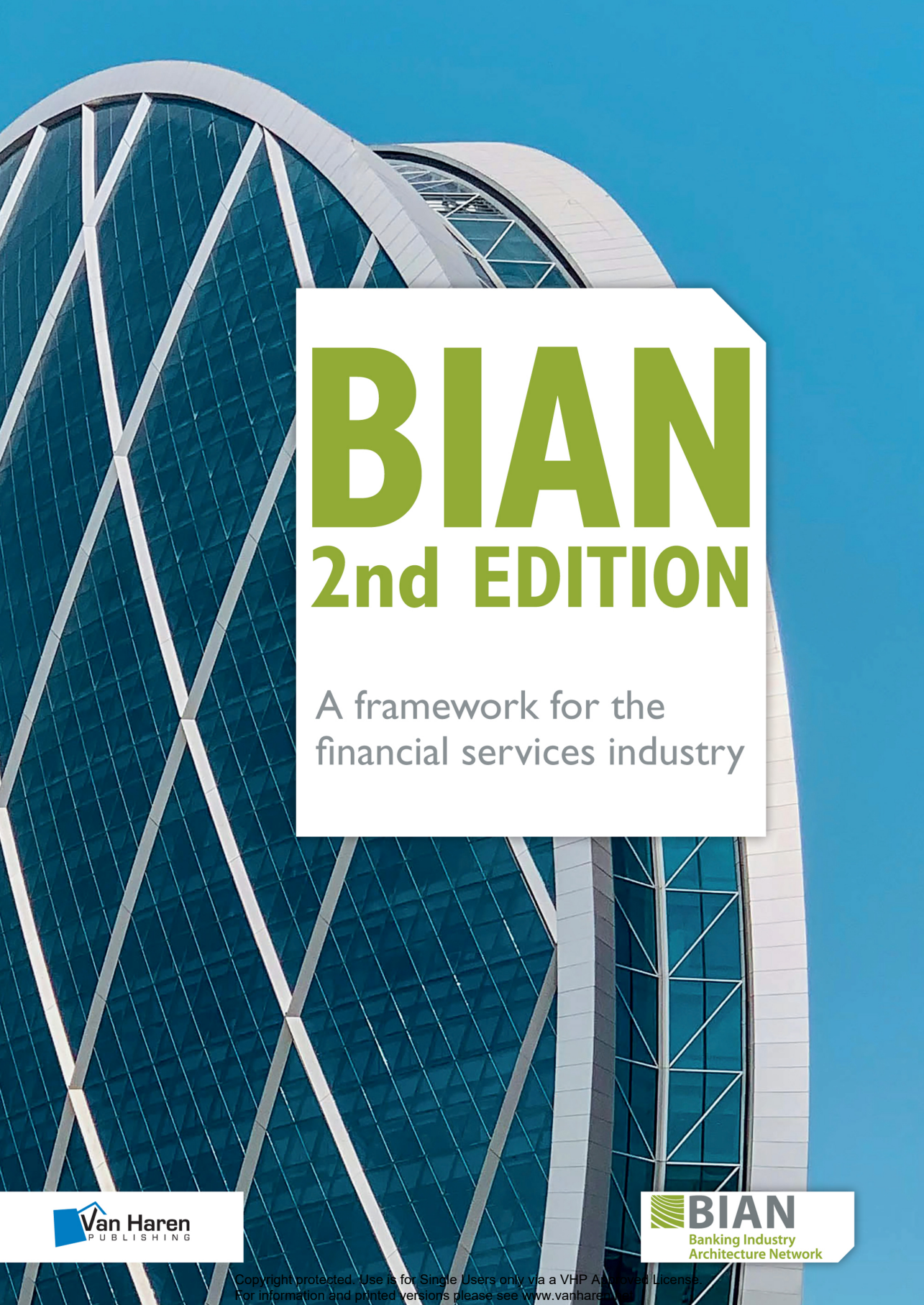

BIAN
2nd EDITION

A framework for the financial services industry

Van Haren PUBLISHING

BIAN
Banking Industry Architecture Network

BIAN 2nd edition - A framework for the financial services industry

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A framework for the financial services industry

Colophon

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Foreword by the chairman of the BIAN Board

Why this book?

It's been over 10 years now since some influential players in the financial services industry joined forces to stop the ever-growing cost for IT integration. The Banking Industry Architecture Network was born.

So, after 10 years of hard work by all members in our community, we bundled all of the knowledge and insights into the first BIAN 2019 edition of this book. As BIAN is continuously evolving and improving, so the BIAN book is also evolving and improving. Hence this second edition.

There has never been a more exciting time to be part of the financial services industry. Whether you're a traditional player, a FinTech enterprise or a tech enabler, emerging technology and game-changing regulation is driving unique opportunities in the sector. Most banks embrace these new challenges by collaborating with rapidly emerging FinTechs, exploring the boundaries of their technological environments. It also gives the banks a unique opportunity to migrate away from their existing, and sometimes very outdated core systems, and move into a fully digital new world supported by industry standards.

This book covers all aspects of architecture for the financial services industry. It should support all those involved to help their organizations to enter a truly digital world.

Besides our original service-oriented view, the authors have also included our latest insights on enterprise architecture and provided you with guidance in the fast-evolving API arena.

I hope you will find what you need to perform your architecture role at its peak.

Enjoy reading!

Steve Van Wyk
Global Chief Information Officer at HSBC

Introduction by the Executive Director of BIAN

The Banking Industry Architecture Network (BIAN)

The Financial Services Industry Architecture Network (BIAN) is a global not-for-profit association of banks, solution providers, consultancies, integrators and academic partners with the shared aim of defining a semantic standard for the financial services industry covering almost all of the well know architectural layers[1].

Who is this book intended for?

This book is intended for those enterprise, business and solution architects in the financial services industry (FSI) who are interested in applying the BIAN industry standards in their organization. The authors of the book expect the readers to have knowledge of business and/or ICT[2] architectural principles and methodologies.

For those architects and organizations familiar with the TOGAF framework, we have added a chapter describing how one can apply the BIAN standards with this development framework.

How to use this book?

This book will provide you with an in-depth knowledge to understand the full construct of BIAN artifacts, how to apply them and how you can contribute to help the standards fulfill your organization's needs. We will start with a short introduction of the BIAN organization, its goals, the deliverables and the future state.

Due to the constant development and evaluation of the BIAN models, additions to this publication will be publicly available at the BIAN homepage (www.bian.org).

1 See Appendix A2.1 "Architecture layers and aspects".
2 Information and communication technology.

The Banking Industry Architecture Network

The Banking Industry Architecture Network (BIAN) was formed in 2008 by a group of banks and solution providers with the shared aim of solving the integration issues by defining a semantic service operation standard for the financial services industry. At a later stage other standard bodies joined, as did some academic partners. BIAN's expectation is that a standard definition of business functions, service interactions and Business Objects that describe the general construct of any bank, will be a significant benefit to the industry. When compared to a proliferation of proprietary designs, such an industry standard provides the following main benefits:

- It enables the more efficient and effective development and integration of software solutions for banks;
- It will significantly lower the overall integration costs;
- It improves the operational efficiency within and between banks, and provides the opportunity for greater solution and capability re-use within and among banks;
- It supports the current need for more industry integration and collaboration by the usage of open and standardized APIs;
- It supports the adoption of more flexible business service sourcing models and enhances the evolution and adoption of shared third-party business services both on-premise and in the cloud;
- It supports FinTechs and RegTechs to gain an easy insight in the complex FSI structure.

The BIAN Financial Industry Reference Architecture's development is iterative, relying on the active contribution of industry participants to build consensus and encourage adoption. BIAN coordinates the evolution of the BIAN Financial Industry Reference Architecture on behalf of its membership with regular version releases to the industry, and seeks feedback to help continually expand and refine its content.

The Banking Industry Architecture Network Service Domain Landscape

BIAN Service Definition Working Groups govern Service Domains[3]. Each Service Definition Working Group has an associated area of business expertise. The scope covered by individual Working Groups is defined in their charter so that collectively, Working Groups cover the whole landscape with no overlaps between them. The governance for Service Domains within an area of business expertise is assigned to a Working Group. The Working Group is then responsible for the initial specification and any subsequent updates to its assigned collection of Service Domains. This implies the content creation is driven by the BIAN members using their experts' expertise.

3 The core building block for the definition of business functions, service interactions and Business Objects that describe the general construct of any bank.

The Banking Industry Architecture Network and Open APIs

In 2018 BIAN launched their Open API Sandbox environment with a continuously increasing number of API descriptions. This open-for-all environment (www.bian.org/deliverables/bian-portal) is true open source, encouraging the industry to enhance the content provided by BIAN so it becomes easier to adopt. The BIAN API definitions are 1:1 aligned with all underlying models and we are capable today of generating the Swagger definitions and the microservices code directly out of our repository to ensure a world-class consistency.

We try, as far as possible, to align with the ISO 20022 definitions in order to increase the overall usability.

Just recently we enhanced the portal with new features and content so it is a real source of information for all who undertaking an 'Open Banking' journey.

The Banking Industry Architecture Network and Open Data

Driven by the growing importance of data as the lifeblood of effective decision-making, BIAN started developing the BIAN Information Architecture or "BIAN BOM", (which stands for the BIAN Business Object Model).

The objective is to develop a standard Open Financial Services Conceptual Data Model. Where possible, BIAN aligns with existing standards such as ISO 20022 and FIBO.

BIAN applies a specific methodology to create Service Domain Business Object Model diagrams. All the identified Business Objects and the relationships between each other are consistent within and between the Service Domain Landscape.

Hans Tesselaar
Executive Director
Banking Industry Architecture Network

About this second edition

The content of this second edition is a fully revised version of the first edition of BIAN, that was published in 2019 (BIAN Edition 2019).

The theory and principles of the BIAN Framework and its application in practice, are now treated in two separate parts of the book.

The most recent additions to the BIAN standards are the Semantic API descriptions and the Business Object Model (BOM). These are treated in more detail. The application of the BIAN Framework in different contexts is treated more extensively and has been illustrated with lots of (semi-)real-life examples.

Following topics have been added: the newly developed "BIAN adoption journey" and the Business Capability Model.

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PART I

INTRODUCING BIAN AND ITS REFERENCE ARCHITECTURE FOR THE FINANCIAL INDUSTRY

What to expect

This part of the book aims to create an understanding of the BIAN Framework.
This entails two objectives:
Firstly, the reader should understand the philosophy upon which BIAN's Reference Architecture for the Financial Industry is based and the "constructs" (techniques and organization) used to create its elemental, mutually exclusive, collectively exhaustive building blocks.
Secondly, the reader will obtain an overview of what BIAN has to offer to facilitate the adoption of this Architecture. BIAN's framework is a "toolbox" that supports financial institutions in their journey towards an agile architecture. BIAN's Reference Architecture for the Financial Industry is the core of this framework.

Readers in a management position as well as business and application architects, need to understand the unique characteristics of the BIAN Reference Architecture and the toolbox supporting its adoption, that distinguish BIAN from other standards.

Business and application architects need a solid understanding of the principles that the Architecture is based on and of the type of "building blocks" that make up this Architecture.

1 Introducing BIAN, the organization and its Reference Architecture for the Financial Industry

This chapter introduces the BIAN organization and its Reference Architecture for the Financial Industry and how BIAN supports financial institutions in the adoption and application of its framework.

BIAN provides the financial industry with a "Reference Architecture" as a means to realize its mission and vision (Section 1.1).

To survive in these challenging times, where technology and regulations drive a drastic change in the financial ecosystem, banks need agile systems that can provide the required business agility. BIAN's Reference Architecture is based on agile principles and supports a financial institution in the elaboration of, and migration to, an architecture that provides that necessary agility (Section 1.2).

The characteristics of the BIAN Reference Architecture provide it with a unique position compared to other standards (Section 1.3). BIAN aligns with all relevant standards. It has the ambition to provide a "common language" between different banking standards and regulations.

The BIAN organization (Section 1.4) provides a framework consisting of its Reference Architecture as well as publications, training and a certification program that support individuals and organizations to adopt its Reference Architecture. This framework evolves and keeps in touch with the reality of the financial industry through co-creation by its members, coordinated by BIAN.

1.1 THE BANKING INDUSTRY ARCHITECTURE NETWORK, MISSION AND VISION

The BIAN organization was created to support financial institutions in their journey to an agile banking architecture on both an enterprise and solution level.

BIAN, the "Banking Industry Architecture Network", offers a Banking Reference Architecture Framework that is an enabler to become an adaptive financial institution, conformant to the principles of an agile enterprise architecture.

1.1.1 The Banking Industry Architecture Network

The Banking Industry Architecture Network (BIAN) is a global, not-for profit association of banks, solution providers, consultancy companies, integrators and academic partners with the shared aim of defining a semantic standard for the banking industry covering almost all the well-known architectural layers.

The Banking Industry Architecture Network was formed in 2008 by a group of banks and solution providers with the shared aim of defining a semantic Service Operation standard for the financial services industry. At a later stage other standards bodies, like ISO and FDX joined, along with some academic partners.

The BIAN Association strives to enhance the flexibility and agility of financial services systems by improving the integration of these with an architecture that is based on services.

1.1.2 BIAN: vision, mission and Service Landscape

BIAN's **vision** and expectation is that a standard definition of business functions, service interactions and business objects that describe the general construct of any bank will be of significant benefit to the industry.

The central objectives for ICT in the banking industry are to provide flexibility, to lower the ICT and operational costs of the bank and to help banks mitigate the risks and seize the opportunities associated with technology innovation.

BIAN's **mission** is to provide the world with the best banking architecture framework and banking standard. BIAN provides a trusted roadmap for constant innovation.

The goal of the BIAN Association is to develop the most important content, concepts and methods in interoperability, supporting the aim of lower integration costs in the financial services industry and facilitating business innovation and agility by:

- Providing an architecture framework with all of the necessary elements, tools and methodologies for a sustainable operational model through the adoption of, and alignment with, available market standards;
- Focusing on the definition of semantic services and/or API-definitions to improve the semantic integration of the financial services landscapes;
- Enabling the financial services industry to develop and run a loosely coupled environment successfully;
- Gaining acceptance from the members of the BIAN Association and the industry of the way the requirements will be implemented by both financial institutions and

solution suppliers, resulting in the defined services becoming the de-facto-standard in the financial services industry.

1.1.3 BIAN's Reference Architecture for the Financial Industry

BIAN's Reference Architecture is a collection of architecture artifacts that makes up its industry standard. The main fundamental building block within the BIAN Reference Architecture is the "**Service Domain**".

The BIAN Service Domains define financial services-specific semantic services. The Service Domains are the cornerstone upon which to achieve agile flexibility.

BIAN's **Service Landscape** is the term used to refer to the collection of Service Domains that are defining the functional capacity building blocks within the banking industry.

The value of BIAN is the standardization of those functional services based on a well drafted architecture with elements carefully chosen from industry best practices.

It is the ambition of the BIAN Association to achieve a consensus on the service definition among leading banks and providers in the financial services industry, which in due time should lead to standardized services.

When compared to an increasing number of proprietary designs, a dedicated industry standard, like BIAN, provides the following main benefits:

- Created by industry experts from around the globe;
- Regular updates following the market developments and industry needs;
- It enables a more efficient and effective development and integration of software solutions within the bank and between banks;
- It significantly lowers the overall integration costs;
- It improves the operational efficiency within and between banks and provides the opportunity for greater solution and capability re-use within and among banks;
- It supports the current need for more industry integration and collaboration through the usage of (open) APIs;
- It supports the adoption of more flexible business service sourcing models and enhances the evolution and adoption of shared third-party business services;
- It supports FinTechs and RegTechs to gain an easy insight in the complex financial services industry structure.

Banks can use BIAN to define their bank-specific agile architecture, supporting the interoperability of information and information services between participants of the financial industry eco-system. BIAN can also be used to optimize the interoperability of information and information services within the organization.

1.2 PRINCIPLES OF THE REFERENCE ARCHITECTURE FOR THE FINANCIAL SERVICE INDUSTRY

The financial industry, with banks, real credit institutions, pension and property management companies, is one of the most digitalized industries in the world. Digitalization is evolving and changing fast and so is the financial ecosystem. Financial institutions are in need of support for agile digital transformation in an open finance ecosystem. It is BIAN's vision and mission to provide such support.

1.2.1 Challenges for the financial industry

Financial industry in movement
The industry as a whole is facing one of the most challenging evolutions in history. Change is happening faster than ever. Disruptive technology is changing the lives of consumers in small but extraordinary ways. Today, virtual assistants schedule appointments, while smartwatches monitor our sleep patterns and voice command technology turns off our house lights.

Banking needs to fully participate in this evolution. Advancements in technology have increased demand for accessible and convenient solutions that meet a consumer's banking needs. On top of that, the industry is aware of a new disruption that is brewing – one that will once again transform the industry over the coming years.

It is not only technology that is changing the scene. New regulations are changing the playing field dramatically. They force financial institutions to disclose financial information to Third Party Providers (TPPs), providing access to financial services to new players and facilitating the competition of FinTechs and RegTechs in the financial playing field. Regulations impose security requirements to protect person-related data. After the worldwide financial crisis in 2008, regulators are requesting comprehensive financial and risk reporting, including data lineage requirements.

Besides the drivers mentioned above the unforeseen disruption caused by COVID-19 extremely impacted the behavior of all parties involved in our industry. We are moving from "Cash" to "Cashless" and from "Face2Face" to "Virtual". This all sets additional demands on technology and therefore on Architecture.

Boosted by COVID-19, regulations, RegTechs and FinTechs, the interoperability of financial data and services via "Open Linked Data" and "Open Banking APIs" is rapidly becoming an indispensable requirement for creating innovative financial services. It facilitates all types of customer journeys, from buying bread to buying a house, from commuting to and from work to planning to travel for leisure or business. In every journey where financial and trusted services are needed and trust is required, banks are seeking to be the preferred partner.

To remain the preferred partner in this changing financial ecosystem, financial institutions need to be information-driven, having the right data, of the right quality, at the right time at the right place, in the possession of the right party. Information that comes from a trusted source of truth. Next Best Offer, context specific offers, risk profiles. . . based on data that is unique to the financial sector, help financial institutions make informed decisions and remain the trusted partner that helps customers make informed decisions.

Financial information requirements and financial services are changing at a very high speed. The financial ecosystem is continuously changing, at an ever-increasing pace. This requires an adaptive and agile banking business. Adaptability to new regulations, service requirements, new market players and stakeholders drives the speed and dynamics of the financial world.

The financial industry services and data must become more transparent, secure and open. The financial services need to be tailored and deeply integrated into consumer's lives, seamlessly, with information created on the spot by Artificial Intelligence Systems and offered at the right time at the right place to the right person.

Financial institutions partner with other ecosystem players, offering services that will extend beyond banking. The financial industry will provide services in a hyper networked service-oriented "Open API economy", where multiple ecosystem players participate in collaboratively fulfilling the financial needs of the customer.

In this changing ecosystem, financial institutions want to remain "trusted custodians of financial services and customer assets[4]".

Legacy complexity

Financial institutions were among the first to automate their businesses and are now among the most digitalized service providers. They have pervasive but often complex legacy ICT platforms, with lots of duplication of functionality and data. Monolithic systems, stovepipe systems, are connected through point-to-point connections with numerous interface adapters. These legacy systems are a barrier to reacting in a timely and cost-effective manner to market and ecosystem changes. Their complexity results in inflexible/unresponsive systems, inflated enhancement, increasing maintenance and operational costs, and an inability to rapidly leverage advanced solutions, technologies, approaches and business models.

To survive in an industry with high investments in digitalization and low margins, financial institutions are searching to lower the integration and interoperability costs, while being able to respond very quickly to change.

4 Which could expand to include digital identities.