



# HOW TO BRIDGE THE GAP BETWEEN BUSINESS, IT AND NETWORKS

## **APPLYING ENTERPRISE ARCHITECTURE PRINCIPLES TO ICT TRANSFORMATION**

A digital telco approach can provide operators with the agility required to thrive in the Networked Society.

This approach requires a transformation of both the front end and back end of an operator's business.

Applying Enterprise Architecture principles results in six key steps operators should take to bridge the gap between business, IT and networks and thereby secure an effective transformation.

# INTRODUCTION

Telecom markets are increasingly driven by consumer demands for a better user experience, value-added digital services and competitive pricing. In this fast-changing landscape, business agility and flexibility are essential.

For operators, a digital telco approach represents a new business and operating model for creating digital services and responding to consumer demands. This model provides the agility required to manage the entire digital ecosystem. However, the model also calls for an ICT transformation of both the front end and back end of an operator's business.

Successful transformation requires an agile and structured methodology. Here, operators can benefit from implementing industry-standard Enterprise Architecture (EA) principles.

EA is a practice that bridges the gap between business, IT and networks. It allows an organization to take a holistic view of its components, and can be used to identify and analyze the key dimensions of a solution that are needed to deliver a desired business outcome. As a result, EA is relevant to the development of the whole enterprise – from business strategy, models and processes, to information systems and technical infrastructure.

This paper describes best practices for operators in leveraging EA principles to bridge the gap between business, IT and networks and to drive the realization of business benefits.

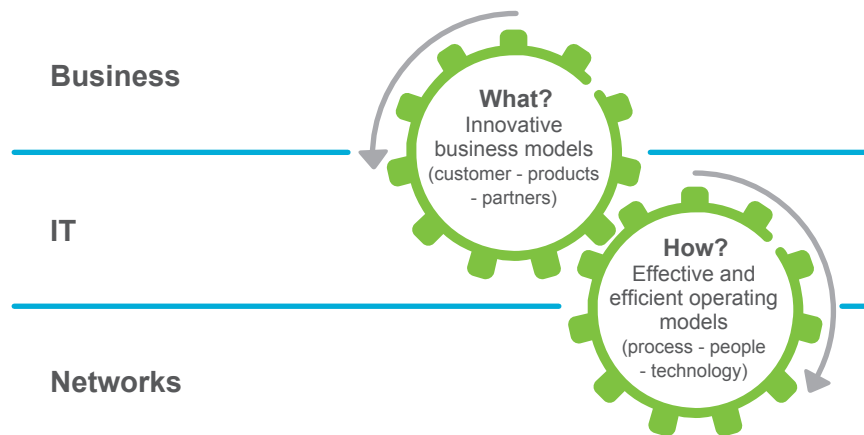


Figure 1: EA is relevant to the development of the whole enterprise – from business strategy, models and processes, to information systems and technical infrastructure.

# WHY BRIDGE THE GAP?

Driven by increased demand in relation to digital services, user experience and operational excellence, operators are facing new business challenges where success will heavily be dependent on their capability to bridge the gap between business, IT and networks.

Securing this bridging capability is essential to succeed in the necessary ICT transformation – of both the front end of the operator's business, which faces both customers and partners, and the back end, which enables business capabilities.

- > Transforming the front end of the business results in:
  - > enablement of innovative digital services with shorter time-to-market and with higher quality, flexibility, automation, simplicity and experience for users and partners
  - > digitalization of user and partner channels.
- > Transforming the back end of the business results in:
  - > Operational efficiencies through process automation and simplification
  - > reduced complexity through a catalog-centric and component-based service-oriented architecture that uses real-time interactions between IT and networks
  - > reduced capex and improved business agility and flexibility through Network Functions Virtualization (NFV), network programmability and cloud infrastructure.

# THE BENEFITS OF ESTABLISHING AN EA PRACTICE

By establishing an EA practice as a central planning capability, and as an ongoing program with a solid foundation and tool to support it, an operator will be able to:

- > enhance decision-making by gaining a holistic view of its business and a detailed understanding of its EA artefacts and their relationships
- > effectively manage change by enabling impact analysis of affected artefacts and eliminating discovery time and effort
- > plan evolution from as-is to desired architectures by providing guiding principles for planning and selection of transition states
- > better align IT to business by demonstrating alignment between IT initiatives and business objectives, and expressing architecture work in terms of business outcomes and capabilities
- > shorten time to market by promoting re-use of patterns and packaged building blocks.

As shown in Figure 2, EA is composed of a governance framework, a work method, a meta-model and a tool:

- > The EA governance framework is the practice by which EA is managed and controlled at an enterprise-wide level, ensuring that processes are in place to ensure the best possible compliance with the target architecture. Governance is achieved by setting up the right EA team structure to operate its EA work method, and by formalizing the team's interactions with the EA stakeholders.
- > The EA work method is the process followed to plan and develop architecture, identify solutions and govern their implementation. It is also the process whereby all the relevant architecture artefacts are gathered and linked to describe the state of an organization from both a business and a technology perspective.
- > The EA meta-model defines how and with what the architecture artefacts are described in a structured way. It formalizes the relationships between the artefacts to ensure impact analysis and to provide traceability between the different parts of the architecture.
- > The EA tool provides a wide range of modeling capabilities, reporting and publishing functionalities, and effective, easy-to-use interfaces to define, store and link architectural artefacts. The output of the EA work method is normally stored in the EA tool, the database structure of which is customized according to the EA meta-model.
- > The EA reference models are frameworks, best practices and reference architectures developed by external parties that can be applied to develop target architectures. Examples include TMForum Framework, ITIL and TOGAF Foundation Architecture.

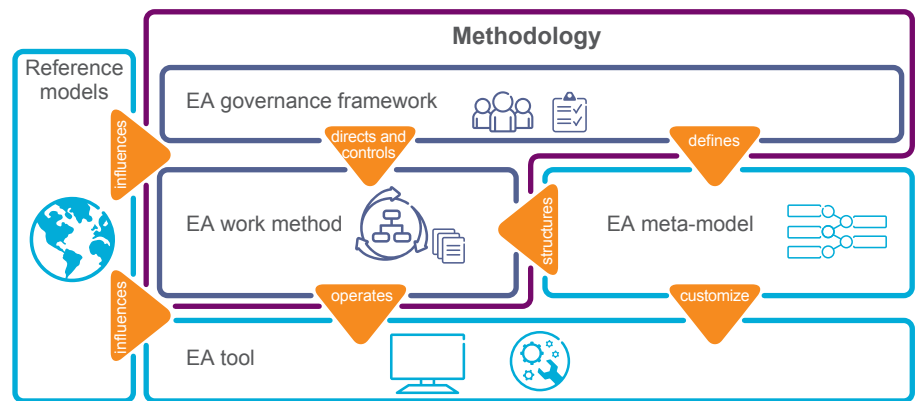


Figure 2: EA – foundation components.

# BRIDGING THE GAP

Translating business requirements to achievable operational and technical capabilities will require an end-to-end approach and agile ways of working in cross-functional teams. This will ensure that business benefits are realized with the speed needed to keep up with market dynamics and consumer expectations.

In practice, an operator should follow six steps in order to bridge the gap between business, IT and networks. Each step is a practical result of applying EA principles to the development of the whole enterprise. The steps are:

- > innovate business models
- > redefine operating models
- > define an EA strategy and IT planning
- > realize business benefits
- > use EA reference models and tools
- > realize end-to-end solutions.

## INNOVATE BUSINESS MODELS

Business model innovation will be increasingly critical for an operator when realizing its value proposition. Defining strategic goals and the required business models will set the priorities for the scope of both the front-end and back-end transformations needed. Alexander Osterwalder's Business Model Canvas, as shown in Figure 3, can help illustrate this process.

For example, consider the value proposition: "As a market-leading digital telco, we will offer the market's most attractive portfolio of digital services to retail and enterprise users, with a competitive price and the market's best-perceived user experience." Realizing this proposition will require the operator to implement the following business capabilities:

- > front-end transformation (addresses revenue and value streams, as shown in Figure 3):
  - > digitalization and omni-channel access (distribution channels)
  - > big data analytics and business intelligence to gain user insights from consumers as well as retail and enterprise users (customer segments)
  - > self-service and social media networking (customer relationship).
- > back-end transformation (addresses cost structure, as shown in Figure 3):
  - > network programmability, NFV and cloud infrastructure (core capabilities)
  - > real-time automation and simplification (activities)
  - > shared networks (partner networks).

## REDEFINE OPERATING MODELS

Front-end and back-end transformation can lead an operator to rethink its entire operating model.

All dimensions of the operating model – KPIs, technology, processes, people, organization, partners and alliances – will be impacted. Each dimension will need to be redefined to handle digital services, manage consumer experiences and secure the agility to manage the entire digital ecosystem.

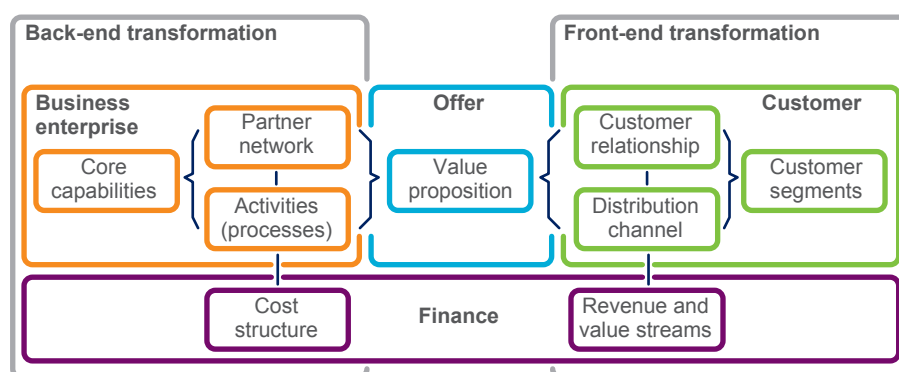


Figure 3: Osterwalder Business Model Canvas.

For example:

- > **KPIs:** introduce goals and metrics that combine top-line growth, Net Promoter Score and margin.
- > **Technology:** create an information (catalog)-centric and service-oriented architecture of applications to increase agility and decrease cost of integrations. Enable flexible infrastructure ready for the digital services landscape, using cloud, NFV and software-defined networking technologies.
- > **Process:** automate and simplify end-to-end process flows and increase the level of self-service in the front end, and the level of automation and self-organized networking in the back end.
- > **People management:** establish a user-experience-centric culture.
- > **Organization:** establish organizational structures to support agile ways of working in cross-functional teams.
- > **Partners and alliances:** enable a more collaborative approach with a new ecosystem of partners/enterprises and over-the-top players.

### DEFINE AN EA STRATEGY AND IT PLANNING

To define an EA strategy and IT planning – including the target architecture needed – and to realize the redefined operating model of an operator, a holistic assessment approach needs to be applied. This is shown in Figure 5.

The approach aligns an organization’s strategy, business, information systems and technology, and aims to define the future vision, target state and planning steps by performing the following activities:

1. **Scope:** Define the focus and scope of the EA assessment.
2. **Discover:** Assess and evaluate the current state of the organization and its EA, including strategy capabilities, business processes and information systems, as well as current and planned projects.
3. **Diagnose:** Identify pain points and gaps, define process heat maps, complete an information systems health assessment, present first findings and recommend quick wins.
4. **Target:** Create a target state EA to support the required business capabilities in the form of business process recommendations and an information systems architecture end game.
5. **Roadmap:** Develop a strategic transition plan and roadmap to achieve the future state through a set of transformation activities and defined transition architectures.
6. **Propose:** Create a holistic transformation proposal(s).

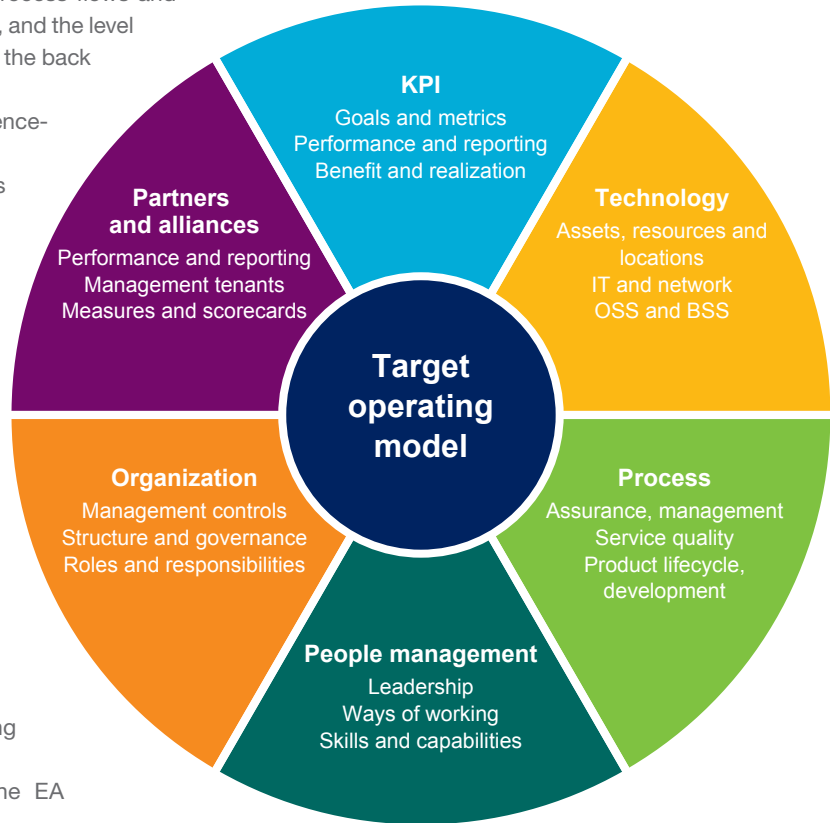


Figure 4: Dimensions of a target operating model.

### REALIZE BUSINESS BENEFITS

Realizing business benefits is a fundamental objective when practicing EA principles. This process is driven by the business capabilities that have been identified as requirements – for example, by an operator that has decided to apply a digital telco approach.

A business capability is composed of the skills, processes, routines, organizational structures and disciplines that enable firms to build, employ, and orchestrate assets relevant to satisfying user needs.



Figure 5: EA assessment methodology.

A business benefit is defined as the result of an action or decision that contributes to meeting one or more business objectives. It is a measurable outcome from an action, investment, project, resource or technology, and represents a central element in strategic planning and building business cases.

Business benefits can be categorized into four types: revenue, operational, customer experience management and business efficiency benefits.

Realizing business benefits is a continuous improvement process that requires constant interactions with business stakeholders. This is ensured by applying EA principles and should follow these phases:

> **i) Capture business capability requirements**

Based on its strategic ambitions, the operator should capture and prioritize critical business capability requirements. These could be the business capability requirements of efficiently and effectively provisioning virtual network functions and services, to give just one example.

> **ii) Analyze end-to-end business process impacts**

The operator should analyze the business processes that will be impacted by the new business capability from an end-to-end perspective, by identifying pain points and defining KPIs to measure business process performance. The aim is to simplify and automate processes, and to reduce the number of organizational handovers. For example, in a plan-to-provision scenario, there is a need to analyze the impact on the end-to-end process created by managing virtual network functions. There is also a requirement to define KPIs, identify pain points and perform heat mapping to identify potential candidates for simplification and automation.

> **iii) Drill down business processes and design use cases**

The operator needs to drill down end-to-end processes to further isolate critical steps. It should illustrate and analyze use cases in activity and sequence diagrams to identify the expectations on each logical Application Building Block's (ABB) capabilities and integrations. In the plan to provision example, the process should be drilled down to individual configurations and deployment use cases to analyze the detailed requirements for configurations of, and integrations between, logical application building blocks to support the use cases.

> **iv) Define ICT and network capabilities required and map to commercial off-the-shelf (COTS) products**

The operator should analyze and define the ICT and network ABB capabilities required to realize the prioritized business capabilities through the use cases. It should audit the available capabilities of the legacy applications used and clearly define the application capability gap per ABB. There is also a need to identify the key information entities and information sources for the target architecture design, and to define a high-level logical information model including a CRUD (create, read, use, delete) matrix that shows ownership and dependencies.

The most cost-efficient target architecture design of the ABB landscape should be created following architectural principles such as a catalog-centric approach and service-orientated architecture. In the plan to provision example, the functional capabilities of the legacy applications

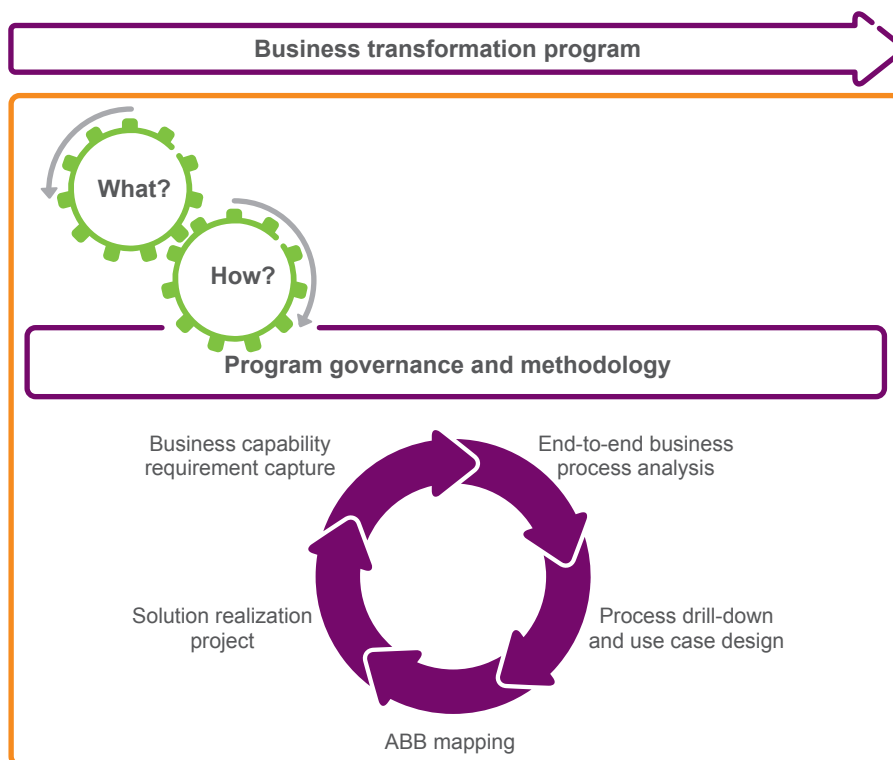


Figure 6: Realization of business benefits.

in the network planning, optimization and configuration domains should be benchmarked against the requirements of the new ABB capabilities for managing virtual network functions. The key information entities and information sources should be identified and analyzed for the target architecture design. Based on the gap identified, a target architecture that includes all required capabilities can be defined.

> **v) Realize solution projects**

Operators need to define a roadmap for solution realization, including recommended COTS software and migration strategies. In the example, the new ABB requirements should be mapped to a capability evolution of the legacy applications deployed. Alternatively, a roadmap for a side-by-side replacement with a fit-for-purpose COTS solution suite should be proposed that fulfills the requirements of managing the resource lifecycle of virtual and non-virtual network functions.

## USE EA REFERENCE MODELS AND TOOLS

An operator's operating model is described in hundreds of different EA artefacts – as end-to-end processes, use cases, and application and information entities, all with dependencies and inter-relations. Documenting these in ordinary word processing and drawing tools will not be sufficient to manage change effectively, improve time to market or achieve operational efficiency. EA artefacts documented in this way will often end up on a shelf and will not be used for operations or for driving change.

Driving change in order to increase speed and flexibility in an efficient and effective manner requires the active use of an EA tool to:

> **i) Reduce time to market and streamline documentation**

By clearly documenting and continuously housekeeping EA artefacts and their relations to other artefacts in a structured and consistent way, operators can reduce time to market when realizing new business benefits through a quicker and more efficient impact analysis of new business requirements.

> **ii) Facilitate communication**

By using consistent notation, layering and terminology of EA artefacts, operators can improve communication with stakeholders and business partners.

> **iii) Enable continuous improvement**

Operators can enable continuous improvement by establishing a unique repository to understand and manage impacts on COTS realizations during change, and avoid unwanted effects and business-impacting mistakes when performing change.

By using an EA tool, new business requirements will be managed with shorter time to market and the quality of changes will be improved, which contributes to operational efficiency.

## REALIZE END-TO-END SOLUTIONS

End-to-end solutions should be realized by building a transformation roadmap and following two practical considerations:

### Best-of-suite solution

The traditional best-of-breed solution approach – in which operators cherry-pick different vendor software products and stitch them together with large integration efforts between multiple systems, data sources, information models and customized architectures and solutions – is no longer recommended. It takes too much time, effort and expense for an operator to develop, manage and evolve custom-built solutions and OSS/BSS architectures.

Operators require OSS/BSS solutions that are industrialized, supported and shared with other actors in the marketplace to the largest extent possible. Instead of a best-of-breed solution, operators need a best-of-suite approach that meets evolved OSS/BSS demands, improves time to market, reduces TCO and simplifies solution evolution.

By using horizontal software platforms and supported solutions, the operator can also reduce overall transformation complexity. When going for a best-of-suite approach, a strategy should be in place to avoid vendor lock-in and a one-size-fits-all approach.

An Application Building Block (ABB) is a well-defined set of application functions developed to support business processes and associated data. An ABB represents a coarse-grained functional component of an application that should in most instances be able to run on its own, meaning that an ABB is a self-contained piece of software that may be purchased in the open market individually or as part of a much larger suite of applications. In addition, a COTS product can correspond to a single ABB or to a set of ABBs.



### Side-by-side versus step-by-step

In some cases, a step-by-step evolution can be the right approach to complement the existing capabilities of an operator's legacy OSS/BSS landscape with additional application capabilities for a specific and clearly defined purpose.

However, transformation of the back-end and front-end architectures to fully support the application capabilities required by a redefined operating model requires a more pervasive change, preferably realized using a side-by-side migration strategy.

Using standard components and a modern EA that incorporates clear views about data separation, it is now possible to start building a catalog-driven architecture based on common master data repositories. This deals with key data entities such as users, products and resources.

When going for a side-by-side approach, a sound data migration strategy should be in place, in which introducing and maintaining master data repositories plays an important role.

# CONCLUSION

A digital telco approach can provide operators with the agility required to thrive in the Networked Society. However, the model requires an ICT transformation of both the front end and back end of an operator's business.

EA is concerned with planning the development of the whole enterprise, including its business processes, information systems and technical infrastructure, and can therefore be a vehicle to bridge the gap between business, IT and networks.

Operators should therefore apply EA principles to steer decision-making towards the evolution of the future state architecture. They should establish an EA practice as a central planning capability, and as an ongoing program with a solid foundation and tool to support it.

The following aspects serve as the foundation for ICT transformation and act as a recommendation to all operators:

- > Innovate business models, based on the enterprise business strategy, to respond to consumer demands in digital services. This will set the right scope of priorities for the front-end and back-end transformations needed.
- > Redefine the operating model to handle digital services, manage consumer experiences, and secure both operational excellence and the agility to manage the full digital ecosystem.
- > Define an EA strategy and IT planning by applying a holistic assessment model based on principles of scoping, discovery, diagnosis, targeting, roadmap and proposing.
- > Realize business benefits as a continuous improvement process that builds on constant interactions with business stakeholders.
- > Use EA reference models and tools to manage new business requirements with shorter time to market and to improve the quality of changes.
- > Realize end-to-end solutions by building a transformation roadmap and applying a side-by-side migration strategy using best-of-suite solutions.

# GLOSSARY

ABB	Application Building Block
COTS	commercial off-the-shelf
CRUD	create, read, use, delete
EA	Enterprise Architecture
NFV	Network Functions Virtualization

# FURTHER READING

- > Ericsson, White Paper: The real-time cloud – combining cloud, NFV and service provider SDN, February 2014, available at: [http://www.ericsson.com/news/140220-the-real-time-cloud\\_244099438\\_c?](http://www.ericsson.com/news/140220-the-real-time-cloud_244099438_c?)
- > Ericsson, White Paper: Next-generation data center infrastructure – making hyperscale available, February 2015, available at: [http://www.ericsson.com/news/150227-next-generation-data-center-infrastructure\\_244069647\\_c?](http://www.ericsson.com/news/150227-next-generation-data-center-infrastructure_244069647_c?)