Business Capability for BizDevOps

The primary purpose of this material is to introduce an artifact designed to guide organizations in comprehensively understanding the essential elements (people, processes, information, and resources) required for the transition from a DevOps to a BizDevOps approach. In this manner, organizations will be able to develop the capability to produce software using BizDevOps, incorporating business roles, thereby enabling actions to achieve IT/Business alignment without losing the inherent agility of DevOps.

What is BizDevOps?

BizDevOps is an approach to software (SW) development that considers three continuous and integrated cycles (business, development, and operations) (see Figure 1) , to implement SW requirements that support the needs of the organization (Gruhn & Schäfer, 2015).

Figure 1. BizDevOps Cycles.

BizDevOps is a natural progression that organizations using DevOps as a software development approach can make. This progression includes activities to facilitate IT/Business alignment and the involvement of business stakeholders.

What is its purpose?

This approach aims to bridge the gap that exists between business departments (where business needs are conceived) and the IT department (where software to support business needs is created). In Gruhn and Schäfer (2015) sets out the advantages of each cycle:

- BizDevOps allows individuals in business departments to express and review business needs in a practical way, provide rapid feedback, and support the alignment of IT with the Business (the 'Biz' in BizDevOps).
- BizDevOps enables IT departments to manage the entire application development process to ensure the high quality of software artifacts (the 'Dev' in BizDevOps).
- BizDevOps provides a set of processes and tools that allow for the automation and integration of the software delivery and deployment chain (the 'Ops' in BizDevOps)."

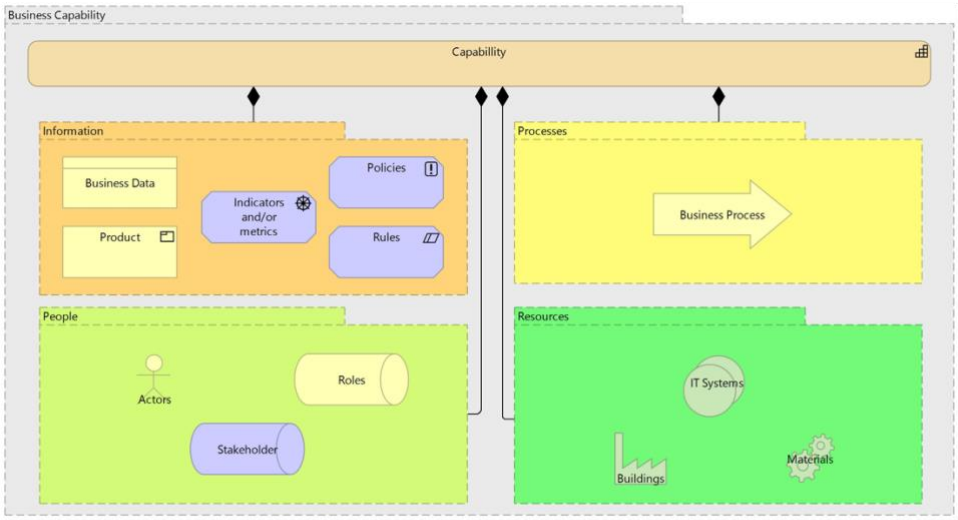
What is a Business Capability?

The Open Group, in its TOGAF standard for applying Enterprise Architecture (The Open Group, 2022a), defines capability as 'an ability to do something', therefore, a Business Capability (BC) represents an organization's ability to achieve a business objective. On the other hand, it can be something that currently exists or something that is required to enable a new direction or strategy.

With this in mind, specifying a BC requires establishing four main components (The Open Group, 2022a) (see Figure 2):

- **People**, representing actors, roles, stakeholders, or business units related to the BC.
- **Processes**, which specify the actions that must be able to be carried out.

- **Information**, representing the business data and knowledge necessary for enabling the business capability. This includes products, policies, and organizational rules, as well as performance indicators and metrics.
- **Resources**, which can represent various tools, materials, or physical assets that enable the proper execution of the defined processes. This category includes elements such as information systems, applications, real estate, machinery, and vehicles.



Legend

Layer	Element	Definition	Notation
Motivation	Stakeholder	Represents the role of an individual, team, or organization (or classes thereof) that represents their interests in the effects of the architecture.	Stakeholder
	Principle	Represents a statement of intent defining a general property that applies to any system in a certain context in the architecture.	Principle
	Constraint	Represents a limitation on aspects of the architecture, its implementation process, or its realization.	Constraint
	Driver	Represents an external or internal condition that motivates an organization to define its goals and implement the changes necessary to achieve them.	Driver
Strategy	Capability	Represents an ability that an active structure element, such as an organization, person, or system, possesses.	Capability
Business	Business Actor	Represents a business entity that is capable of performing behavior.	Business Actor
	Business Role	Represents the responsibility for performing specific behavior, to which an actor can be assigned, or the part an actor plays in a particular action or event.	Business Role
	Business Object	Represents a concept used within a particular business domain.	Business Object
	Product	Represents a coherent collection of services and/or passive structure elements, accompanied by a contract, which is offered as a whole to (internal or external) customers.	Product
	Business Process	Represents a sequence of business behaviors that achieves a specific result such as a defined set of products or business services.	Business Process
Technology	Node	Represents a computational or physical resource that hosts, manipulates, or interacts with other computational or physical resources	Node
	System Software	Represents software that provides or contributes to an environment for storing, executing, and using software or data deployed within it.	System Software
	Equipment	Represents one or more physical machines, tools, or instruments that can create, use, store, move, or transform materials	Equipment
	Facility	Represents a physical structure or environment.	Facility
Generic	Grouping Element	Aggregates or composes concepts that belong together based on some common characteristic.	Grouping
Relationship	Composition Relationship	Represents that an element consists of one or more other concepts.	

Figure 2. Representation of a Business Capability using ArchiMate 3.2 notation (The Open Group, 2022a).

What are the advantages of using a Business Capability?

The use of Business Capabilities offers various advantages for organizations (The Open Group, 2022b). Among these advantages are an improvement in strategic alignment, highlighting the value contributed to products and services, facilitating the management of organizational complexity, and promoting effective communication and collaboration with a shared language. These advantages enable organizations to make more informed decisions and achieve greater coherence in their strategies and business activities.

Business Capability for BizDevOps

The objective of this business capability is to enable companies that are already applying DevOps with an agile focus and wish to migrate to BizDevOps, to take the first step and identify everything necessary to achieve IT/Business alignment without losing agility when using this approach.

In Table 1, the BC for BizDevOps is detailed. It is important to note, as stated by The Open Group (2022a), that the specification of a business capability does not need to define either how or how well things are done, it only needs to establish the minimum necessary that must exist to have the ability described by the capability.

Table 1. General Template of the Business Capability for BizDevOps

Name		Software Development using BizDevOps
Description		The organization's ability or capacity to develop software with BizDevOps. This capability ensures an agile alignment of IT with the business and preserves the benefits and characteristics of DevOps
Components	**People**	BizDevOps team composed of the following roles: • Product Owner • Agility Manager • Other DevOps roles
	Processes	• Process Group of the DevOps Standard – IEEE 2675. • Continuous IT/Business Alignment Process
	Information	• Principles • Values • Metrics
	Resources	• Toolkit

Definition of the BC components:

i. People

The essential roles considered by the BizDevOps Team are the typical roles of DevOps, but some must assume new responsibilities.

- **Product Owner:** In BizDevOps, this role is key in delivering a product that meets business needs and adds value. Their new focus is on aligning IT with business goals. This adds to their usual role of bridging the gap between business experts and the IT team and maximizing the product's value.
- **Agility Manager:** In BizDevOps, this role ensures the team remains agile across all phases of the approach. They create an environment for efficient and productive work. In Scrum and similar frameworks, this role is often filled by the Scrum Master.
- Other DevOps roles should also be considered as part of the team, for example, developers, testers, operations managers, among others (ISACA, 2020; Krishna Kaiser, 2018).

ii. Processes

This component considers the following:

- **IEEE 2675 DevOps Process Group:** The standard for the DevOps approach specifies a series of processes (see Figure 3) that provide guidance on the use of DevOps principles and practices for the processes followed by an organization during the software lifecycle, suitable for its products and services. An organization, depending on its purpose, can select and apply an appropriate subset to fulfill that purpose (IEEE, 2021).

- **Continuous IT/Business Alignment Process:** Continuous IT/Business alignment, as per (Hinkelmann et al., 2016) involves:
    - Establishing/adjusting objectives: strategic and operational objectives for both the business and IT and their relationships.
    - (Re)designing the enterprise: modeling or adapting the business, application, and technology architectures, as well as their relationships.
    - Implementing the enterprise architecture.
    - Monitoring the organization's performance and recognizing the needs for adaptation.

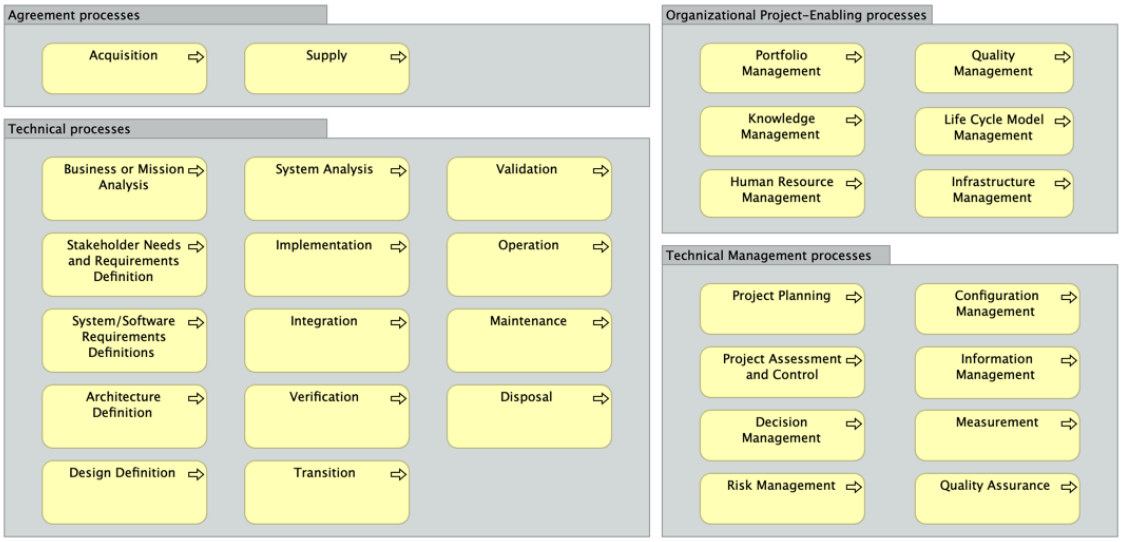


Figure 3. Process Group of the IEEE 2675 DevOps Standard (IEEE, 2021)

iii. Information

Principles, values, and metrics make up this component.

- **Principles:** here are some principles for BizDevOps (IEEE, 2021; Lohrasbinasab, Acharya, & Colomo-Palacios, 2020):
    - **Alignment:** BizDevOps favors the realization of constant alignment of IT with the business.
    - **Agility:** This approach considers agility in all its cycles.
    - **Integrated Team:** it's not three teams working together, but one team with roles in business, development, and operations, collaborating to meet the organization's software needs.
    - **Business First:** BizDevOps focuses on the organization's objectives before technical considerations.
    - **Customer Focus:** BizDevOps adopts a customer-centered view, prioritizing and designing work to deliver value to the customer, as well as identifying and managing risks.
    - **Shift-Left:** this term refers to anticipating those tasks that are typically performed in the final stages of the software development life cycle. This implies the early execution of practices like software quality and security testing.
    - **Continuity in Everything:** in BizDevOps, it means using practices for the automation of processes in business, development, and operations.
    - **Systems Thinking:** in BizDevOps, adopting a comprehensive view motivates the team to fully understand the system from start to finish. Systems thinking can facilitate the resolution of complex and emerging problems that are not easily traced back to a single defect.
- **Values:** BizDevOps has four fundamental values, commonly presented as the CAMS values (Culture, Automation, Measurement, and Sharing):
    - **Culture:** BizDevOps requires a culture of shared responsibility and common goals. This approach aims to promote an enabling culture of communication, collaboration, trust, transparency, and working towards common objectives.

    - **Automation:** BizDevOps promotes and is based on the automation of all processes that allow it to minimize times and, consequently, achieve rapid delivery and a quick response from end users.
    - **Measurement:** BizDevOps seeks to continuously improve and provide visibility in all systems and practices. This is achieved by being able to measure everything (or at least as much as is useful, practical, and feasible to do so). As a result, there are metrics and indicators that can potentially be used to measure BizDevOps.
    - **Sharing:** BizDevOps promotes establishing intuitive and effective communication channels for continuous communication among all team members. The aim is to share both software project concerns and knowledge exchange.
- **Metrics:** as promoted by the "*Measurement*" value of BizDevOps, it's important to have information that allows knowing what is being done well and identifying what needs to be improved. Some examples of metrics for this approach are:
    - **Deployment frequency.**
    - **Wait time for changes.**
    - **Change failure rate.**
    - **Time to restore/recover service.**
    - **System availability percentage.**
    - In the context of agile IT/Business alignment, metrics for this purpose are (Imgharene, Doumi, & Baina, 2020):
        - Number of actors participating to achieve an organization's goal.
        - Number of business processes per organization's objective.
        - Number of actors building/elaborating a change.
        - Number of applications per business process.

iv. Resources

Next, the set of resources that make up this component is described.

- **Toolkit:** This toolkit will support the values and principles outlined in this approach. Each cycle in BizDevOps is composed of stages, seamlessly interconnected as illustrated in Figure 4. At each stage, tools are necessary to enable alignment and agility through automation. For instance, for the *'Verify'*, *'Package'*, and *'Release'* stages, the version control system GitHub can be employed, which facilitates automated pipelines for executing automated tests and tasks related to deployment and continuous integration. Conversely, for the *'Define'*, *'Approve'*, and *'Plan'* stages, there are tools like Jira, designed for project management. An advantage of these tools is their frequent capability to integrate with other systems and automate specific tasks, such as deployment. The tools are not elaborated on in depth as this depends on the technological architecture and infrastructure that each organization employs or wishes to adopt.

Figure 4. BizDevOps Toolkit[1]

[1] https://positivethinking.tech/wp-content/uploads/2022/07/Bizdevops-loop-workload.png

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