

Enterprise Architecture Principles to Foster Societal Responsibility

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Abstract

How to implement sustainability and corporate social responsibility (CSR) is an important question for organisations. In investment decisions, these issues must be taken into consideration because they represent long-term prospects. In discussions about Enterprise Architecture (EA), which provides a long-term view of an organisation's development, these issues are considered by many authors to be an essential part of the EA. However, in practice, architects struggle with how to implement these topics in their EA.

In this paper, we introduce a framework to classify sustainability and CSR goals. Based on this framework, we propose a set of EA principles that architects can adapt to their organisation to tailor the EA to these goals.

Keywords: Enterprise Architecture · Enterprise Architecture Principles · Sustainability · Corporate Social Responsibility · Societal Responsibility Framework.

1. Introduction

Traditionally, Enterprise Architecture (EA) is seen as a method to align an organisation's IT infrastructure with its business goals - aiming for efficiency, optimisation, and innovation (Ross et al., 2006; Tamm et al., 2011). However, with the rise of digital transformation in companies, the scope of EA has expanded from the internals of an organisation to include the organisation's environment. Societal issues such as sustainability and corporate social responsibility (CSR) should nowadays be taken into consideration by enterprise architects in developing blueprints for innovation and digital transformation (Jusuf and Kurnia, 2017; Gampfler et al., 2018). This reflects the growing awareness in society that the impact of an enterprise extends beyond purely economic aspects, as summarised in the triple bottom line (Elkington, 1997, 2018): People, Planet, Profit. This is elaborated in the UN's Sustainable Development Goals (United Nations, 2015), and progress on these goals is yearly evaluated in SDG Progress Reports (see <https://unstats.un.org/sdgs>). For example, in Europe, the European Union shows its commitment to sustainability and corporate social responsibility by the Directive on Corporate Sustainability Due Diligence (CS3D) that requires big companies “to conduct environmental and human rights due diligence throughout their operations, subsidiaries and supply relationships” (Felbermayr et al., 2025, p. 165).

To get an impression of the state of affairs on sustainability and CSR in organisations, Lago et al. (2022) researched the role and importance of these issues in the IT departments of organisations. 44 Practitioners and 23 researchers were questioned in two workshops. Both researchers and practitioners consider business motivation and short-term thinking as the main obstacles in implementing the sustainability and CSR goals of

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their organisation. Enterprise architecture can support overcoming these obstacles, but in practice, many enterprise architects struggle with how to integrate this responsibility towards society into their work. For example, a recent case study at a production company that had sustainability high on its agenda showed that sustainability was not included in their EA (Plessius et al., 2025a). This is no exception: from Bizzdesign's 2025 Annual Report on the State of EA, we learn that around half of the interviewees responded that in their organisation, information on sustainability was not (easily) available (Bizzdesign, 2025).

In this paper, we explore the question of how EA can be leveraged as a strategic tool for sustainable business practices, minimising environmental impact, enhancing social values, and ensuring governance frameworks that prioritise ethical considerations. Our goal is to support enterprise architects by providing guidance on how to incorporate the sustainability and CSR goals of their organisation in the EA and from there, into the organisation's business processes and IT.

The impact of sustainability and CSR (from here on collectively referred to as societal responsibility) on the EA is largely determined by the extent to which an organisation is committed to societal issues. In this paper, we introduce a categorisation of societal responsibility goals. For the different categories in this framework, we provide examples of architectural principles that support these goals. In practice, enterprise architects can refine these general principles for their organisation and use them to include the societal responsibility goals of their organisation in their blueprints.

In the next section, we explore relevant background literature about EA and societal responsibility. In Section 3, we present the framework used to categorise societal responsibility goals, followed by a section in which we use this framework to express EA principles for every category in the framework. We conclude the paper with a discussion of the results and their practical applicability.

2. Background

2.1. Enterprise Architecture and Societal Responsibility

As stated in the Introduction, traditionally, EA aimed for a better alignment between business processes and IT in line with the goals of the organisation. Topics such as compliance, governance, business processes, data and information management, alignment and agility were – and still are – at the core of EA (Plessius et al., 2025b). However, over time, the areas of interest of EA have been extended and nowadays include, among others, societal responsibility (Gampfler et al., 2018; Plessius et al., 2025b). The driving force behind this change has been the increasing importance of digital transformation (Sutherland & Hovorka, 2014; Guandalini, 2022), in which EA can play a key role (Korhonen & Halén, 2017; Wetering et al., 2021).

Societal responsibility issues find their way into the EA with the expanding outlook of EA as summarised in the third school of Lapalme (2012), *enterprise ecological adaptation*, in which EA considers the organisation in its environment. In literature, sustainability as an area of interest to EA is mentioned from around 2012 onwards (Villarreal, 2015; Gampfler et al., 2018), following the discussion about 'Green IT' (Molla, 2009; Elliot et al., 2010). CSR issues follow some years later (Horlach et al., 2015). Nowadays, in academic publications, societal responsibility is seen as an area to which EA should contribute (Gampfler et al., 2018; Zhang et al., 2022; Alghamdi, 2024; Pattij et al., 2024). However, in practice, many architects struggle with how to incorporate societal responsibility in their work (Lago et al., 2022).

2.2. Enterprise Architecture Principles

Based on The Open Group Architecture Framework (TOGAF) - an open, industry consensus framework for Enterprise Architecture - EA principles can be described as: EA principles are fundamental guidelines that inform how an organisation designs, develops, and manages its IT systems and assets, ensuring consistency, coherence, and alignment with business goals. They serve as a roadmap for IT decisions, ensuring that projects and initiatives align with the overall organisational strategy and vision (TOGAF 10, 2022). EA principles

provide the context for EA (Kotusev et al., 2022) and are considered the cornerstones of EA by some authors (Greefhorst and Proper, 2011). We hold the opinion that EA principles demarcate the outer borders of the EA and thus guide decisions made in the EA and in the implementation of the EA. EA principles should therefore be aligned with the strategy, goals and culture of the organisation and should be stable over longer periods of time. As principles are formulated in general terms, they have a much wider scope than many other EA artefacts.

In this paper, we will formulate EA principles only in general terms. In practice, a more detailed description is advisable, for example, using the template of TOGAF (2022), which associates with each principle the *rationale* (the *why*) and the *implications* of applying the principle.

2.3. Enterprise Architecture Principles for Societal Responsibility

Many authors have discussed the role of principles in architecture (Greefhorst & Proper, 2011; Kotusev & Kurnia, 2021; Haki & Legner, 2021), but concrete principles are seldom formulated. Exceptions can be found in TOGAF (2022) and in the book by Greefhorst and Proper (2011), which contains an appendix with 59 principles, where only one is explicitly concerned with societal responsibility but is of a very general nature: “*IT systems are sustainable*” (Greefhorst and Proper, 2011, p.171).

We found no other explicitly formulated EA principles concerning societal responsibility in the literature, but in many publications about IT and corporate responsibility issues, EA principles are implicitly present. Examples can be found in GREAN: Green Enterprise Architecture (Van Devenne et al., 2023). Generally, in the literature, sustainability is seen as an issue that architects can address (Sutherland & Hovorka, 2014; Vandevenne, 2023) while CSR is considered an issue to be monitored by a governance board (Horlach et al., 2015). We hold the opinion that both sustainability and CSR should be addressed in the enterprise architecture.

3. A Framework to Categorise Societal Responsibility Goals

To support architects in incorporating societal responsibility goals of their organisation into their EA, we aim to formulate several general principles on which enterprise architects may build. As societal responsibility covers a broad area, we introduce a framework with three dimensions in which societal responsibility goals can be classified.

We start by classifying societal responsibility goals according to their nature. In this dimension, we differentiate between three types of goals: goals related to energy, to materials used and to working conditions. In Table 1, these categories are described in more detail.

Table 1. Descriptions of the dimension: nature of the goals.

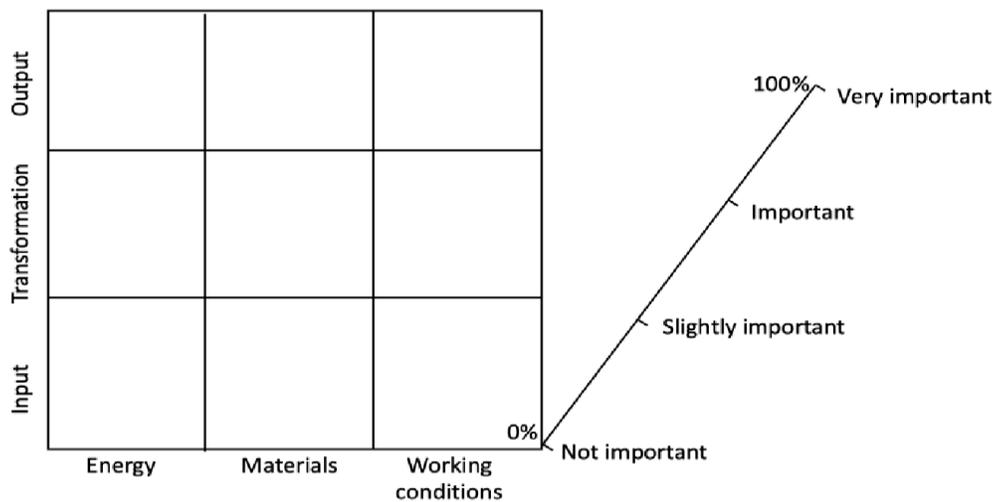
	Goals concerning ...
Energy	...the use of renewable energy and the lowering of the CO ₂ footprint
Materials	... the degree to which the materials used are renewable and have minimal impact on the environment
Working conditions	... the economic, physical and psychological conditions that workers, both in the organisation and in the supply chain, are exposed to

Secondly, we classify societal responsibility goals in accordance with their place in the product life cycle. For this dimension, we view the organisation as a system that transforms its input into output. In Table 2, the categories of this dimension are shown and described in more detail.

Table 2. Descriptions of the dimension: organisation as a system.

Goals concerning ...	
Input	... everything that an organisation uses to produce goods or services. These can include natural resources, human resources, capital, and information
Transformation process	... the business processes that convert the input into output
Output	... the result of the transformation - the goods and/or services that the organisation produces

There is a third important characteristic of societal responsibility goals: their importance in relation to other goals. While some organisations may give absolute priority to societal responsibility goals, in other organisations, they may only be affected if, for example, the costs are not (much) higher than alternatives. Contrary to the previous two dimensions, this characteristic is analogous in nature and may range from 0% to 100% importance. In practice, in most cases, an exact percentage cannot be given, but the relative importance of the goals is expressed in terms like ‘very important’ and ‘less important’. In our framework, we will use a 4-point scale ranging from ‘very important’ to ‘not important’ (see figure 1). It should be noted that the qualification ‘not important’ is only of theoretical importance, as in practice, goals that are not important will not be found in an organisation.

**Figure 1.** Classification framework for societal responsibility goals.

4. EA Principles to foster Sustainability and CSR

Based on the framework for societal responsibility goals as depicted in Figure 1, we have formulated principles for applying these goals in the EA. As the relative importance of a principle depends entirely on the organisation, we will classify the societal responsibility principles in the first two dimensions of our framework only.

Table 3. A set of EA principles for societal responsibility

	Energy	Materials	Working conditions
Input	IT infrastructure components are selected based on their energy efficiency	IT infrastructure components are selected based on their material footprint	Transparency of the supply chain of source materials is required In the supply chain, working conditions are at least in line with the UN standards
Transformation	Energy efficiency is prioritised across all organisational units and functions	Materials are used in line with circular economic principles	Working conditions in the transformation processes conform at least to the UN standards and national regulations Decisions are compliant with ethical principles
Output	The carbon footprint of finished products is minimised	Materials used in finished products can be recycled	The life cycle of finished products is transparent

The third dimension of the framework, the relative importance of the societal responsibility goals, can be added in several ways. The first is to introduce a modifier for the principles included in Table 3. For example, if the prioritising of energy in the transformation process may not lead to a higher price in the finished product, the corresponding principle can be modified to: *If there is no effect on the price of the finished products, energy efficiency is prioritised across all components, ...* Another example can be found in the Input/Materials cell, which may take into account quality attributes as well by modifying it to: *Source materials that fulfil the minimum quality requirements, are selected based on their material footprint.*

This method can make the principles less stable over time, so we prefer another solution: to explicitly include their relative *Importance* in the detailed description of the principle. In the template of TOGAF (2022), the field *rationale* is designated to describe the relation with other principles. But it is quite feasible to add an extra field of *importance* to describe the relation and dependencies with other principles.

When principles collide (or collide with the overall goals of the organisation), a governance board can make a decision. In the same example as above, the principles: *energy efficiency is prioritised across all components* and *costs should be kept as low as possible*, might collide. In that scenario, the governance board should decide which way to go.

5. Discussion and Conclusion

In the preceding sections of this paper, we have introduced a framework to categorise societal responsibility goals and used that framework to formulate principles for the EA. The framework can easily be refined if the need arises but this may give rise to a plethora of overlapping principles. It may be argued that there is already some overlap in the current framework, as the principles in the output phase more or less imply the principles in the preceding phases, and as such, the principles in the input and transformation phases should be seen as implications of the principles in the output phase. This stance is in line with the function of the principles in the framework: to support the enterprise architects in the area of societal responsibility for their organisation. Another way to limit the number of principles is to make combinations. For example, the principles about energy consumption in the input and transformation phases can be combined into: *Energy efficiency is prioritised both in the components selected and in the production of our products.*

In practice, we see that societal responsibility often conflicts with other interests. It is important to have a clear mechanism for dealing with these conflicting interests. We propose a governance board where decisions can be taken and maybe generalised so they can become part of the underlying principles.

The principles that are introduced in this paper are superficially described. They need to be tailored to the organisation. Their main goal is to support architects in deciding what societal responsibility means in their organisation and how it can be implemented by concretising a more abstract principle as “*IT systems are sustainable*” (Greefhorst and Proper, 2011, p.171). We expect that the principles as formulated in Table 3 are a useful tool for architects on how to implement societal responsibility goals and can be used as a starting point for further enterprise architectural work.

Declarations

Competing Interests The author declares no competing interests

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