

Outcome Specification:

Digital Sustainability Canvas (DSC)

Within the Erasmus+ Knowledge Alliance ProDiT – Projects for the Digital Transformation

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1. Summary

Digital transformation can cause sustainability impacts that are important to assess and understand. This, especially before undertaking a digital transformation endeavour to allow the possibility of reducing the negative impacts to the economy, society, and ecology, and maximize the positive effects.

Overall Goal: The digital transformation is conducted with the goal to develop a new product or service, make a process more efficient, establish a new business model, or to develop an organisation to another level of maturity. The outcome of the project is therefore very relevant for planning a digital transformation project (DTP) and the outcome is intended to cause an impact. It also can cause a lot of side effects or non-intended impacts. Assessing and determining the impact of a DTP (e.g. with respect to people, planet, and profit) is therefore a core issue in sustainable project management. A sustainability canvas helps to reflect on sustainability in a comprehensive way, looking at it from all viewpoints. Hence, the goal is to develop a Digital Sustainability Canvas (DSC) for the planning and assessment of DTP.

Purpose and Requirement Analysis: The Digital Sustainability Canvas (DSC) is used for:

- Analysing the sustainability of a DTP from different viewpoints
- Support the definition of DTP with a positive impact.
- Controlling DTP and steering the towards the intended outcome and impact
- Supporting the consideration of sustainability aspects (e.g. the impact on people, planet, profit) in the digital transformation
- Visualizing the sustainability analysis of DTP in a standardized way

Current State-of-the-Art:

Canvas models are intensively researched and used, there is a huge variety of approaches and models. Sustainable project management used canvas models already. Nevertheless, the sustainable digital transformation is not in the focus.

Problem Statement: Existing canvas models do not sufficiently support the analysis of the digital transformation making them unsuitable for sustainably managing DTP.

Research Plan: Key research questions are:

RQ1: How do we keep the impact of the transformation in mind?

RQ2: How do we guarantee sustainability?

RQ3: Which is a suitable assessment tool that can provide a clear understanding of the business model and sustainable impacts that come along with a DTP?

RQ4: How would the use of such tool look like when assessing a DTP?

Dissemination & Standardisation: Results are planned to be disseminated and standardized with the IEEE and IPMA.

Quality Evaluation: It will be evaluated by students, professors and IT/media specialists to get feedback for improvement. This iteration continuing during 3 years in different universities and publishable release will be produced in each iteration.

Change History & Ownership:

Release V1.0: Initial version of the specification of the DSC, OpenCoP on Sustainable Digital Transformation, 09.09.2022. Authors: Carolina Cruz-Villazon, Abouzar Daneshpajouh, Jorge Maldonado Carranza, Maider Iturrondobeitia, Jose Ramon Otegi-Olaso, Corinna Köbler, Nora Johanne Klungseth.

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2. Introduction to the Digital Sustainability Canvas (DSC)

The Digital Sustainability Canvas (DSC) is a visual framework and a guideline for the analysis of the sustainability aspects for a digital transformation project (DTP) under various viewpoints, e.g.:

- Impact of the DTP, especially on people, planet, and profit (PPP).
- Determination of the effect of project factors on sustainability and intended effect.
- Assessment and controlling of DTP under sustainability aspects.
- Communicating and visualizing the sustainability aspects in a graphical canvas model.
- Leading to a more sustainable digital transformation.

For so, it is needed to have a tool for the identification of those sustainability impacts. There are a series of tools already available for the assessment of business models and projects such as:

- Business Model Canvas from Osterwalder and Pigneur
- Triple Layered Business Model Canvas from Joyce and Paquin
- Sustainable Project Management Canvas from Schipper and Silvius
- The Digital Canvas from Schlimbach and Asghari
- Sustainable Business Model Canvas from Gerlach
- Digital Products Ethics Canvas from Gerlach.

The main research topics in this context are:

- Literature review on existing canvas models with the goal to develop an overview.
- Literature review on sustainability aspects regarding digital transformation and DTP.
- Concept for a DSC
- Concept for a sustainability planning and controlling, e.g. using result-oriented monitoring (RoM) and cause-and-effect-networks like the IOOI system.
- Concept for a holistic approach for sustainable DTP and sustainable digital transformation, using the DSC and the controlling tools.
- Validation of the concepts in the use cases of DTP and digital transformation of products, services, organisations and business models.
- Validation of the concepts in consulting.

3. Description of the planned research

3.1 Overall Goal

The digital transformation is conducted with the goal to develop a new product or service, make a process more efficient, establish a new business model, or to develop an organisation to another level of maturity. The outcome of the project is therefore very relevant for planning a DTP and the outcome is intended to cause an impact. It also can cause a lot of side effects or non-intended impacts. Assessing and determining the impact of a DTP (e.g. with respect to people, planet, and profit) is therefore a core issue in sustainable project management. A sustainability canvas helps to reflect on sustainability in a comprehensive way, looking at it from all viewpoints. Hence, the goal is to develop a DSC for the planning and assessment of DTP.

3.2 Purpose and Requirement Analysis

The research about projects for the digital transformation covers different views on the topic, especially the project view, the people view, the organisational view, and the impact view. The research on the DSC is a relevant part of the impact view, addressing two research questions: How do we keep the impact of the transformation in mind? How do we guarantee sustainability?



Figure 1 Impact (goal) focus of the research on managing the digital transformation with projects.

The DSC is a visual framework and a guideline for the analysis of the sustainability aspects for a DTP under various viewpoints, e.g.:

- Impact of the DTP, especially on people, planet, and profit (PPP).
- Determination of the effect of project factors on sustainability and intended effect.
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3.3 Current State-of-the-Art

[1] provide a literature review and impact analysis of sustainability in project management and conclude with three shifts that characterise the integration of sustainability and project management. [2] present a maturity model that assesses the level of consideration of sustainability in projects, and the same authors present a sustainable PM canvas to help PM practitioners to develop a sustainability management plan [3]. [4] propose a design tool, that structures sustainability issues in business model innovation by adding environmental and social layers based on a lifecycle and stakeholder perspectives, respectively. [5] present a model to support the design and assessment of business models with a sustainable perspective, as well as authors propose an evaluation method to assess the model.

[6] identify the disruptions driven by digital transformation in the environmental sustainability domain and present a framework focusing on transformations in pollution control, waste management, sustainable production, and urban sustainability; authors also propose different research agenda points, including those on digital transformation strategy and environmental sustainability.

The concept of sustainable development was first introduced in 1987 by the World Commission on Environment and Development in their report named Our Common Future commonly known as the Brundtland Report [7]. There, the World Commission on Environment and Development defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” [8]. So, being a topic spoken of since 1987, sustainable development is not an emerging subject but one that remains relevant until today. Furthermore, [8] mention that it is imperative when taking a decision, to consider how the present actions will affect the economy, society, and environment, not only today but also in the future, and the effects this might cause in the surroundings. The aforementioned economy, society, and environment constitute the three pillars of sustainable development [8].

Digital Transformation

Organizations are going through a digital transformation process by transitioning towards new business models in which emerging technologies play a key role [10]. For [11] digital transformation is “sustainable, company-level transformation via revised or newly created business operations and business models achieved through value-added digitization initiatives, ultimately resulting in improved profitability”. In addition, [11] consider that the implemented technologies must not only create added value for the organization but also for the involved stakeholders.

There are five main challenges to overcome when performing transformation projects [12]:

- organisational resistance to change
- lack of a clear vision for a digital customer journey
- ineffective gathering and leveraging of customer data

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- inflexible technology stack and development processes
- real success in digital is rarely about providing the exact same products and services through a digital pipe.

Taking this into account, it is important to consider the theory of change management when undertaking a digital transformation project.

Digital Transformation and Sustainability

Digital transformation can cause sustainability impacts that are important to assess and understand. This, especially before undertaking a digital transformation endeavour to allow the possibility of reducing the negative impacts to the economy, society, and ecology, and maximize the positive effects. For so, it is needed to have a tool for the identification of those sustainability impacts. There are a series of tools already available for the assessment of business models and projects such as:

- Business Model Canvas from Osterwalder and Pigneur
- Triple Layered Business Model Canvas from Joyce and Paquin
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3.4 Problem Statement

Nevertheless, none of the previously mentioned tools were made for the specific purpose of assessing DTP from a sustainable development perspective. Ergo, as part of ProDiT a suitable tool must be developed, being the "Digital Sustainability Canvas". The main objective of the DSC is to provide an understanding of how the organization creates and delivers value through a DTP and to create consciousness of the sustainability impacts that entail with them.

A key element of a successful digital transformation is to ensure that top-level managers have a deep understanding of how digital solutions will deliver value to the organization. With these aspects in mind, assessing a business model becomes critically important while undertaking a digital transformation process.

3.5 Research Plan

A) Research Questions and Hypotheses

Form the overall project goal, the following research questions are derived:

- How do we keep the **impact** of the transformation in mind?
- How do we **guarantee** sustainability?
- Which is a suitable assessment tool that can provide a clear understanding of the business model and sustainable impacts that come along with a DTP?

- RQ4: How would the use of such tool look like when assessing a DTP?

The DSC should support:

- Analysing the sustainability of a DTP from different viewpoints.
- Support the definition of DTP with a positive impact.
- Controlling DTP and steering the towards the intended outcome and impact.
- Supporting the consideration of sustainability aspects (e.g. the impact on people, planet, profit) in the digital transformation.
- Visualizing the sustainability analysis of DTP in a standardized way.

B) Research Methods

The development of the initial DSC model was done through a Master Thesis (Maldonado, 2022). In this thesis, an integrative literature review was conducted, focusing on sustainability, digital transformation, and the suitability of the Business Model Canvas as an assessment tool. In addition, two tools derived from the Business Model Canvas and designed to incorporate sustainable development considerations were also analysed: the Three-Layer Business Model Canvas and the Sustainability Project Management Canvas.

For the integrative literature review, Maldonado (2022) followed the principles described by Torraco (2005). According to the author, integrative literature reviews aim to establish new frameworks and methodologies by evaluating, combining, and integrating knowledge on a particular topic. Furthermore, Torraco (2005) states that integrative literature reviews are effective in addressing emerging topics. The whole process followed a five-stage approach.

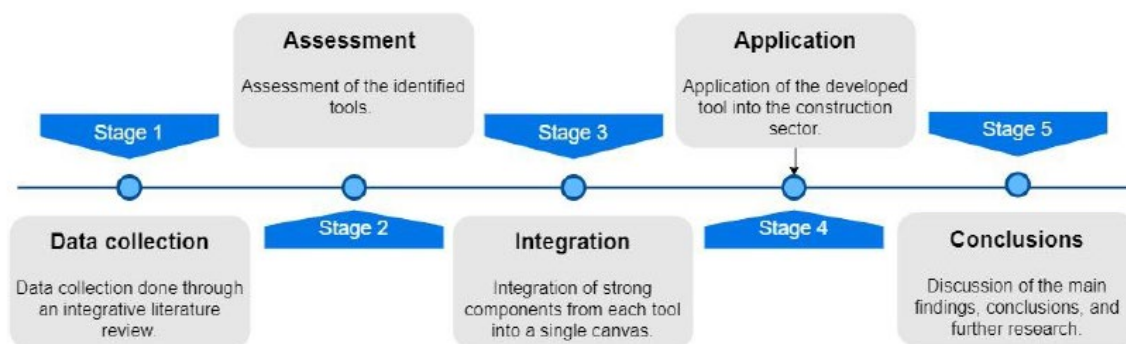


Figure 2 Integrative literature review process (Maldonado, 2022 adapted from Torraco, 2005)

Maldonado (2022) identified related work on several business model assessment tools within the literature. These tools include the Business Model Canvas by Osterwalder and Pigneur (2010), the Triple Layered Business Model Canvas by Joyce and Paquin (2016), the Sustainable Project Management Canvas by Schipper and Silvius (2017), The Digital Canvas by Schlimbach and Asghari (2020), the Sustainable Business Model Canvas by Gerlach (2015) and the Digital Products Ethics Canvas by Gerlach (2019).

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The DSC integrates selected elements of the BMC, the TLBMC, the SPMC, the DDC, the DPEC and the SBMC into a canvas that assesses DTP from a sustainable development perspective. This aims to offer a clear and holistic view of the sustainable impacts of DTP. The main objective of the DSC is to understand how the organisation creates and delivers value through a DTP and to bring awareness of related sustainable impacts.

C) Research Plan

This is a draft version of the research plan:

Step 1: Conduct Integrative Literature Review. Conduct an integrative literature review of the relevant references.

Step 2: Develop DSC Model. Develop the DSC model based on insights derived from the literature review.

Step3: Apply DSC in Master Classes. Use the DSC model within master classes, applying it to a case study and supported by a guideline.

Step4: Student Evaluation. Students evaluate the DSC's results, applicability, comprehensibility, and clearness.

Step 5: Modify and Improve Model. Adjust and improve the DSC model based on feedback received from student evaluations.

Step6: Apply in Partner Companies. Use the improved DSC model in partner companies and collect feedback.

3.6 Dissemination & Standardisation

Results are planned to be disseminated and standardized with the IEEE and IPMA, e.g.:

- IEEE ETEMS conference series
- IPMA World Congress
- AIEPRO (IPMA) conference series and TechTalks

3.7 Quality Assurance - Evaluation

Quality Assurance and Evaluation are done via the following mechanisms:

- Quality surveys among participants
- Review and release of results via Internal Evaluation Board (IEB)
- Publication in peer-reviewed conferences and journals
- Test in selected case studies

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