



✓ Urgent Up-Skilling

Introduction to the Topic of Twin Transition



Co-funded by
the European Union

Licensed under CC BY 4.0



Introduction to the Topic of Twin Transition

What is Twin Transition and how can digitalization help organisations for achieving their sustainability goals?

And what does this mean for marketing research, education and profession?



 Urgent Up-Skilling

This course is provided by:



January 16, 2025

Agenda

1. Digital4Sustainability Project
2. Twin Transition (aka Twin Transformation)
3. Skills for TT
4. Marketing and Twin Transformation?
5. Going through some marketing literature concepts & examples related to digital and/or sustainable transformation
6. Challenges & Green-X-ing
7. Introducing three statements for discussion
8. Discussion in groups
9. Plenary reflections





Meet the speaker

Anand Sheombar
Tara Vester

Stichting Hogeschool Utrecht



a value-adding interplay between digital and sustainability transformation efforts that improve an organization by leveraging digital technologies for enabling sustainability and leveraging sustainability for guiding digital progress

Twin Transition

(Christmann et al., 2024, p. 7)

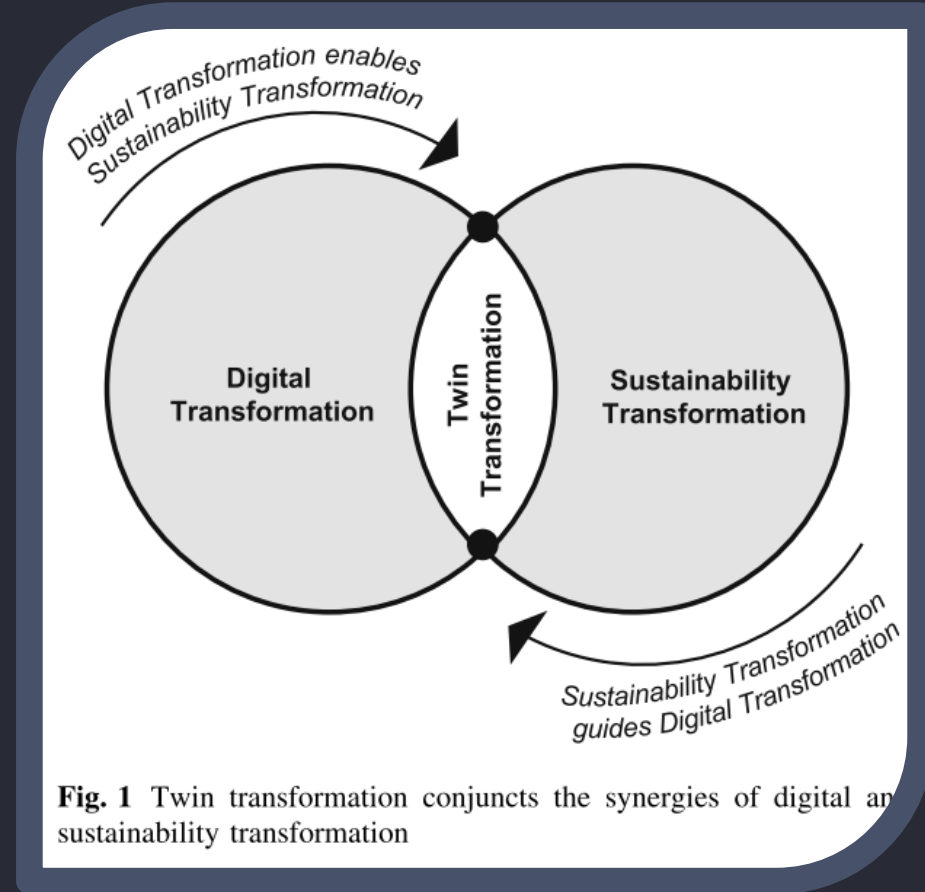


Fig. 1 Twin transformation conjuncts the synergies of digital and sustainability transformation

Twin transformation skills - Skills gap

Twin transition/transformation still in early stage:

- use cases and business models are lacking
- already a skill shortage experienced on digital and sustainability transformation skills

Situation will worsen as demand for twin transition competences will increase

Low-skilled labor is automatized, new jobs are more complex, need a larger variety and more diverse skills, and have a higher educational profile > SKILLS MISMATCH

Institutes for higher education need to adapt but cannot keep up with the rapid development

Twin transformation skills - Knowledge gap

- Companies are unsure what skills they need and what they have in-house
- Large number of TT skills mentioned in literature; indication that synergy between digital and sustainability skills is needed (more than sum of parts)
- Total overview of skills > impossible to find in a single employee
- Insufficient insights to distinguish per role, region, sector, maturity level and size of company

MORE WORK NEEDED

Digital4Sustainability – Shaping the twin transition

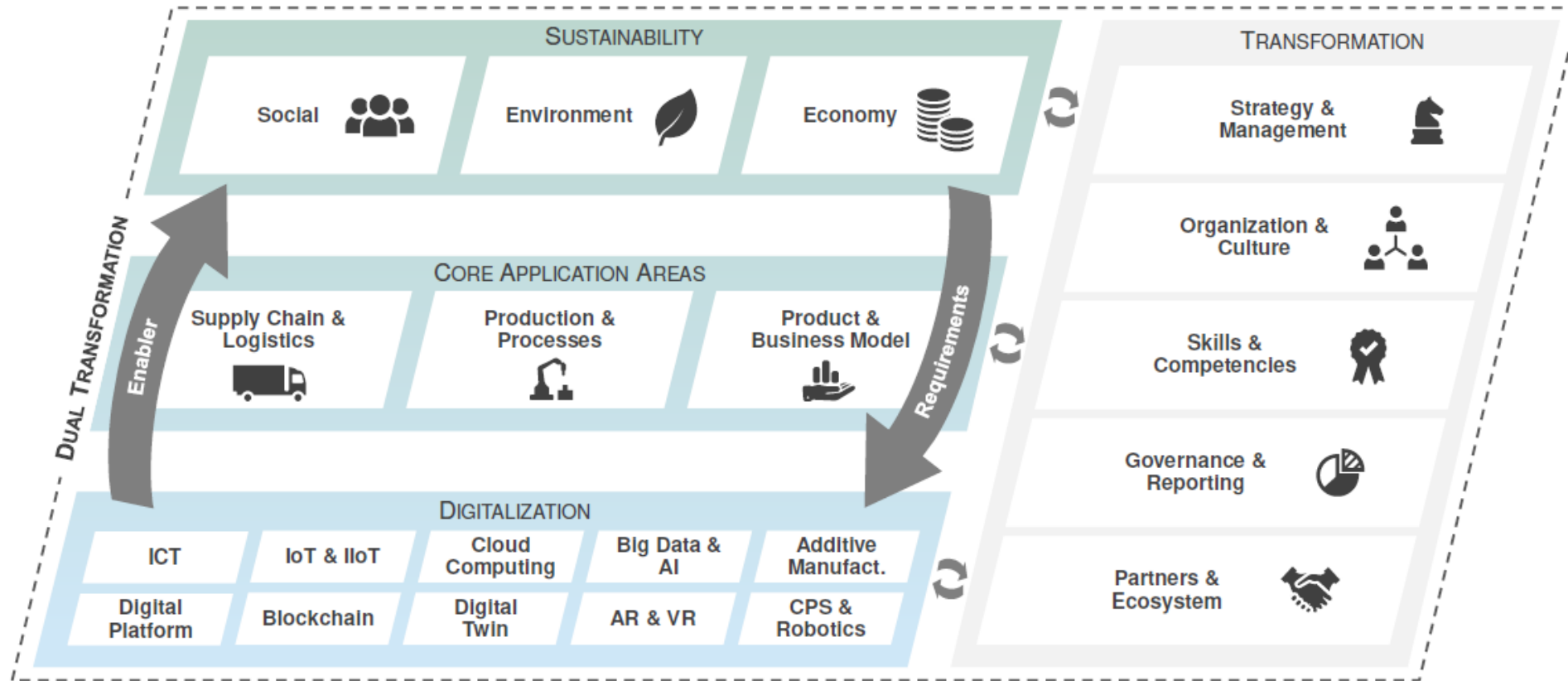


Driving innovation
in digital & sustainability
practices to boost Europe's skills for the twin
transition

4-year EU funded project
(2024–2028)

29 members of the
Digital Large-Scale
Partnership under
the Pact for Skills
from 13 EU countries

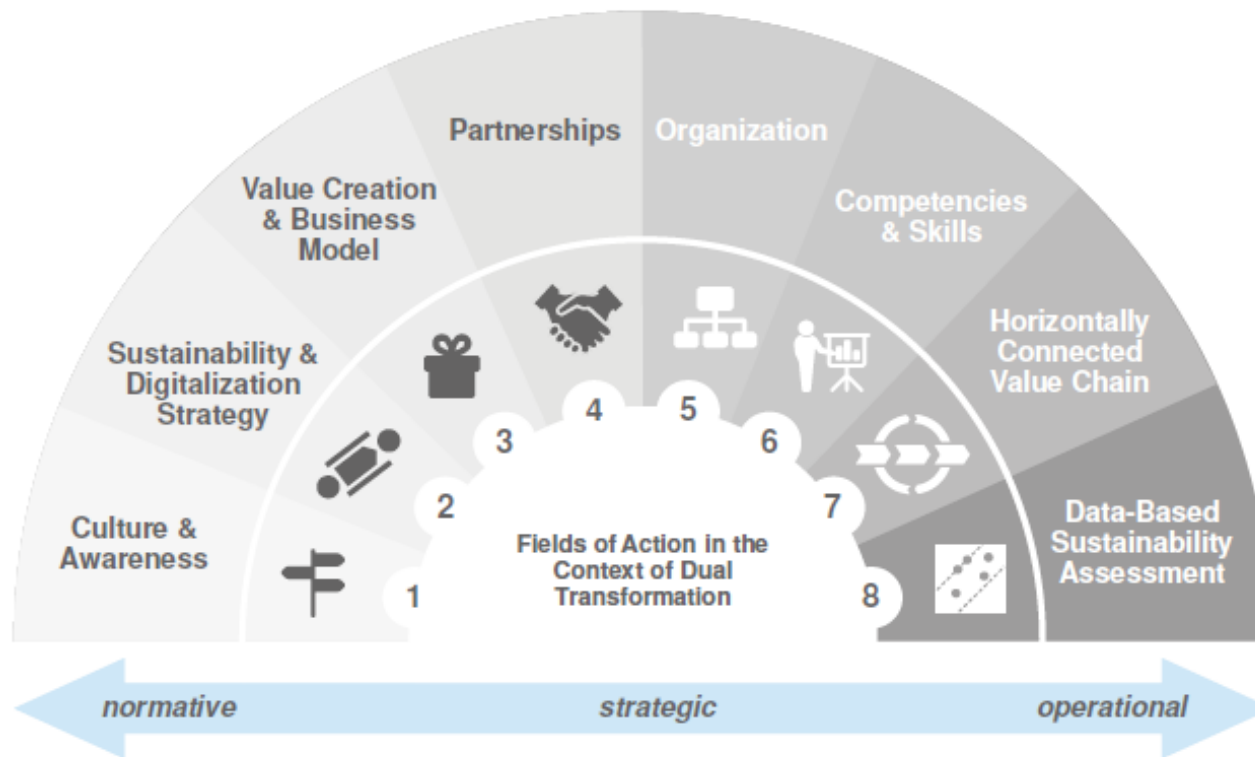
A Framework for Dual (Digital & Sustainability) Transformation



Framework for Dual Transformation

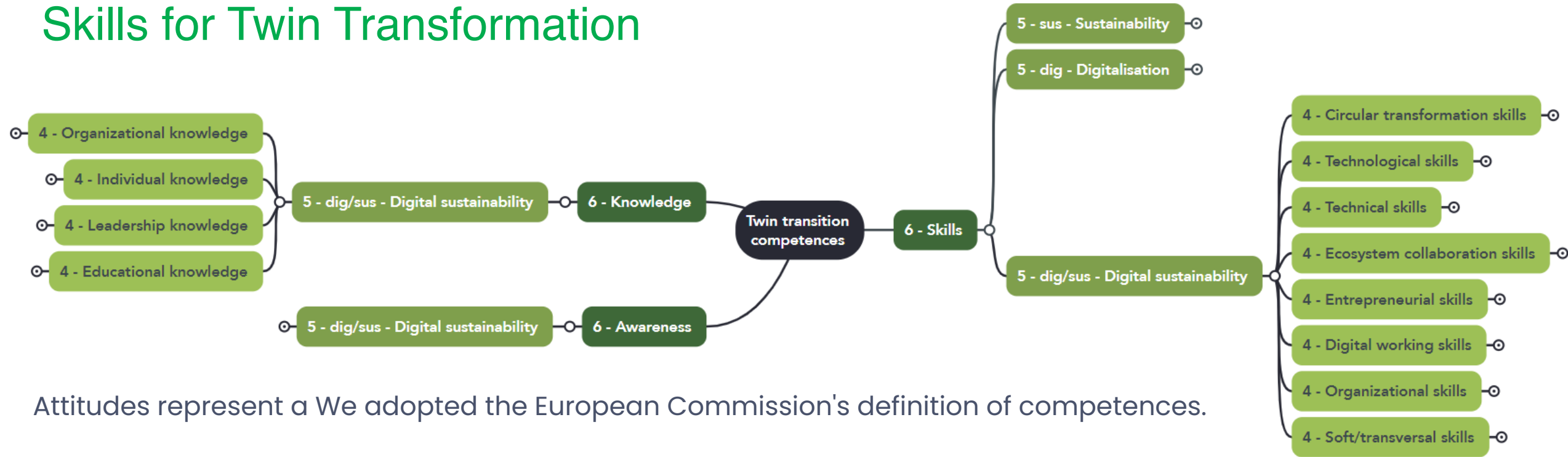
Source: Kürpick, C., Kühn, A., Olszewski, L., & Dumitrescu, R. (2023, April). Framework for Dual Transformation: A Systematic Literature Review on the Interplays between Digitalization and Sustainability

Different fields of action for Twin Transformation – similar to Marketing discipline?



Fields of Action in the Context of Dual Transformation, source: Kürpick et al. (2023)

Skills for Twin Transformation



Attitudes represent a We adopted the European Commission's definition of competences.

Where competences are described as an integrated set of knowledge, skills and attitudes:

- Knowledge consists of established theories, concepts, facts and figures contributing to understanding a given subject.
- Skills comprise manual and cognitive abilities to put acquired knowledge into practice.
- Mindset or tendency to behave or react in a particular way in a particular context

Pivotal role Strategic Marketing (profession) for Twin Transformation

Strategic Marketing as a Catalyst for Twin Transformation (Aagaard & Vanhaverbeke, 2024):

- Driving Sustainable Value Propositions
- Leveraging Digital Tools
- Adapting to Regulatory and Market Demands

Sustainable Marketing: Aligning Business Practices with Environmental Goals

Social Marketing: Driving Behavioural Change for Twin Transition

Digital and Sustainable Transformation Skills for Marketing Professionals

Role of Policy and Organizational Support (Veit et al., 2024)

- Marketing professionals can use their expertise to influence policymakers and promote regulations that support sustainable digital transformation
- Marketing teams can lead internal campaigns to foster a culture of sustainability and digital innovation

Definitions overview

In the literature we find definitions on the following terms:

- Green advertising
- Green marketing
- Sustainability/sustainable marketing
- Digital marketing
- Digital green marketing
- Social marketing
- Smart sustainable marketing
- Critical marketing

Definitions list (1 of 4)

Green advertising

- The advertising efforts and techniques focused on creating these shifts toward the consumption of green products are referred to as green advertising (Alkhatib et al. 2023).

Green marketing

- Green marketing means **the use of marketing strategies** through product redesign, sustainable manufacturing, and integrated marketing campaigns. The main objective of green marketing is to position environmentally friendly products in the market and appeal to environmentally conscious consumers (Alkhatib et al. 2023).
- Green marketing aims to develop sustainable products and services with behaviors such as reduced packaging and efficient energy consumption by placing sustainability at the center of marketing and business processes in organizations (Gordon et al. 2011; Aydin et al. 2023).
- According to Polonsky and Rosenberger (2001), Green marketing may be described as a comprehensive and integrated strategy that involves ongoing assessment of how businesses can attain their corporate objectives and fulfill customer demands, all while **maintaining a focus on environmental friendliness** (Aydin et al. 2023).
- Green marketing is the marketing application of environmentally conscious business (Gigauri et al. 2023).

Definitions list (2 of 4)

Digital green marketing

- Digital green marketing (Alkhatib et al. 2023).

Smart sustainable marketing

- Smart sustainable marketing (Kalogiannidis et al. 2023).

Social marketing

- A marketing model that not only pleases the consumers but also tries to product solutions
. According to Kotler, in the social marketing model, businesses will satisfy the desires and needs of their customers more effectively than their competitors, while not neglecting the benefits of the society (Gigauri et al. 2023).
- The American Marketing Association defines social marketing as the discipline that aligns with organizational activities the creation, communication, distribution and exchange of value propositions from customers to meet market needs, thus emphasizing the important role of the consumer/citizen and equating and enhancing it with an organizational role in this behavior change procedure (Rothschild, 2000; Gigauri et al. 2023).

Definitions list (3 of 4)

Sustainability/sustainable marketing

- Sustainability marketing takes *an holistic approach*, and involves the inclusion of the entire community, including its social objectives and efforts toward environmental preservation. It necessitates the active participation of both national and local governments, organizations, and the general population, along with essential resources such as human expertise, financial backing, and infrastructure (Alkhatib et al. 2023).
- Sustainable marketing is the implementation of all reasonable efforts to produce, price, distribute, consume, and reclaim products in a manner to achieve ecological, economic, and social objectives (Mateev & Nightingale, 2020, p. 285).
- Sustainable marketing involves integrating sustainability principles into all aspects of marketing, from product design and packaging to advertising and distribution, aiming to minimize negative environmental impacts while maximizing positive social and economic benefits (Fisher, 2019). (Fatimi 2024).
- Three kinds of sustainable marketing (Nozari et al. 2021):
 - **Green marketing (ecological)**: developing and promoting environmental sustainability in marketing and company strategy, as well as tactical and operational layers of management (e.g. business processes).
 - **Social marketing (social)**: using marketing tools, communication channels, etc., to encourage sustainable behavior, e.g., green lifestyle, no-waste lifestyle, or to build loyal customer groups identifying with a sustainable development idea, sustainable lifestyle, or sustainable consumerism ethos.
 - **Critical marketing (economical)**: achieving business goals while managing resources effectively, e.g., closed-loop supply chain, circular economy idea, green (but profitable) innovations, and adjusting the marketing strategy and toolset to this approach.

Definitions list (4 of 4)

Digital marketing

- Digital marketing is simply using electronic devices and the means of digital communication (mainly the internet or text messages) to reach potential clients, connect with them, and convince them to purchase the product "source" (Alkhatib et al. 2023).
- Digital marketing, operating within a digital environment, utilizes the internet and electronic devices through online platforms and channels to promote, sell, and deliver products and services. It encompasses various strategies and methods, including advertising, promotion, social media marketing, email marketing etc., with the aim of attracting and engaging target audiences and achieving brand promotion and sales growth (Amiri et al., 2023; Khare et al., 2023; Shankar et al., 2022). Uit Jin et al. 2024.
- Digital marketing in the era of sustainability is an approach aimed at
 . In this context, companies seek to utilize digital tools and strategies to promote sustainable initiatives, reduce their environmental impact, engage consumers in responsible actions, and build a brand image aligned with sustainable values (Moleiro & Meireles 2023).

Why do sustainable digital marketing?

Alkhatib et al. 2023:

- By adoption environmentally conscious actions, companies can effectively capture the attention and loyalty of critical target demographics, such as Generation Z, **in order to align with their values to enhance brand reputation and foster long-term brand loyalty.**
- Digital marketing has become a powerful tool for reaching the customer and researching the market and understanding the customers, their needs, their demographics variables, and the connection of these variables with the desirable products. This is all done automatically using modern digital media, **increasing the efficiency of market research and significantly reducing the costs**, which is beneficial to both the producer and the consumer.
- Digital green marketing **change people's behavior towards sustainability and the consumption of green products.**
- Consumers are **willing to pay a premium price for eco-friendly goods and intention to purchase at higher price.**
- Having a green image and offering high-quality green products contribute significantly to **customer satisfaction.**

Why do sustainable digital marketing?

Aydin et al. 2023:

- AI is reshaping the technical landscape of enterprises and will change how people interact with information, technology, brands and services. How companies run their businesses evolves to **be more responsive, productive and competitive.**

Uses of (sustainable) digital marketing *(in marketing)*

Fatimi 2024:

- to understand consumer behavior, optimize product development, and enhance customer experience in a virtual environment (Thompson & Singh, 2019).
- This allows marketers to test and refine strategies in a cost-effective and risk-free manner, leading to more efficient and impactful marketing initiatives (Lee & Kim, 2021)
- This level of insight enables marketers to tailor experiences and messages more precisely to individual consumer preferences and behaviors, thereby enhancing personalization and customer engagement (Patel & Smith, 2020).
- Assess the *digital marketing* and marketing practices virtually (Anderson & Johansson, 2021).
- Not only improve environmental footprint of their strategies, but also to communicate these efforts authentically and effectively to consumers, fostering greater trust and loyalty (Sullivan & Patel, 2022).
- IoT enables tracking and monitoring products throughout their lifecycle, providing valuable data that can be used to improve product design, reduce waste, and optimize resource use (Lin & Morales, 2020).
- AI and big data analytics help understand customer preferences for sustainable products and services (Jensen & Kapoor, 2021).
- Digital platforms can be leveraged to engage with consumers on sustainability issues, build brand loyalty, and promote sustainable consumption patterns (Harper & Singh, 2021).

Uses of (sustainable) digital marketing *(in marketing)*

Nozari et al 2021:

- encourages customers by partnering with them and cooperating with other partners
- advertising solutions

Aydin et al 2023:

- Virtualization: augmented reality and metaverse to spread production and consumption activities on online platforms.
- *Digital simulation*: e.g. predictions about power needs with algorithms based on AI, and using digital simulation to obtain information about all life cycles of a product.

Moleiro & Meireles 2023:

- Communication and awareness
- Promotion of sustainable products and services
- Engagement and public involvement
- Sustainable partnership and collaborations

Uses of (sustainable) digital marketing *(in marketing)*

Jin et al. 2024:

- More precise target marketing
- Enhancing (sustainable) image
- Meet customer demands for sense of social responsibility
- Resource optimization
- Dissemination of social responsibility
- Customer relationship management
- Enhancing visibility and reputation
- Better customer group segmentation
- Real environment simulation

Uses of (sustainable) digital marketing *(In adjacent fields)*

Technology/Engineering

Big data analytics to (Jin et al. 2024):

- predictive maintenance
- reducing downtime
- improving production efficiency
- optimize quality control
- optimize production

AI (Aydin et al. 2023):

- to increase production efficiency

Supply chain

Big data (Davies & Chambers, 2021 in Fatimi 2024):

- optimizes demand forecasting and inventory management, reducing costs and enhancing delivery efficiency

Digital Twins (Davies & Chambers, 2021 in Fatimi 2024):

- by enabling a detailed virtual representation of a product or service and its lifecycle, digital twins can offer insights into reducing waste, optimizing resource use, and improving overall environmental performance

Monitoring and tracking (Aydin et al. 2023):

- create e.g. Digital product passports

AI and data analysis (Aydin et al. 2023):

- better informed decision making

Strategic Management

Sustainable digital marketing to

Jin et al. 2024:

- strengthen departmental ties
- control service costs
- create new business models and management strategies to adapt to and lead trends
- intelligent decision support to formulate more strategic and informed plans

Nozari et al. 2021:

- adjust the mission of the organization with long-term goals
- long-term plans of developing the operation
- develop dissemination strategies

Case Study (Fatimi 2024)

A consumer electronics company utilized Distributed **Digital Twins** (DDTs) to simulate the market launch of their new eco-friendly product line.

By integrating IoT data from product prototypes and AI-driven market analysis, the company was able to predict consumer responses and environmental impacts.

The DDT helped optimize the product design for **minimal environmental impact** while ensuring consumer satisfaction.

(1) **Benefits:**

- Improved product sustainability and market fit.
- Enhanced consumer engagement through targeted, sustainable marketing messages.

(2) **Challenges:**

- Complexity in integrating and analyzing diverse data sets.
- Ensuring data privacy and security throughout the process.

Case Study 2: Sustainable Supply Chain Optimization

A fashion retailer deployed DDTs to optimize their supply chain for sustainability. By simulating various supply chain configurations, the retailer identified opportunities to reduce waste, lower emissions, and improve efficiency. The insights gained from the DDT informed decisions on supplier selection, material sourcing, and logistics, significantly reducing the environmental footprint of the retailer's operations.

(3) **Benefits:**

- Reduction in carbon emissions and waste.
- Cost savings through improved supply chain efficiency.

(4) **Challenges:**

- Managing the complexity of global supply chain simulations.
- Balancing supply chain optimization with the need for agility and responsiveness to market changes.

Case Study 2: Digital Marketing Campaign Analysis

A food and beverage company used DDTs to analyze the effectiveness and sustainability of different digital marketing campaigns. By simulating consumer behavior in response to various campaign strategies, the company was able to tailor their digital marketing efforts to maximize engagement while minimizing the digital carbon footprint associated with online advertising.

(1) **Benefits:**

- Increased campaign effectiveness through targeted, data-driven strategies.
- Reduced environmental impact of digital marketing activities.

THE AJHSSR Journal Page | 206

Optimizing the Environmental Sustainability of Marketing Efforts Using...

(2) **Challenges:**

- Interpreting complex consumer behavior simulations to inform marketing decisions.
- Aligning marketing strategies with rapidly changing consumer preferences and sustainability standards.

These case studies demonstrate the versatility and potential of DDTs in enhancing the sustainability and effectiveness of marketing efforts. By leveraging real-time data, predictive analytics, and simulation capabilities, companies can make informed decisions that benefit the environment, consumers, and their bottom line.



Foster **interdisciplinary collaboration** through cross-functional teams to **bridge the gap** between **technical challenges** and **marketing objectives**

Source: Fatimi 2024



Case Study 2 (Fatimi 2024)

Another case study on the application of DDTs by a consumer electronics company aiming to launch an eco-friendly product line.

The company sought to not only meet sustainability goals but also ensure the market success of their new products. It allowed for a comprehensive simulation of the product's lifecycle, consumer interactions, and market dynamics, providing a multidimensional understanding of the launch strategy's potential impacts.

c) Objective:

The primary goal was to optimize the product design for minimal environmental impact without compromising consumer satisfaction and market viability. The company aimed to predict consumer responses, estimate the environmental footprint of the product, and identify the most effective marketing strategies to promote the eco-friendly product line.

d) Approach:

Data Collection: IoT devices embedded in product prototypes collected data on usage, energy efficiency, and consumer interaction patterns.

Simulation and Analysis: Using DDTs, the company created a virtual marketplace to simulate the product launch. AI algorithms analyzed consumer behavior models, while data analytics provided insights into sustainability metrics and market trends.

Strategy Optimization: Based on simulation outcomes, product designs were refined to enhance sustainability features. Marketing strategies were tailored to emphasize the product's eco-friendly attributes, targeting environmentally conscious consumers.

e) Outcomes:

The DDTs enabled the identification of key features that appealed to target consumers while adhering to sustainability criteria, leading to adjustments in product design and marketing messages.

The product launch was highly successful, achieving a positive reception from the target market and surpassing sales projections. The eco-friendly product line was recognized for its innovation in sustainability, enhancing the company's brand reputation.

The simulation provided insights into consumer behavior and market dynamics that were instrumental in developing a targeted and effective marketing strategy, maximizing the launch's impact with minimal environmental footprint.

f) Benefits:

- Precise targeting and messaging led to high consumer engagement and satisfaction.
- The product's sustainability features were optimized, reducing its environmental impact and aligning with the company's sustainability goals.
- The successful launch established a competitive advantage in the eco-friendly consumer electronics market.

g) Challenges:

- Integrating diverse datasets from IoT devices required sophisticated data processing and analysis capabilities.
- Balancing the trade-offs between product sustainability, cost, and consumer expectations necessitated iterative simulations and refinements.
- Ensuring data privacy and security, especially concerning consumer data collected through IoT devices, was paramount.

This case study underscores the power of DDTs in bridging the gap between sustainability and market success. By leveraging real-time data, predictive analytics, and simulation, the company was able to navigate the complexities of launching an eco-friendly product line, demonstrating a forward-thinking approach to product development and marketing.

Examples of companies utilizing sustainable digital marketing

Moleiro & Meireles 2023:

1. Patagonia: Promote green marketing through practices such as using recycled materials in their products, supporting environmental organizations, and encouraging consumer to repair and extend the lifespan of their clothing.
2. Tesla: Mission to accelerate the global transition to sustainable energy through green marketing. The communicate the environmental benefits of their electric vehicle and solar panels, promoting the adoption of clean energy solutions.
3. IKEA: They use materials from renewable sources, encourage product recycling, and implement energy efficiency initiatives in their stores. Additionally, IKEA raises awareness about sustainability through marketing campaigns.

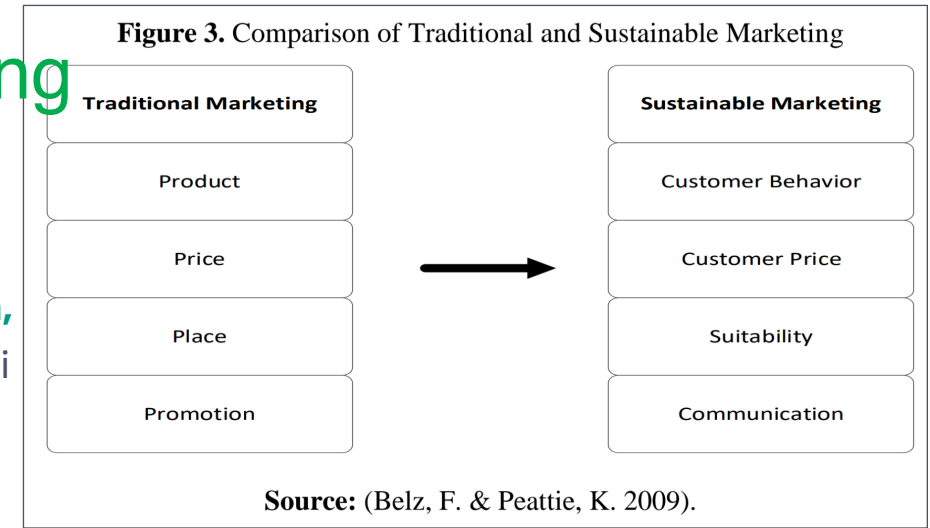
Own experience of researchers:

Koppert Cress: A Dutch horticultural company leverages big data and machine learning to map customers and predict sales across Europe. Start-ups innovate with technologies to optimize and make production processes more sustainable. Digital tools analyze supply chain changes, such as packaging, transport, or new greenhouses, predicting CO2 impact and guiding impactful decisions. Insights are shared with stakeholders through digital marketing technologies.

Traditional marketing vs. sustainable marketing

Aydin et al. 2023:

- **Traditional marketing** has been perceived as a process that identifies and meets needs. **Sustainable marketing includes cooperation, communication, and innovation** that can be shaped according to customer behaviors (Trivedi et al. 2018).



- Today's marketing is called **Marketing 5.0**: the period when consumers interact with artificial intelligence (Zozul'ov & Tsarova 2020). Today's and future marketing understanding **aims to provide the highest level of opportunities to consumers and to create personal interaction environments with them.**
- The function of sales and marketing is significant within the life cycle initiative since it facilitates the effective exchange of information between the consumer and the organization. **To address customers' needs for environmentally friendly goods, it is imperative for the company to possess a comprehensive understanding of the environmental implications associated with a product throughout its entire lifecycle.**

Challenges of green digital marketing

- **Alkhatib et al. 2023:**

- One of the biggest issues is "greenwashing"
- Customer centricity and behavior, competitiveness, supply chains, and competencies are all factors to consider

- **Aydin et al. 2023:**

- Insufficient infrastructure
- Difficulties in keeping up with new developments
- Not being able to adapt to technologies
- High costs

- **Fatimi 2024 (for the adoption of digital twins specifically):**

- Data complexity and volume
- Integration of heterogenous systems
- Real-time data synchronization
- Scalability and flexibility
- AI and machine learning model accuracy
- Privacy and security
- Complexity in modeling marketing's environmental impact

Beware of Greenwashing, greenhushing and greenwishing...

- **Greenwashing** is a practice used by businesses to represent themselves as more sustainable than they truly are.
- **Greenhushing** refers to a company's refusal to publicize ESG information. The company may fear pushback from stakeholders who would find its sustainability efforts lacking or from investors who believe ESG undermines returns
- **Greenwishing**, or unintentional greenwashing, describes a practice where a company hopes to meet certain sustainability commitments but simply does not have the wherewithal to do so. (KPMG 2023)

Source: Greenwashing, greenhushing and greenwishing: Don't fall victim to these ESG reporting traps <https://kpmg.com/us/en/media/news/greenwashing-esg-traps-2023.html>

Thought-provoking Statement 2

How can strategic marketing ensure not to fall into the trap of **Twin Transition Washing**?

For example, firms exaggerating their Green IT efforts (greenwashing) or AI-washing their business (while the use of digital technologies falls behind)



Thought-provoking Statement 3

What role does marketing play in selecting or parting ways with suppliers and collaboration partners to advance the Twin Transformation?



Discussion about Twin Transformation >>>

3 Questions for discussion

Q1: Marketing students & professionals are not yet prepared for Twin Transition, upskilling, deskilling, and reskilling needed. Which skills?

Q2: How can strategic marketing ensure not to fall into the trap of Twin Transition Washing?

Q3: What role does strategic marketing play in selecting or parting ways with suppliers and collaboration partners to advance the Twin Transformation?

1. Choose one of the above statements to discuss with the other participants.
2. If the group has more than 4 people, divide into smaller groups.
3. At the end of the session, we will ask you to share your insights.

Digital and Sustainable Transformation Skills for Marketing Education (& Research and Profession)?

For discussion – this is not a definitive list

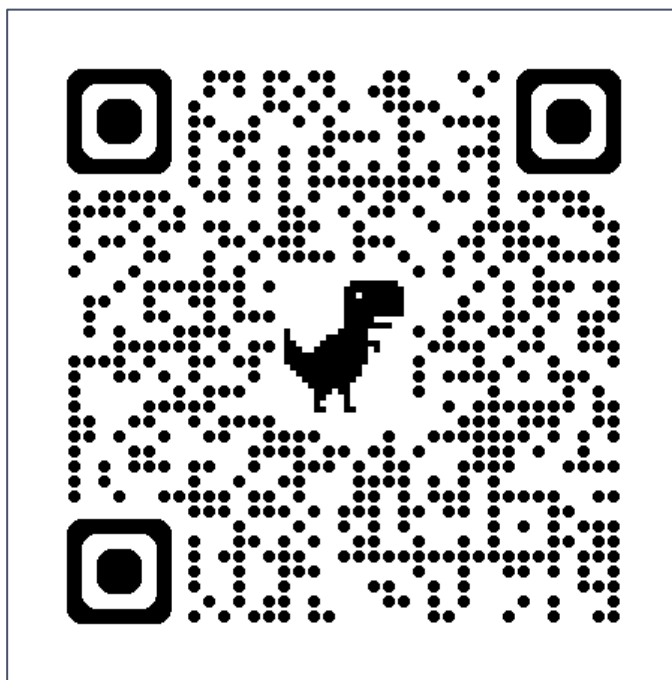
- 1. Digital Skills?** Examples: Data Analytics and AI, digital content creation...
- 2. Sustainability Skills?** Examples: Circular Economy Knowledge, Environmental Impact Assessment...
- 3. Integrated Skills for Twin Transition?** Examples: Dynamic Capabilities, Systems thinking, Green digital skills...
- 4. Soft Skills and Competencies?** Examples: Critical Thinking and Problem-Solving, Adaptability and Resilience...
- 5. Policy and Regulatory Awareness?** Examples: Sustainability Regulations, Digital Policy Frameworks...
- 6. Practical Application and Experiential Learning?** Examples: Case Studies and Real-World Projects, Simulations and Gamification:

Your feedback is much appreciated!

Can you please fill out this survey?

This would help the project to improve and be more relevant to your needs 😊

Go to the short survey via the QR code:



Further Reading - 1

- Aagaard, A., & Vanhaverbeke, W. (2024). The Twin Advantage: Leveraging Digital for Sustainability in Business Models. In A. Aagaard (Ed.), *Business Model Innovation: Game Changers and Contemporary Issues* (pp. 227-262). Springer International Publishing. https://doi.org/10.1007/978-3-031-57511-2_8
- Alkhatib, S., Kecskés, P., & Keller, V. (2023). Green marketing in the digital age: A systematic literature review. *Sustainability*, 15(16), 12369.
- Aydin, s., Nalbant, k. G., & Altuntaş, c. (2023) Artificial Intelligence in Digital Transformation and Sustainable Green Marketing Strategies in the European Green Deal Process. *İMGELEM*, 7 (13): 467-492
- Christmann, A. S., Crome, C., Graf-Drasch, V., Oberländer, A. M., & Schmidt, L. (2024). The Twin Transformation Butterfly: Capabilities for an Integrated Digital and Sustainability Transformation. *Business & Information Systems Engineering*, 1-17.

Further Reading - 2

- Capabilities for an Integrated Digital and Sustainability Transformation. *Business & Information Systems Engineering*, 1-17.
- Gigauri, I., Palazzo, M., & Ferri, M. A. (Eds.). (2023). *Handbook of Research on Achieving Sustainable Development Goals With Sustainable Marketing*. IGI Global.
- Gordon, R., Carrigan, M., & Hastings, G. (2011). A framework for sustainable marketing. *Marketing theory*, 11(2), 143-163.
- Kürpick, C., Kühn, A., Olszewski, L., & Dumitrescu, R. (2023, April). Framework for Dual Transformation: A Systematic Literature Review on the Interplays between Digitalization and Sustainability
- Alkhatib, S., Kecskés, P., & Keller, V. (2023). Green marketing in the digital age: A systematic literature review. *Sustainability*, 15(16), 12369.

Strategies that can help sustainable digital marketing

1 of 4

- **Alkhatib et al. 2023**

- Building a measurement and assessment system for digitalization.
- proposed a model for developing sustainable digitized sales, marketing and services
- recommended using social media and platforms such as LinkedIn for display advertising
- mentions the benefits of advertising through high (not low) sociality green newsfeed advertisements and the importance of consumers' green involvement
- suggested using modern information and communication technology to intensify the process of ecological marketing
- mentioned the importance of smart packaging, smart equipment, predictive social media, and customer relationship management
- explained that corporations must identify the most appropriate social media platforms for their enterprises and develop additional ways to inspire individuals to participate in and contribute to the sustainability of the environment
- business models must be capable of generating strategies that account for the ever-changing environment of digital media
- mentioned that companies must make it apparent that their products are environmentally friendly as most consumers will not read the labels on these products
- adopt an omnichannel strategy, employ diverse combinations of marketing communication channels, and identify causal relationships among relevant quality criteria

Strategies that can help sustainable digital marketing

2 of 4

- **Alkhatib et al. 2023:**

- Customer strive for an optimal balance between price and quality (Alkhatib et al. 2023).
- Websites include both firm-initiated and customer-generated green information to influence overall attitudes and behavioral intentions.
- Suppliers should not underestimate the importance of their sales team in driving success (Alkhatib et al. 2023).

- **Aydin et al. 2023**

- The objective of green marketing should not be the creation of additional consuming regions, but rather the optimal utilization of finite natural resources (Grand 2008). Aydin et al. 2023.
- The mobilization of consumers, public and commercial organizations, and non-governmental organizations (NGOs) is crucial for the effective implementation of green marketing strategies, since it necessitates the distribution of responsibilities among these stakeholders (Grand 2008).
- Promote the use of eco-friendly products and foster consciousness regarding recycling practices (Grand 2008).
- Reduce energy usage rather than relying on throwaway items (Grand 2008).
- It is important for sustainable marketing strategies that AI influences customer behaviors as well as business models, sales processes, and customer service options.
- Using AI and extensive data to influence client preferences and lifestyle decisions in a manner that is characterized by heightened intelligence and environmental sustainability.
- Moreover, it possesses the capacity to function as a burgeoning prospect for enticing a particular demographic of clientele and facilitating the dissemination of tailor-made encounters for those who have a keen interest in actively participating in eco-conscious endeavors.
- Machine learning algorithms have the capability to offer valuable information about client preferences pertaining to sustainable products, while AI has the potential to automate green production processes.

Strategies that can help sustainable digital marketing

3 of 4

• **Fatimi 2024**

- Throughout each layer of system architecture, sustainability principles guide decision-making. From selecting eco-friendly materials and processes in the physical layer to prioritizing low-impact marketing channels and messages, the model embeds sustainability at every step.
- Overcoming challenges of applying digital twins to marketing, require a multi-faceted approach that addresses both technical and organizational hurdles:
 - Enhance data processing capabilities through the adoption of edge computing can significantly reduce latency, ensuring that the DTs can operate in near real-time with the physical world. This decentralizes data processing, allowing for quicker response times and more immediate synchronization between the DT and the physical counterpart.
 - Adopting standardized protocols and frameworks for IoT and DT integration can streamline communication and interoperability between different systems and components. This facilitates smoother data exchange and system coordination.
 - Investing in scalable cloud infrastructure helps adaptation to varying demands of DTs, accommodating fluctuations in data volume and computational needs without compromising performance. Cloud solutions also offer the advantage of advanced security features.
 - Foster interdisciplinary collaboration through cross-functional teams to bridge the gap between technical challenges and marketing objectives.
 - Continuous learning and training for staff in emerging technologies and sustainability practices can empower teams to effectively use DTs.
 - Engage in industry partnerships and collaborative research initiatives to develop the best practices and standards for DTs in marketing.

Strategies that can help sustainable digital marketing

4 of 4

- **Dimitriu et al. 2019**

- New strategies to sales and marketing are necessary based on the key principles of content marketing including knowledge sharing, building confidence and creating value
- Growth in consumer power by digital era, and thus marketing is moving to not just simply be on demand, or always available, but always relevant, responding precisely to the consumer's need. Consumers expect brands to conform to their desires and needs, not vice versa.
- Emergence of Generation C (the constantly connected generation). Not just adolescents or young people but extends to elder categories as well. The brand has become the customer's experience, as such experiences are widely shared online. Therefore, the center of power moves from brands into customers' hands, as classical marketing and sales advertising strategies are no longer always that effective by comparison with peer reviews for instance, which tend to enjoy a much bigger level of confidence.
- Permanently connected clients expect their responses to different customer service issues to be resolved as fast and efficient as possible, maybe even in real time. Talking with customers instead of at customers is becoming the new vision.

Thank you for your time

Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.

Copyright © 2024 Digital4Sustainability. The resources contained herein are publicly available under the Creative Commons license 4.0 B.Y.



Co-funded by
the European Union