CHANGE2TWIN

A DIGITAL TWIN TOOLKIT for (E)DIHs and REGIONS

KEY INSIGHTS & PRACTICAL RESOURCES CHANGE2TWIN PROJECT 2020 - 2024

HORIZON 2020

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WHAT CAN THE DIGITAL TWIN TOOLKIT DO FOR YOU?

Welcome to the Digital Twin Toolkit for Regions and (European) Digital Innovation Hubs (EDIHs), brought to you by the Change2Twin Project. Designed to supercharge your knowledge about Digital Twins and compliment your communication strategy, **this toolkit is packed with resources to help you effectively implement Digital Twins** and spread the word about this transformative technology within your ecosystem.

WHY USE THIS TOOLKIT?

- **Unlock the power of Digital Twins:** Discover how digital twin technology can revolutionize manufacturing processes by simulating and optimizing them in a virtual environment.

- **Gain a competitive edge:** Learn how digital twin solutions can help manufacturing companies enhance product quality, cut costs, and streamline processes.

- **Receive expert support:** Access comprehensive support and guidance throughout your digitalisation journey—from initial assessment to full-scale implementation.

- **Foster innovation through collaboration:** Benefit from facilitated collaboration and knowledge exchange among stakeholders, driving digital transformation and innovation in the manufacturing sector.

WHAT'S INSIDE?

This toolkit provides all the essential content and tools you need for effective understanding and implementation of Digital Twins as well as the dissemination of the Change2Twin project resources, tailored for various audiences.

Key Messages:
Essential information to communicate the benefits of digital twin technology and the support offered by the Change2Twin project.

Audience-Specific Content:
Resources designed for manufacturing companies, (European) Digital Innovation Hubs (EDIHs), and regional authorities.

WHO SHOULD USE THIS TOOLKIT?

- **Manufacturing Companies:** Whether you're a small, medium, or large enterprise, explore how digital twin technology can enhance your production processes and drive innovation.

- **(European) Digital Innovation Hubs (EDIHs):** Access valuable tools to support your services and drive digitalisation in your region.

- **Regional Authorities:** Discover resources to promote economic growth and innovation within your region by leveraging digital twin technology.

Dive in to explore how the Digital Twin Toolkit can empower you to drive industrial transformation and economic growth across Europe!

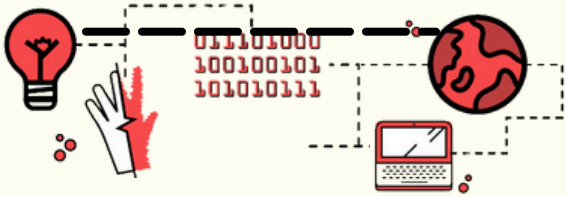
A FEW WORDS OF INTRODUCTION

About the Change2Twin Project

Change2Twin is a European project aimed at boosting the digitalisation of European manufacturing through the adoption of digital twins. Led by a consortium of partners across Europe, **Change2Twin provides support to manufacturing companies** in implementing digital twin solutions to improve their production processes, enhance efficiency, and stay competitive in the global market.

The concept of Digital Twin is one of the **big game-changers** in manufacturing and allows companies to increase their global competitiveness significantly.

The project consortium comprises 18 European companies, including 9 SMEs, three mid-sized companies, a university, a supercomputing centre, two research and technology organisations (RTOs), and two associations. Find out more about us at https://www.change2twin.eu/consortium/



Change2Twin's overarching ambition is to democratise access to the necessary technologies for deploying a digital twin, ensuring that all European manufacturing companies benefit from this innovation.

The Change2Twin project offered European manufacturing SMEs and midcaps (companies with up to 3.000 employees) funding to get ready and create a digital twin. For this purpose, Change2Twin organised two rounds of open calls where companies could apply for funding. The first batch of open calls took place in 2021, and the last round ended in 2023.

In each open call, Change2Twin offered two different instruments:

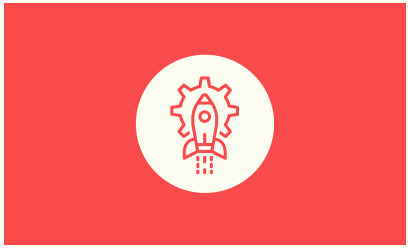
- Assessment voucher (up to € 10.000 / project) via Assessment Open Call
- Deployment voucher (up to € 90.000 / project) via Deployment Open Call

Assessment Voucher

The Assessment Voucher was one of two financial instruments offered by Change2Twin to manufacturing SMEs to enhance their digitalisation efforts and implement a digital twin. It was a non-refundable grant awarded competitively, with a maximum amount of €10,000 provided as a lump sum. The Assessment Voucher covered the expenses associated with a comprehensive evaluation of the company's digitalisation status and its readiness for adopting a digital twin. This evaluation was complemented by three tailored strategies for creating and deploying a digital twin based on the beneficiary's specific needs. These strategies could serve as the foundation for applying for the second financial instrument, the Deployment Voucher. The evaluation and strategies adhered to the Change2Twin methodology and were conducted by certified Digital Innovation Hubs (DIHs).

Deployment Voucher

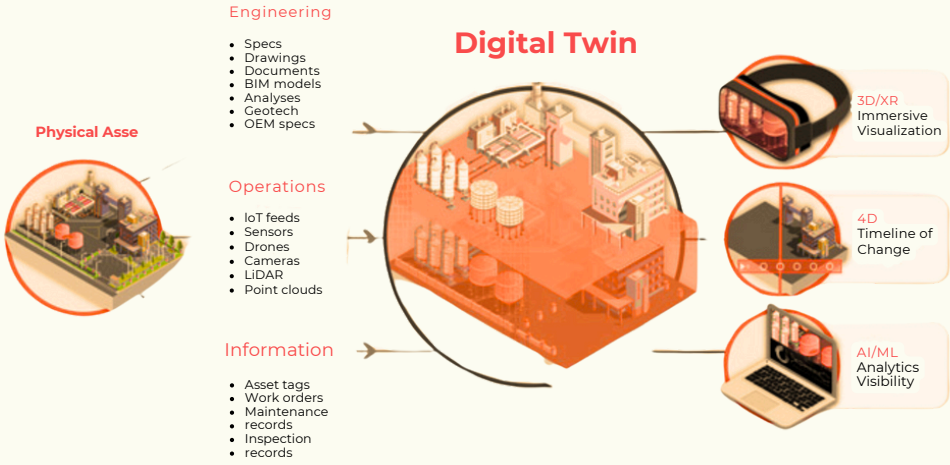
The Deployment Voucher was the second funding scheme offered by Change2Twin. It aimed to assist manufacturing companies in developing and deploying their initial digital twin. Each company could receive a maximum non-refundable grant of up to €90,000. The Deployment Voucher included an 11-month support program for beneficiaries. This program involved technical mentoring to aid in the deployment of the digital twin across all phases, from defining requirements to designing user specifications. Beneficiaries also received guidance on selecting appropriate technologies and standards for their digital twin implementation. After their projects, beneficiaries submitted final reports detailing their outcomes.



What is a Digital Twin and how can it benefit your business?

> **A digital twin is a digital replica of an artefact (product, machine, etc.), process, or service that is so accurate that it can be used as the basis for making decisions. Streams of data often connect the digital replica and the physical world.**

For businesses, especially Small and Medium Enterprises (SMEs), this technology can drive significant value by optimizing processes, reducing costs, and improving decision-making. However, the implementation of Digital Twin solutions can be complex and costly. The Change2Twin project aims to address these challenges by providing practical tools and strategies to help SMEs overcome barriers and effectively integrate Digital Twin technology into their operations.



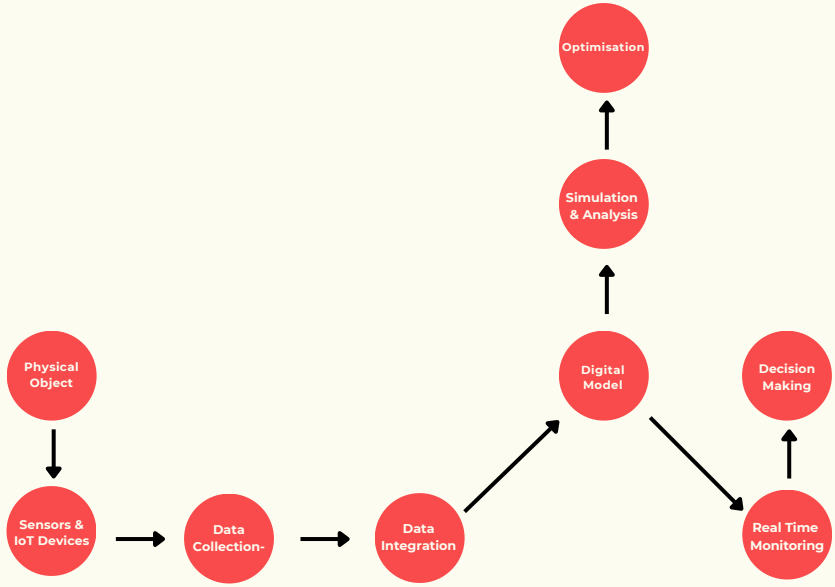
Source: AEC Magazine - https://aecmag.com/features/discussing-digital-twins/

Components of a Digital Twin

1. Definition and Purpose

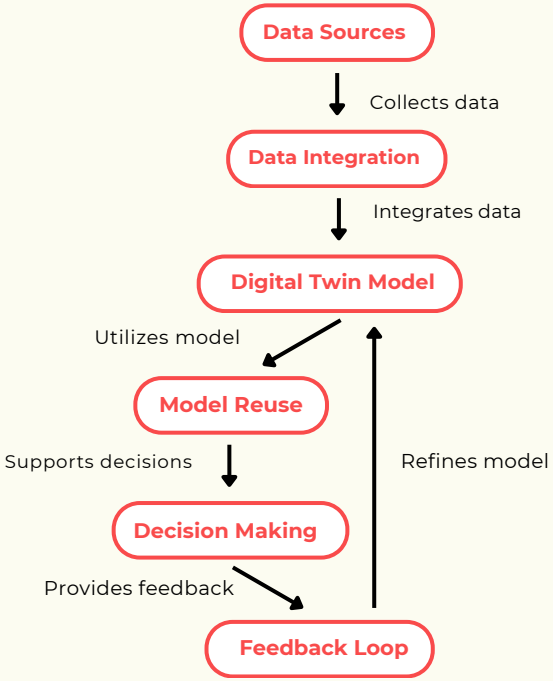
- **Fit for Purpose:** The Digital Twin must be precise enough for decision-making and adaptable for multiple purposes.
- **Interoperability:** Components and platforms should work seamlessly with other solutions and across the product lifecycle.

Concept of a Digital Twin



2. Technological Requirements

- **Data Integration:** Use open standards like ISO 10303 for data exchange and interoperability.
- **Reuse of Models:** Ensure models can be utilized for various applications, reducing redundancy and increasing efficiency.



Flowchart illustrating data integration and model reuse strategies

3. Supporting Technologies

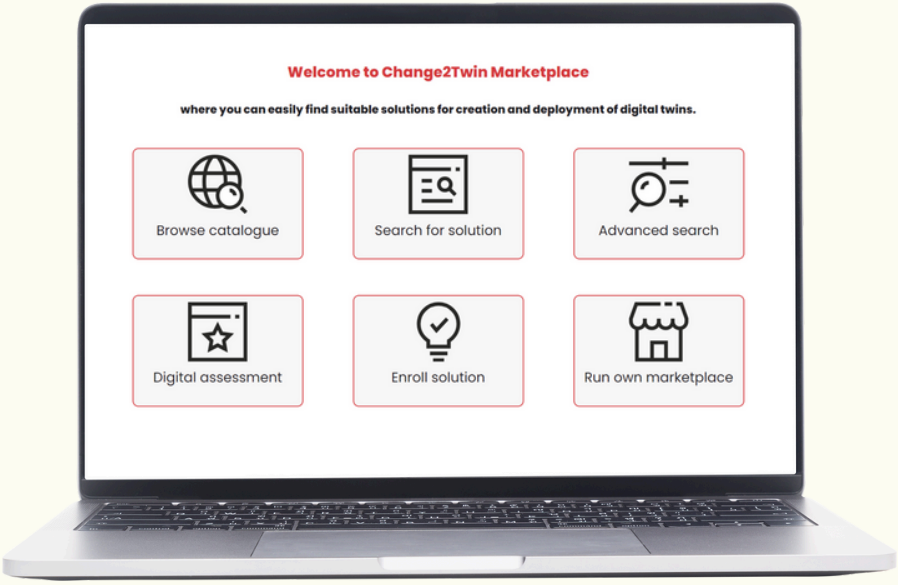
- **Internet of Things (IoT):** Essential for gathering real-time data from physical assets, enabling accurate digital representations.
- **Artificial Intelligence (AI) and Machine Learning:** These technologies enhance the predictive capabilities of digital twins by analyzing data patterns and improving decision-making processes.
- **Mixed Reality (MR):** Combines physical and digital worlds, allowing users to interact with digital twins in immersive environments, which can improve training and operational efficiency.

FRAMEWORKS AND KEY RESOURCES OF CHANGE2TWIN

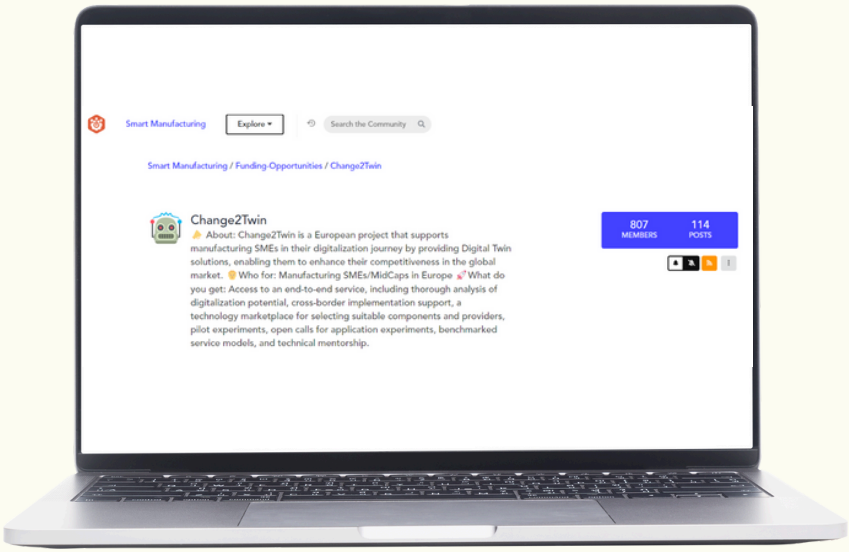
Overview of the Change2Twin outcomes

Change2Twin is a dynamic collaborative initiative bringing together a wide range of partners. Their **combined efforts have resulted in a rich repository of knowledge, practical experience, and cutting-edge tools and methodologies** that can serve as essential tools for (E)DIHs in supporting SMEs. These achievements encompass:

1. Marketplace infrastructure:
Developed a digital platform where (E)DIHs, solution providers, and stakeholders connect, collaborate, and access resources related to digital twin technology and its implementation.



2. Community platform:
Developed an online platform fostering interaction among SMEs, MidCaps, (E)DIHs, and technology providers, facilitating knowledge sharing and collaboration in digital twin adoption.



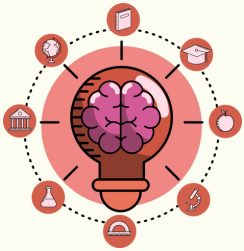
3. Assessment tools (compass, readiness and 7 steps):
Developed tools used by DIHs to assess SMEs' readiness and guide them through the process of adopting digital twin technology, covering comprehensive steps and readiness evaluation.

4. Knowledge of Digital Twins (DT):

- Information and insights gathered on digital twin technology, tailored for (E)DIHs and SME adopters to inspire and inform their digital transformation efforts.
- Established expertise in digital twin technologies among (E)DIHs, continually developed through collaborative efforts and shared within the EDIH Working Group.

5. Knowledge of SME needs:

Research and documentation focusing on the specific needs of SMEs in adopting digital twin technology, aimed at policymakers and DIHs to tailor support programs accordingly.



6. Position papers, brochures (PDF):

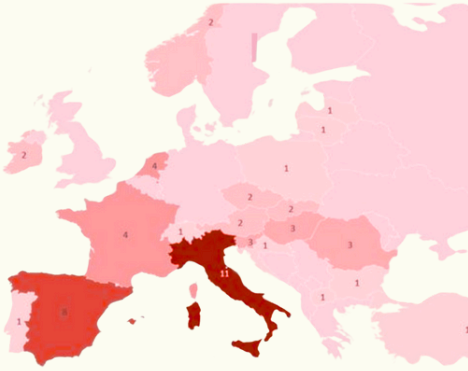
- Developed documents providing detailed information and guidance on various aspects of digital twin adoption, distributed in electronic format to DIHs and SMEs.
- Comprehensive documents discussing barriers, standards, and other pertinent topics related to digital twin implementation, and continuing development to inform stakeholders..

7. Training:

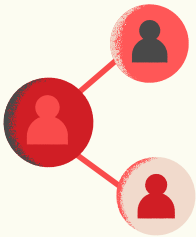
Developed training materials and certification processes designed to educate (E)DIHs on digital twin technologies and equip them with practical implementation skills.

8. Community of DT certified (E)DIHs (55 DIHs, 23 countries):

Network of DIHs certified in digital twin technologies across 23 countries, fostering collaboration, knowledge exchange, and best practices in digital twin adoption.

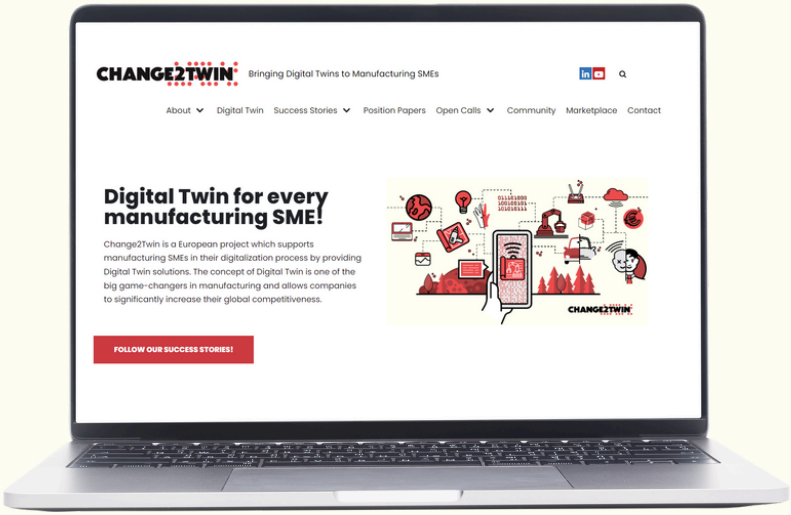


9. LinkedIn channel with 1,100+ followers:
Established a LinkedIn channel with a substantial following, used to disseminate updates, and insights, and foster discussions among (E)DIHs interested in digital twin technologies.



10. YouTube channel with tech talks, videos from beneficiaries, tutorials…:
YouTube channel featuring tech talks, beneficiary testimonials, and tutorials related to digital twin technologies, serving as an educational resource for (E)DIHs and SMEs.

11. Change2Twin website:
Developed a website serving as a central hub for project information, resources, and updates related to digital twin adoption for (E)DIHs and stakeholders.

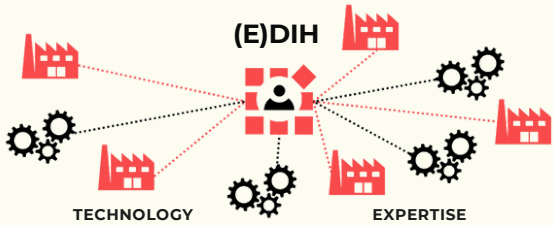


12. Change2Twin Digital Agora:

- A B2B cloud-based platform that seeks to streamline the access to and adoption of ICT technologies and solutions, thanks to its dedicated functionalities to support Community interactions, Marketplace services, and Enterprise resources around ICT-driven solutions.
- The Community of the Digital Agora aims to empower its members to share and interact with one another and to benefit from the collective intelligence of other participating manufacturers and experts.
- Open environment for (E)DIHs to support manufacturing SMEs in:
  - -upskilling their staff
  - -digitalising their production
  - -getting connected to experts to address their individual challenges

13. Established position in the (E)DIH ecosystem as DT-focused DIH network:

Ongoing effort to establish and maintain a prominent role within the (E)DIH ecosystem, focusing on digital twin technologies and fostering collaborative initiatives.

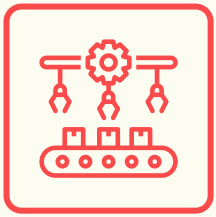


These assets contribute to the broader objective of advancing digital twin adoption, enhancing collaboration among stakeholders, and fostering innovation within the manufacturing sector.

Address challenges in DT implementation with Change2Twin

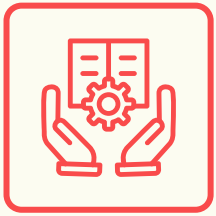
Digital Twin technology is at the forefront of digitalisation, offering immense potential across various applications. However, **achieving viable Digital Twin solutions that provide the expected benefits requires overcoming several organisational and technological challenges.** This is particularly difficult for small and medium-sized enterprises (SMEs) due to the high costs and time commitments involved in developing, using, and maintaining these solutions.

Experts from the Change2Twin consortium have thoroughly analysed and identified nine key barriers, focusing on both organisational and technological aspects. Through the H2020 Change2Twin project, they have developed specific tools and techniques to help manufacturing SMEs overcome these obstacles. Although no single solution can address all challenges, the consortium, in collaboration with Digital Innovation Hubs (EDIHs) across Europe, offers comprehensive solutions that tackle the entire range of identified barriers.



For a detailed exploration of these challenges and solutions, the position paper "Overcoming 9 Digital Twin Barriers for Manufacturing SMEs" provides valuable insights. **This document is essential for (E)DIHs and SMEs that see Digital Twin technology as a critical solution for delivering value and achieving significant business impacts.** The Change2Twin marketplace further facilitates this process by providing easy access to technological solutions for all interested parties.

By utilizing the resources and support offered by Change2Twin, SMEs can successfully navigate the complexities of Digital Twin implementation and harness the transformative power of this advanced technology.



Make use of the Assessment tools

There are many different digitalisation solutions available on the market, and Digital Twinning is just one of them. SMEs are often focused on their daily operations and lack the time to explore all the available options. To invest in digitalisation, however, SMEs need to understand how these solutions will benefit their business.

The Change2Twin project aims to support companies in finding solutions tailored to their specific business needs and ambitions. To this end, the Change2Twin assessment team has developed a method for evaluating the digital preparedness of SMEs. The assessment explores the SME's ambitions and evaluates whether and how Digital Twinning can help the company achieve them.

The Change2Twin assessment consists of two parts: a Digital Transformation assessment and a Readiness assessment. It starts with understanding the SME's current situation and future business ambitions. **The Digital Transformation assessment links the business needs to digital transformation pathways and indicates the relevance of Digital Twinning as a solution.** If applicable, the most relevant Digital Twinning purposes are identified, which serve as input for the Readiness assessment. The SME can then determine the technical and organisational changes needed for the specific Digital Twin to become functional.

The assessment method is supported by two tools, the Compass and Readiness tools, designed to help (E)DIHs with the assessment process. These tools provide consultants with guidelines to ensure all important aspects of the analysis are covered. **The assessment gives a comprehensive understanding of the client's situation and challenges before devising a technical solution.** This makes the assessment process more efficient and helps SMEs make informed investment choices in digital technology.

Compass Tool

The first step (Digitalisation Assessment - COMPASS TOOL) is to clearly state WHY an SME is considering digitalisation and Digital Twinning. There are many different digitalisation solutions available. Digital Twinning is only one of them. Step one is supported by a tool that uses several inputs from the SME and results in a ranking of digitalisation options, and the relevance of Digital Twinning.

Readiness Tool

If Digital Twinning relevance is medium/high, the SME can continue with Step two: the digital twinning readiness assessment (READINESS TOOL). This is a second tool that provides the SME with insights into its readiness and desired levels and thus leads to clear steps that need to be taken to reach the desired state. With the outcome of both tools, the DIH can then advise the SME on technology choices and create the recipes. With the outcome from both stages, the DIH can advise you about possible technology choices and create the recipes.

Digitalisation Assessment

The Change2Twin assessment begins by evaluating the SME's digitalisation status in alignment with its strategy. Digital Innovation Hubs (DIHs) initially grasp the SME's current situation and future business aspirations. The evaluation primarily relies on the Key Performance Indicators (KPIs) the SME aims to enhance. Subsequently, the assessment correlates business requirements with pertinent digital transformations, highlighting the suitability of digital twinning as a targeted solution for achieving business goals.

If digital twinning appears moderately or highly relevant, the SME is encouraged to proceed to the second assessment stage to gauge the business's preparedness for digital twinning implementation.
Conversely, if digital twinning's relevance is deemed low, the SME is advised to prioritize other aspects of digitalisation within their business. In such cases, the DIH assists the SME in exploring alternative and more applicable digitalisation opportunities.

For more details about the Compass Tool, please consult the Document "Definition of Assessment Steps and Guidelines". There, in section 4.1 you will also find a (fictive) case study.

Readiness Assessment

Once the initial phase affirming the relevance of digital twin technology for the company is completed, the assessment of digital twinning readiness can commence. This Readiness Assessment aims to delve deeper into the SME's preparedness for a specific digital twinning objective identified in the initial phase.

During this stage, another tool called the Change2Twin Readiness Tool is utilized to facilitate discussions between the DIH and the SME. This tool employs the "7-steps method" developed by ESI/TNO to pinpoint readiness gaps between the current state and the company's aspirations concerning the most pertinent digital twinning purpose.

For more details about the Digital Twinning Readiness Tool, please consult the Document "Definition of Assessment Steps and Guidelines". Here in section 5.1 you will also find a (fictive) case study.

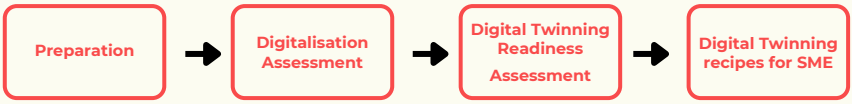
Explore the 7 essential steps to DT

The process of establishing a digital twin relies on the "7 Steps to Digital Twins" which presents a structured method for integrating digital twinning into an organisation. These steps generally delineate the procedure for developing a digital twin, representing a virtual rendition of a tangible object or system.

Assessment helps deciding | **Assessment helps making a recipe for**

1	2	3	4	5	6	7
Start with WHY	Asset Selection	Infrastructure	Twin Building	Live Operation	Business Action	Cradle to Grave

The first step is to clearly state WHY an SME is considering digitalisation and Digital Twinning. **There are many different digitalisation solutions available. Digital Twinning is only one of them.** Step one is supported by a tool which uses several inputs from the SME and results in a ranking of digitalisation options, and the relevance of Digital Twinning. In case of Digital Twinning relevance is medium/high, the SME can continue with Step two: the digital twinning readiness assessment. This is a second tool that provides the SME with insights into its readiness and desired levels and thus leads to clear steps that need to be taken to reach the desired state. With the outcome of both tools, the DIH can then advice the SME on technology choices and create the recipes.



In summary, the following steps are:

1 

Define Objectives: Clearly articulate the goals and objectives of implementing digital twinning within the organisation. This involves identifying what aspects of the physical system or object need to be replicated digitally and what outcomes are expected from the digital twin.

2 

Collect Data: Gather relevant data from the physical system or object that will be used to create the digital twin. This may include sensor data, operational data, design specifications, historical data, etc.

3 

Create Model: Develop a digital model based on the collected data. This model should accurately represent the physical system or object in a virtual environment. Depending on the complexity of the system, this may involve various modeling techniques such as 3D modeling, mathematical modeling, simulation, etc.

4 

Integrate Data Sources: Integrate data streams from various sources into the digital twin model. This may involve connecting sensors, IoT devices, databases, and other data sources to ensure that the digital twin remains synchronized with the physical system in real-time.

5

Validate and Test: Validate the accuracy and functionality of the digital twin through testing and simulation. This step involves comparing the behavior of the digital twin with the actual physical system under different conditions to ensure that it behaves as expected.

6

Deploy and Monitor: Deploy the digital twin into operational use and continuously monitor its performance. This may involve monitoring key performance indicators (KPIs), analyzing data generated by the digital twin, and making adjustments as necessary to improve its accuracy and effectiveness.

7

Iterate and Improve: Continuously iterate and improve the digital twin based on feedback from real-world usage and changing requirements. This may involve updating the model, integrating new data sources, refining algorithms, and incorporating advancements in technology to enhance the capabilities of the digital twin over time.

By following these 7 steps, organisations can effectively implement digital twinning to gain insights, optimise operations, and make informed decisions based on real-time data and simulations of physical systems or objects.

Learn more about the technologies available for DT

Digital twins inherently have a broad scope, encompassing a wide range of technologies from traditional computer-aided (CAx) systems to advanced computing hardware, as well as emerging technologies such as the Industrial Internet of Things (IIoT) and deep learning. **For SMEs to fully leverage their digital twin implementations, it is crucial that these technologies are accessible and presented in a way that is understandable and relevant to their business operations.** One of the main obstacles to adopting digital twins in industry is the lack of understanding of the potential offered by the latest technological advancements.

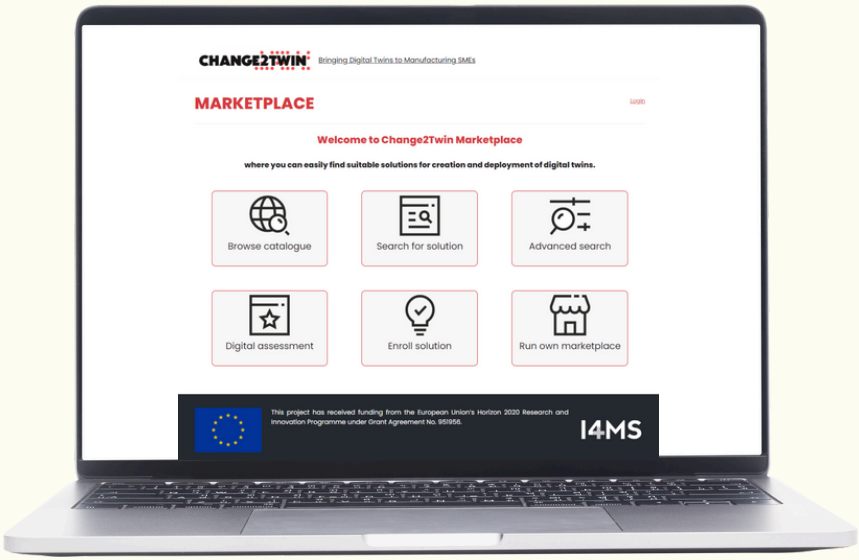
As part of the Change2Twin project, a position paper titled "Enabling technologies for digital twins in manufacturing" has been developed to provide simple and concise introductions to a wide range of technologies important for digital twin implementations. Key categories encompass:

- Geometric and physics-based modeling
- Data-driven modeling and big data cybernetics
- Infrastructure and platforms
- Human-machine interface
- Data management

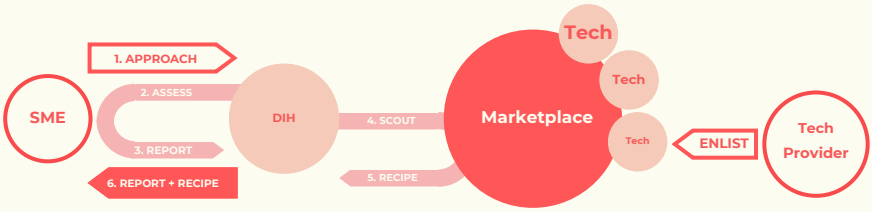
It's important to recognize that digital twin implementations are continuously evolving and may incorporate additional technologies in the future, particularly as emerging technologies mature and enter the market.
It also discusses how technology taxonomies will aid in making technologies accessible and discoverable for European Digital Innovation Hubs (DIHs) and SMEs. The initial version of the Change2Twin marketplace is highlighted as a platform for users to search for and discover technologies, and how this marketplace is evolving to more comprehensively meet changing needs.

CREATE YOUR MARKETPLACE WITH CHANGE2TWIN

The Change2Twin Marketplace serves as a digital platform where manufacturing companies, Digital Innovation Hubs (DIHs), and other stakeholders can connect, collaborate, and access resources dedicated to digital twin technology and its implementation. **It showcases solutions from European technology providers aimed at facilitating the development and deployment of digital twins.** Designed as a tool for European Digital Innovation Hubs supporting manufacturers in their digital transformation journey, the Marketplace fosters innovation and collaboration across the industry.



A fundamental aspect of the Change2Twin approach is to provide access to enabling technologies for digital twinning through an online marketplace. This marketplace offers a variety of items, including consulting services, informational resources, software, hardware, and complete digital twin solutions. The diagram below illustrates the initial concept of the end-to-end service provided by a Digital Innovation Hub (DIH) to small and medium-sized enterprises (SMEs) using the marketplace to access enabling technologies. It further illustrates the involvement of technology providers in making these enabling technologies accessible through the marketplace, as well as outlines the straightforward steps for effectively supporting SMEs.



The participants in this scenario are the SME, the DIH, the marketplace and technology provider. **The main entry point into this scenario is where the SME approaches the DIH for support**. From the perspective of the DIH, the steps are as follows:

1. The DIH is approached by the SME for support.
2. The DIH assesses the situation of the SME, with the SME. This can be done, for example, by completing the Change2Twin COMPASS assessment and readiness tools.
3. The DIH and SME complete the report as to which digital twinning purposes are most suitable for the SMEs, with an instruction and agreement as to which should be pursued.
4. The DIH assists the SME by scouting the marketplace in search of enabling technologies
5. suitable for the selected purposes.
   The enabling technologies are provided as a recipe to the DIH by the marketplace.
6. The DIH provides the matching recipe to the report with recommendations of enabling technologies, the associated technology providers, and information about developing and implementing a workable digital twin for their designated purpose.

Simultaneously, technology providers can register their enabling technologies in the marketplace, making them discoverable by DIHs and accessible to SMEs. It is essential that the information about these technologies remains current, particularly concerning updates, revisions, or changes in contact and operational details. The Change2Twin marketplace initially served as a platform for sharing the technologies developed by the Change2Twin consortium, but it now includes numerous listings from external parties and continues to expand daily.

Overview of the Marketplace:

Resource Repository: The marketplace offers a repository of resources, including case studies, best practices, toolkits, and guidelines related to digital twin technology and its application in manufacturing.

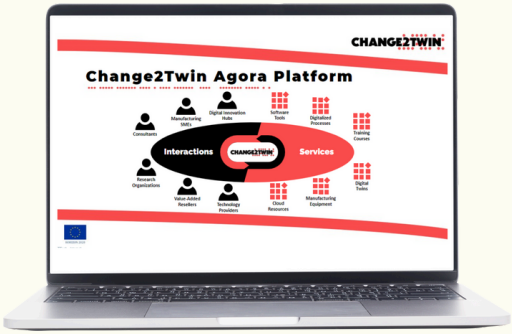
Project Partners: It provides information about project partners, their expertise, and the services they offer, allowing manufacturing companies to identify potential collaborators and service providers for their digitalisation projects.

DIHs and Expertise: The marketplace features profiles of DIHs and experts involved in the Change2Twin project, showcasing their capabilities, services, and areas of specialization in digital twin technology and manufacturing.

Networking Opportunities: Manufacturing companies can use the marketplace to network with other companies, DIHs, and experts interested in digital twin technology, fostering collaboration, knowledge exchange, and partnership development.

Training and Events: The marketplace lists upcoming training sessions, workshops, webinars, and events related to digital twin technology and manufacturing, providing opportunities for stakeholders to enhance their knowledge and skills.

The Change2Twin Agora Platform streamlines the access and adoption of digital twinning solutions and enables dedicated functionalities to foster community interactions, marketplace services, and enterprise resources for the manufacturing industry.



Advantages for Regions

Ecosystem Development: The marketplace contributes to developing a vibrant digital innovation ecosystem within the region by connecting manufacturing companies, DIHs, research institutions, and other stakeholders.

Promotion of Regional Expertise: Regions can showcase their expertise, capabilities, and services related to digital twin technology through profiles on the marketplace, attracting potential collaborators and investment.

Access to Resources: Regions can leverage the marketplace's resource repository to access case studies, best practices, and guidelines, supporting the digitalisation efforts of local manufacturing companies and DIHs.

Networking and Collaboration: The marketplace facilitates networking and collaboration opportunities for regional stakeholders, fostering partnerships, knowledge exchange, and innovation.

Advantages for (E)DIHs:

Visibility and Promotion: DIHs can raise their visibility and promote their services and expertise in digital twin technology to a broader audience of manufacturing companies and stakeholders through profiles on the marketplace.

Partnership Opportunities: The marketplace enables DIHs to identify potential partners, collaborators, and clients for their digitalisation services, leading to new business opportunities and partnerships.

Access to Resources: DIHs can access resources, tools, and guidelines available on the marketplace to support their digitalisation initiatives and provide value-added services to manufacturing companies.

Networking and Knowledge Exchange: DIHs can network with other DIHs, experts, and stakeholders in the digital twin ecosystem, facilitating knowledge exchange, collaboration, and capacity building.

In summary, the Change2Twin Marketplace is a valuable platform for connecting stakeholders, accessing resources, and fostering collaboration in digital twin technology. It benefits both regions and European Digital Innovation Hubs (DIHs) involved in the project.

LEARN FROM OUR USE CASES AND SUCCESS STORIES

The Change2Twin project has **allocated nearly €2.5 million to 50 beneficiaries across Europe** for their digital twin implementation projects (through Assessment and Deployment Vouchers). These beneficiaries represent diverse industries such as automotive, chemicals, transport, textiles, electrical, and metals. What unites them is that adopting digital twins has significantly enhanced their business development, competitiveness, innovation, and resource management capabilities.

Allow us to introduce some of the Change2Twin champions:

DNAPhone Srl from Italy

DNAPhone is an innovative Italian company that develops diagnostic systems for quality controls in the Food&Beverage sectors. Smart Analysis is the main product dedicated to small and medium-sized wineries and breweries who want to improve their quality control in a simple way, without the need for specialised personnel or dedicated laboratories.

DNA Phone applied and succeeded in the subsequent Deployment Open Call. Assessment done by DIH SMILE. The main purpose of the digital twin in DNAPhone's project was the optimisation and best quality of the product and of the production line, optimising the operational and managerial parts. The project included a simulation of the behaviour of devices to characterise them and choose the best optical or electronic one to improve product performance.

Pressious Arvanitidis S.A. from Greece

Pressious Arvanitidis is the largest graphic design and offset printing company in Greece, maintaining a list of over 800 businesses as active clients across Europe and is awarded for innovative printing products and designs (Environmental Awards 2013, Packaging Innovation Awards 2017). Its printing factory is located close to Athens and currently executes more than 10,000 printing orders per year. Currently, it has 100 employees in 12 different departments. Pressious adopted the digital twin technology to optimise production and minimise environmental footprint. They mapped all processes to digital ones, which allowed them to run them in a safe environment with minimal cost. This project allowed them to optimise orders and production by configuring the machines through the digital twin.

Beneficiary testimonial:

"It was the first digital twin implementation for our company and the results were very, very interesting. So I have already recommended other colleagues, in other SMEs, to try their own digital twin. "

Chris Trochoutsos, Pressious Arvanitidis, Greece

Neutroplast - Indústria de embalagens Plásticas S.A. from Portugal

Neutroplast is an SME that offers primary packaging and medical devices within the pharmaceutical, cosmetic and healthcare sectors. With a consolidated experience of 28 years, there is a constant pursuit of innovation and new techniques that guarantee the improvement of solutions for packaging. The project aimed to create a digital twin application for an industrial process to enhance overall performance. The digital twin application served as a foundation for disseminating the solution to all processes and technologies at Neutroplast, increasing expertise in core competences and moving towards the goal of zero-defects.

Beneficiary testimonial:

"This pilot was an amazing experience and we are glad that. we could translate all the work and results to the jury in a way that was possible to evaluate."

Tânia Simões, Neutroplast, Portugal

Marovt d.o.o. from Slovenia

Marovt is a company whose main focus is on forging, machining of forged parts and the production of turning parts for the most prestige leading trademarks in the automotive industry. Marovt applied and succeeded in the subsequent Deployment Open Call. Assessment done by DIH Slovenia.

DB Biotech, a.s. from Slovakia

DB Biotech is a producer of antibodies mainly used for clinical diagnostics of cancer in early stages and for research purposes. Assessment done by DIH Slovak Centre of Digital Innovations.

Beneficiary testimonial:

"We would like to express our appreciation to the consortium for the opportunity and the lessons learned from this experience. We will take the feedback into consideration as we continue to refine our future proposals and explore other avenues to contribute to the digital twin ecosystem".

Stanislav Hreško PhD, DB Biotech, Slovakia

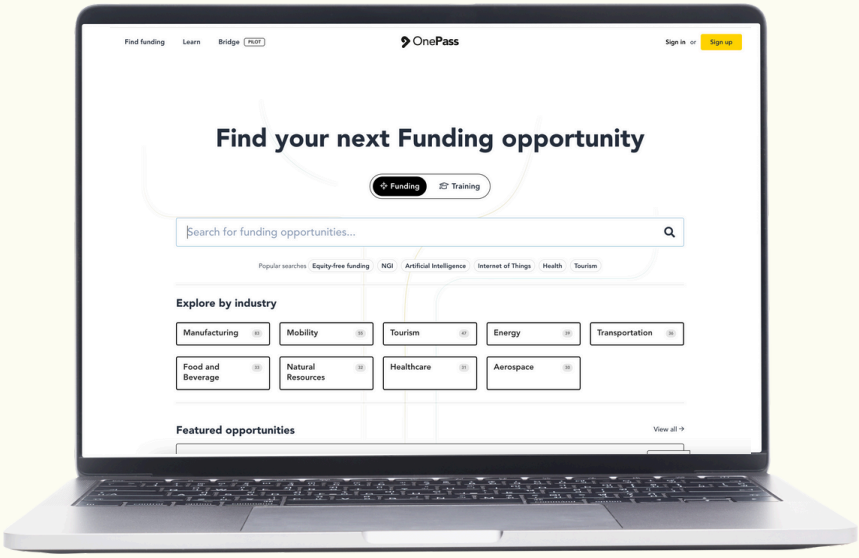
Get to know more about struggles and success of our #digitaltwin champions at our YouTube channel.

(FUNDING) OPPORTUNITIES FOR SMES AND (E)DIHS

In the world of financing, numerous funding opportunities exist, but identifying the ideal match for specific needs and goals can be challenging. However, understanding suitable funding sources is well worth the effort, as it can lead to transformational changes within an organisation.

FundingBox platform - OnePass - caters to the funding requirements of SMEs in the manufacturing industry, providing access to new opportunities. **OnePass enhances early-stage startup investments by offering seamless access to reliable, verifiable information.** It addresses the startup information gap by leveraging verifiable credentials to establish a trusted network for cross-border investments, thereby streamlining deal flows.

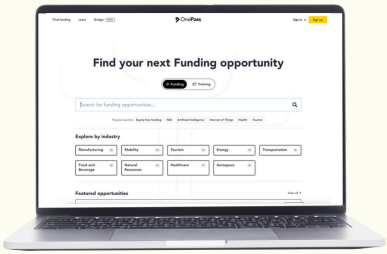
With OnePass HUB, you can access over €780 million in funding opportunities, all centralized in one platform. And that's not all! Our platform also offers top-notch training programs. Another trick up our sleeve! Upskill your team with the best training programs available on OnePass.



Support for SMEs: One Pass for funding

How to Use OnePass

1 Visit One Pass website



2 Understand the Benefits

Learn about the various key stakeholders in our network who are enhancing digital trust:

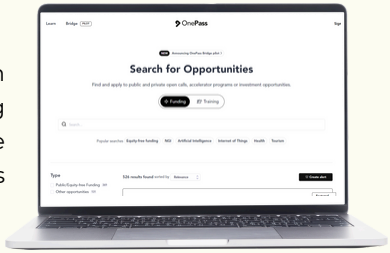
- **Holders** (Startups & SMEs): Get verified to streamline your funding journey with verified credentials, providing access to numerous investment opportunities.
- **Verifiers** (Investors, Grantees & Funds): Effortlessly verify startup information and connect with pre-verified, venture-ready SMEs and startups for investment.
- **Issuers** (Startup Accelerators & Incubators): Join as a "Trusted Issuer" to create a secure framework for cross-border investments.

3 Get Verified

Startups and SMEs can get verified through our platform. This verification process leverages blockchain technology to ensure authenticity and build trust with investors.

4 Access Investment Opportunities

Once verified, startups and SMEs can explore various funding opportunities available on the platform, providing a seamless funding journey.



5 Connect with Stakeholders

Use the platform to connect with investors, grantees, funds, and other key stakeholders who are part of our trusted network.

6 Access Investment Opportunities

- Join as a Trusted Issuer.
- Startup accelerators and incubators can join as "Trusted Issuers" to help shape a secure framework for cross-border investments.

Why Use OnePass

1

Revolutionize Your Funding Journey
OnePass uses verified credentials to streamline the funding process, making it more efficient and trustworthy for startups and SMEs.

2

Harness the Power of Web3
By bringing Web3 technology to EU SME funding, OnePass enhances transparency, security, and efficiency in the funding ecosystem.

3

Boost Digital Trust
Engage with a network of stakeholders committed to boosting digital trust, ensuring reliable and secure funding transactions.

4

Seamless Verification Process
Investors and funds can easily verify startup information, reducing the time and effort required to find and evaluate potential investments.

5

Centralized Access to Opportunities
With over €780 million in funding opportunities available on a centralized platform, OnePass provides a comprehensive resource for finding investment options.

6

Collaborative Ecosystem
Benefit from collaborations with prominent entities like Amazon Web Services (AWS), The Adecco Group, Mylia and Fast Lane Group, which enhance the overall value of the platform.

By following these steps, you can leverage OnePass to streamline your funding journey, access new opportunities, and connect with a trusted network of stakeholders.

Support for (E)DIHs

Additionally, a wide array of services is available for DIHs to support their growth and success. These services encompass various aspects such as mentoring, funding support, networking opportunities, and access to specialized resources tailored to their specific needs and objectives:

1

Strategic Planning and Development, can involve:

- Conducting market analysis and needs assessments.
- Defining long-term goals and objectives.
- Identifying key performance indicators (KPIs) and success metrics.
- Formulating strategies for growth, sustainability, and impact.

2

Funding and Financial Advisory. Financial expertise is crucial for the sustainability and growth of DIHs and can involve:

- Assistance in securing funding from public and private sources.
- Financial planning and budgeting.
- Development of business models and revenue generation strategies.
- Risk management and financial compliance.

3

Innovation Management. To help DIHs stay at the forefront of technological advancement, can involve:

- Guidance on innovation processes and methodologies.
- Support in setting up innovation labs and accelerators.
- Facilitation of ideation workshops and hackathons.
- Implementation of best practices in research and development (R&D).

4

Marketing and Communications. Effective marketing and communication strategies are essential for DIHs to engage with stakeholders and promote their services. It can involve:

- Development of marketing strategies and plans.
- Branding and identity creation.
- Digital marketing and social media management.
- Public relations and media outreach.

5

Training and Capacity Building
It can involve designing and delivering training programs to enhance the skills and capabilities of DIH staff and stakeholders.
Services include:

- Training needs assessment.
- Development and delivery of training modules (technical, business, and soft skills).
- Facilitation of workshops, seminars, and webinars.
- Mentoring and coaching programs.

6

Operational and Process Improvement
Improving operational efficiency and processes can significantly enhance the effectiveness of DIHs.
The services in this area include:

- Process mapping and optimisation.
- Implementation of quality management systems.
- Project management support.
- Development of standard operating procedures (SOPs).

7

Partnership and Ecosystem Development
Building a robust innovation ecosystem is crucial for the success of DIHs. The services in this area include:

- Identifying and engaging potential partners (industry, academia, government, investors).
- Facilitating collaborations and consortia.
- Organizing networking events and forums.
- Building and managing stakeholder relationships.

Subscribe to the FundingBox DIH digest to receive the latest industry news, insightful articles, information on upcoming events, and exciting opportunities, all curated specifically for DIHs.

Stay informed, connect with fellow innovators, and discover new ways to drive your success!

TAKEAWAYS FOR (E)DIHS

Utilize project resources and results

Comprehensive Guidance:

This toolkit provides detailed resources and step-by-step guidance to help you assist SMEs in the implementation of digital twin technologies effectively within your region.

Practical Tools:

A comprehensive repository of practical tools, including assessment instruments and implementation guides, to effectively facilitate the adoption of digital twins.

Collaboration Platforms:

An opportunity to connect with other (E)DIHs and stakeholders through our provided platforms, fostering support and knowledge exchange crucial for successful implementation.

Communicate the benefits of DT to SMEs

Optimisation and Efficiency:

Demonstrate how digital twins can simulate and optimise manufacturing processes, leading to increased efficiency and reduced operational costs.

Quality Improvement:

Highlight how digital twins can improve product design and quality through virtual testing and validation.

Competitive Advantage:

Emphasize the strategic benefits of digital twin technology, helping SMEs gain a competitive edge in the market.

Ongoing Support:

Ensure SMEs understand the continuous support available from initial assessment through full-scale implementation, making their digital transformation process smoother and more manageable.

Make the technology relatable and comprehensible

Success stories

Real-World Impact:
with Change2Twin, European SMEs have successfully implemented digital twin technologies, leading to significant improvements in their operations.

Case Studies:
Case Studies: Detailed case studies illustrate how various companies have utilized digital twins to optimise processes, reduce costs, and enhance product quality. These examples serve as inspiration and provide practical insights into the benefits of digital twin adoption.

Measurable Results:
The documented success stories highlight measurable results such as increased efficiency, reduced downtime, and improved decision-making capabilities, demonstrating the tangible benefits of digital twins.

Showcasing champions of Digital Twins

Industry Leaders:
The project features champions from various sectors who adopted and are now advocating for digital twin technologies. These champions have successfully integrated digital twins into their operations and have seen substantial benefits.

Testimonials:
Testimonials from these champions provide firsthand accounts of the challenges and successes encountered during the implementation process, offering valuable lessons and best practices for others to follow.

Role Models:
These champions act as role models for other SMEs and (E)DIHs, showcasing the potential of digital twins to drive innovation, competitiveness, and growth in the manufacturing sector.

By sharing these success stories and highlighting the champions of digital twin technologies, (E)DIHs can motivate and guide other SMEs in their digital transformation journey. These examples provide concrete evidence of the positive impact digital twins can have and offer practical advice on overcoming common barriers to adoption.

CHANGE2TWIN

Imprint

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