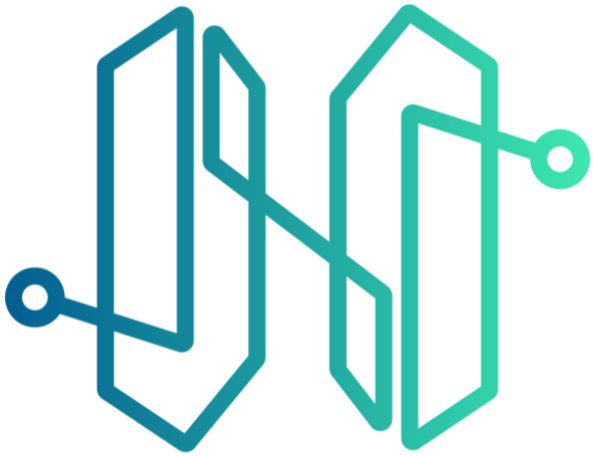

humantech

D8.2 – HT Dissemination & Communication Interim Report

Project Title	Human-Centred Technologies for a Safer and Greener European Construction Industry.
Project Acronym	HumanTech
Grant Agreement No	101058236
Instrument	Research & Innovation Action
Topic	HORIZON-CL4-2021-TWIN-TRANSITION-01-12
Start Date of Project	June 1, 2022
Duration of Project	36 months

Name of the Deliverable	HT Dissemination & Communication Interim Report
Number of the Deliverable	D8.2 (D38)
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Deliverable Due Date	30.11.2023
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Task Leader/Main Author	Giulia Pastor (AUSTRALO)
Contributing Partners	Andrea Torres (AUSTRALO), All
Reviewer(s)	Jason Rambach (DFKI)

Revisions

Version	Date	Comments	Author
V1.0	13.11.2023	Final Version	AUSTRALO, DFKI

Disclaimer

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1. Introduction

The efforts described in this report are directly linked to the execution of WP8 – Outreach, Exploitation and Collaboration, as described in the Description of Action (DoA).

This document details the activities of ecosystem building, dissemination, and communication carried out during the first year and a half of the HumanTech project as part of the master plan to maximise the project's impact, outlining the schedule for the next period (M19-M36).

It comprises the following sections:

- Dissemination and communication strategy and performance review, where the main achievements of T8.1 and T8.2 are summarised.
- Engagement activities, where the activities performed to engage with the stakeholders and the cluster Tech4EUConstruction are explained.
- Communication and dissemination activities implemented, where a comprehensive summary of all the D&C activities and main achievements are presented.
- Next steps where we explain the dissemination and communication plans for the second half of the project.

2. Dissemination & Communication strategy: performance review

As previously outlined in HumanTech's Impact Master Plan, communication and dissemination activities have been planned in three different phases (**Analysis, Increase Impact** and **Adoption/Targeted C&D**). The common goal was to build and nurture a community and brand around the project, maximise visibility, and engage with stakeholders to foster dialogue and collect feedback on the project's vision and progress.

In this regard, the **timeline** followed has been:

- During the first six months of the project, the project's visual identity and critical brand assets have been created, all Communication and dissemination channels have been set up, and the first mapping of stakeholders has been completed.
- From M6 to M12, the focus progressively shifted towards establishing a recognisable presence in all our digital channels, beginning the conversation with related initiatives, creating the Tech4EUConstruction cluster and working on additional promotional materials and long-form articles to cover the core concepts of the project for a wider audience.
- From M12 to M18, efforts have increased in event participation and publications, reinforcing the Tech4EUConstruction cluster activities, brainstorming and drafting HumanTech's value proposition and refining the engagement strategy for onboarding new projects into the Tech4EUConstruction cluster.

As of the creation of this deliverable, the main goal is to keep building the HT's presence in digital channels, reinforcing its core messages, linking them to upcoming results and fortifying the Tech4EUCluster and its activities (*more details in section 3*.)

In these 18 months, the project has managed to consolidate its *online presence*, mobilising a total of **1.350 followers** in social media (*see Section 4.1.1.2*), keeping up a meaningful, steady stream of weekly content with **600+ posts** in social media, **48 blog entries** and **12 Zenodo entries** overall.

This promotional effort has been boosted by increased participation in key *events, conferences and webinars*. The consortium's commitment to dissemination is also commendable: there are **six peer-reviewed and conferences publications** (*see Section 4.3 for more details*).

Of course, all these actions have been supported by a harmonised branding identity and a solid set of *promotional materials* (*see Section 4.2*), both in print (e.g. brochures, posters) and digital form (e.g. videos, clips, banners).

Last but not least, a specific effort has been dedicated, together with the sister projects BEEYONDERS and RoBétArmé, to create the Tech4EUConstruction cluster. The cluster aims to develop and demonstrate new technologies to digitalise further and automatise the European construction sector, targeting to increase its safety and attractivity for workers. The cluster also seeks to stimulate the EU's sovereignty in the industry, decreasing the need for technological imports. More information about the cluster, its members, its activities and next steps is available in Section 3.

The detailed list of HumanTec's **impact KPIs**, together with the updated targets at this point, is shown in the following table. A detailed breakdown of the project's metrics (e.g. website, social media) is provided in the dedicated sections addressing HumanTech's digital channels below.

Table 1 HT D&C KPIs

Name	KPI Index/ Calculation method	Target M18	Target M36	Actual Value
Journal publications	N. of peer-reviewed publications in journals	3	8	1
Conference publications	N. of peer-reviewed publications and presentations in conferences	7	16	5
Technical publications from trusted sources (e.g. articles, blog posts)	N. of non-peer-reviewed publications	15	30	48
Participation in events, including scientific conferences and trade fairs	N. of events attended	7	15	10
Workshops	N. of workshops organised / participated	2	5	6
	N. of participants per workshop	20	20	100
Website traffic	Monthly average views (users)	200	500	Av: 231/month; total: 3000; page views: 10657 (820 monthly average).
Social media presence	N. of followers (LinkedIn + Twitter + YouTube + newsletter subscribers)	1000	2000	1350
	Average monthly impressions	500	500	104492 (6530 monthly average)
PR material	N. of PR material produced	1	2	2 PRs, 1-pager, 4-pager, business cards, 2 roll-ups
Project videos	N. of videos produced	1	3	2
Project newsletters	N. of newsletter released by the project (at least 6)	3	6	3 (+ 9 external newsletters); 220subscribers

3. Engagement activities

As indicated in D8.1, during the first six months of the project, HT identified the stakeholders to be engaged during the project, schematised in the figure below:

Figure 1 HT Stakeholders picture

As a second step, from M6 to M18, HT focused on informing and engaging the stakeholders via dedicated activities, from typical dissemination and communication activities (i.e. events participation, workshops organisation, content creation on the website etc.) to specific ones, such as emailing campaigns and live demonstrations of the work.

In the table below, a summary of the D&C activities put in place to inform and engage our stakeholders is presented.

Table 2 D&C engagement activities

ACTIVITY	STAKEHOLDERS INVOLVED	SCOPE
Events/workshops organised/participated	ALL	Thanks to these activities, the consortium could present the project to various stakeholders, informing them about our activities and gathering feedback. The feedback is collected via a form that each partner completes after the event, underlying the main discussions held

		with the stakeholders, their feedback and suggestions.
Scientific publications	ALL- with more focus on category 2.	To reach the specific category 2, with emphasis on RTOs and academia, to share the knowledge acquired by the project and its future applications.
Newsletters & awareness publications	ALL	To constantly inform our community about the project advancements.

In addition to these activities, *ad hoc* efforts were put in place to inform the stakeholders about the project and engage with them:

Emailing campaigns.

From M6, WP8 launched periodic email campaigns to the HT stakeholders (via newsletters or one-to-one emails) to inform them about the main activities of the project, the advancements and the creation of the Tech4EUConstruction cluster.

How did HT do that?

First, WP8 created a database with the contacts of our stakeholders (including EU projects working in the same field), and contacted them (+500 emails), presenting the project, the goals, and the main activities; then, it also asked the stakeholders to follow us on social media and subscribe to the newsletters. This activity helped the project to reinforce its presence and community online.

In addition, the dissemination and communication Team managed, together with the Tech4EUCluster members, to organise an additional emailing campaign to invite other EU projects to join our cluster (more information in section 3.1.).

Live demonstrations.

During the General Assembly on August 23rd-25th, 2023, the partner SINTEF invited some experts from AF Gruppen, Norway's third-largest civil engineering and construction company, to assist to a live demonstration of HT's technologies.

The following demos were presented:

1. Simulator with the platform + robot, controlled from ROS.

   We could call this the Digital Twin of the robotic manipulator platform developed by Baubot. The Digital Twin is an exact copy of the real robot (which is still under building) and is controlled and acts exactly as the real robot. We need such a Digital Twin to experiment without having physical access to the real robot. Digital Twins are widely used in the manufacturing sector and gaining more interest in the construction sector!

2. Real-time tracking of bricks with RealSense camera

   A robot has no eyes to see what it needs to pick up. This demonstration showed how the robotic platform could see the task's object (a classic brick used in masonry). Behind the scene is a learning algorithm supported by AI to understand what a brick is and where the robot could pick it up!

3. Learning simulator with haptic (or 6DoF) device.

   The demonstrator focuses on controlling the Digital Twin shown in the first demonstration. When commands are executed in a virtual scenario (computer simulation), we need to provide feedback to the user. In this demonstration, the user could feel ("really") the resistance and contact forces when the robot collided with some virtual object in the computer simulation.

4. Speech interface.

   The demonstrator showed the possibilities of how humans could interact with a robotic system. By using voice commands (speech interface) or with hand gestures (glove tracking), you naturally and intuitively interact and command a robotic system. Not only hand gestures were demonstrated, but also camera-based human poses too.

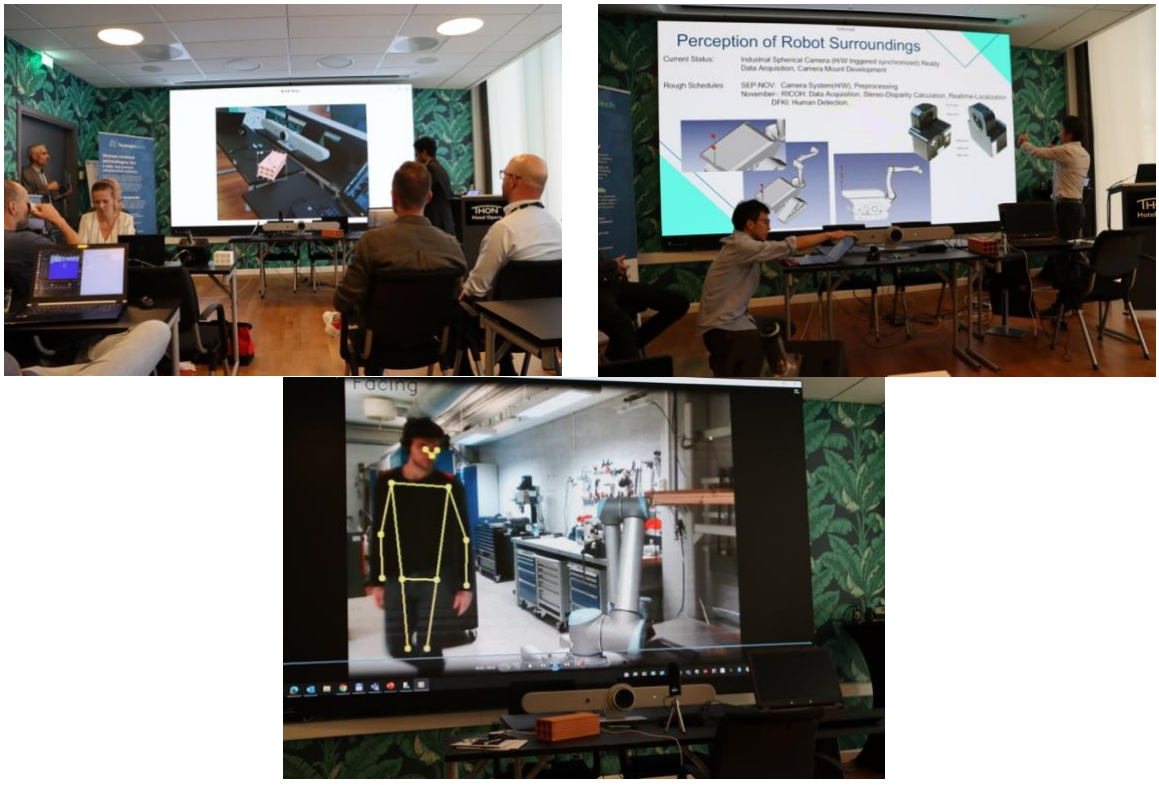

Figure 2 HumanTech live demos in Oslo

The scope of this activity was to present the HT's work to potential users, to collect their initial feedback and to have open discussions. During the demonstrations, the

stakeholders underlined the benefits of participating in the HumanTech live demonstration, knowing "what's new" in technology, looking for new opportunities, and "deleting" the bias for not being afraid of new technologies. All of that can help them develop and reinforce new/existing businesses.

3.1 Tech4EUConstruction Cluster

After the successful AI and Robotics in construction workshops organised at the European Robotic Forum 2023 with the sister projects Beeyonders and RoBétArmé, WP8 formally signed the collaboration by creating a cluster named Tech4EUConstruction.

The three projects aim to develop and demonstrate new technologies to digitalise further and automatise the European building sector, increasing its safety and attractivity for workers. Furthermore, the cluster seeks to stimulate the EU's sovereignty in the industry, decreasing the need for technological imports.

The main objective of the Tech4EUconstruction cluster is to share knowledge between the projects on different aspects:

- Mutual exchange of technical expertise and project innovations.
- Implement joint communication campaigns to raise cluster awareness (such as the Words of Innovation campaign on social media.)
- Share knowledge and plans on exploitation actions.
- Mutually promote the projects' principal activities and achievements.
- Co-organisation of events, workshops, panels, etc.

With the above in mind, the first activity was creating recognisable branding with a logo, specific fonts and a colour palette.

Figure 3 Tech4EUConstruction Logo

This logo concept comes from the idea of a building being constructed plus the initial letter T: thanks to the clever use of negative space, the logo represents a portion of a building without the roof and a door, so you can have a peak into the inside of it, with some orange light going through the doorway and a side window.

The idea is to convey the concept of an evolving process, while the light symbolises technology and innovation somewhat “invading” the construction field.

The logotype (which is the written part) is a very clean and modern font, characterised by blocky shapes that recall construction blocks while, at the same time, being coherent with the rest of the logo. The chosen colours are blue and orange, standing for technology (blue) and the disrupting force of innovation (orange).

Since one of the main scopes of the cluster is to organise joint dissemination and communication activities, the cluster decided to start this collaboration with a joint Communication campaign on social media named Words of Innovation.

This campaign aims to delve into essential and innovative aspects of the cluster work by defining simple keywords. The partners of each project briefly explained the technologies and strategies they are developing to address the challenges facing today’s European construction industry.

Some examples of videos:

- #MobileManipulationTechnology
- #ConstructionSMEs
- #GreenAndDigitalSkills
- #WereablesInConstruction

Other interesting videos can be found on the cluster members' LinkedIn pages by searching these hashtags: **#Tech4EUConstruction** and **#WordsOfInnovation**.

Figure 4 Ex. of a video posted on LinkedIn

The cluster is organising periodic meetings to plan and schedule additional activities, such as mutual participation in project's newsletters, organisation of workshops (the cluster submitted – and it was accepted – a joint workshop to be held during the European Robotic Forum 2024) and joint campaigns.

In addition, during the cluster's last meetings, it discussed the possibility of inviting new projects to join the cluster. As a result, a list of projects that could fit in the cluster has been prepared. This is the preliminary list created:

- Improved Robotic Platform to perform Maintenance and Upgrading Roadworks: https://www.heron-h2020.eu/
- Value Of Joint EXperimentation in digital Technologies for manufacturing and Construction: https://vojext.eu
- Optimal Construction Management & Production Control: https://bim2twin.eu/
- On the edge AI-driven Autonomous Inspection Robots: https://cordis.europa.eu/project/id/190127887
- An INClUsive toolBox for accElerating and smartening deep renovation: https://cordis.europa.eu/project/id/101069610
- Automated solutions for sustainable and circular construction and demolition waste management: https://cordis.europa.eu/project/id/101058580

- Repurposing construction materials towards a circular industry: https://www.reincarnate-project.eu/

The cluster prepared a Collaboration Framework document (see Annex A), which explained the scope of the cluster, its main activities and the benefits for other projects to join. With an accompanying email, this document has been sent to the projects to be invited. When writing this deliverable, the team had already received the OK from the Reincarnate project.

This is just the beginning; more information on the next steps is reported in Section 5 of this deliverable.

4. Communication and dissemination activities implemented.

The dissemination and communication activities implemented from M6 to M18 focused on two main aspects:

- Make the results open and available for the stakeholders to facilitate the usage of them (dissemination activities)
- Promote and increase the visibility of the project activities, achievements, team, etc. (communication activities).

In the following chapter, a description of the central dissemination and communication activities carried out by the project in the timeframe M6-M18 is presented, focusing on:

- The online channels used;
- The Promotional material created;
- The publications;
- The events/workshops participated/organised.

4.1. Online channels

4.1.1.1 Project website

Project website	https://humantech-horizon.eu/

HumanTech's website showcases the project's main ideas, approach, news, findings, and results from our use cases. It is continuously updated with HT's latest news (at M18, we published 48 news, with an average of more than two blog posts per month) and scientific publications. When needed, updates on the content and the Team were also done.

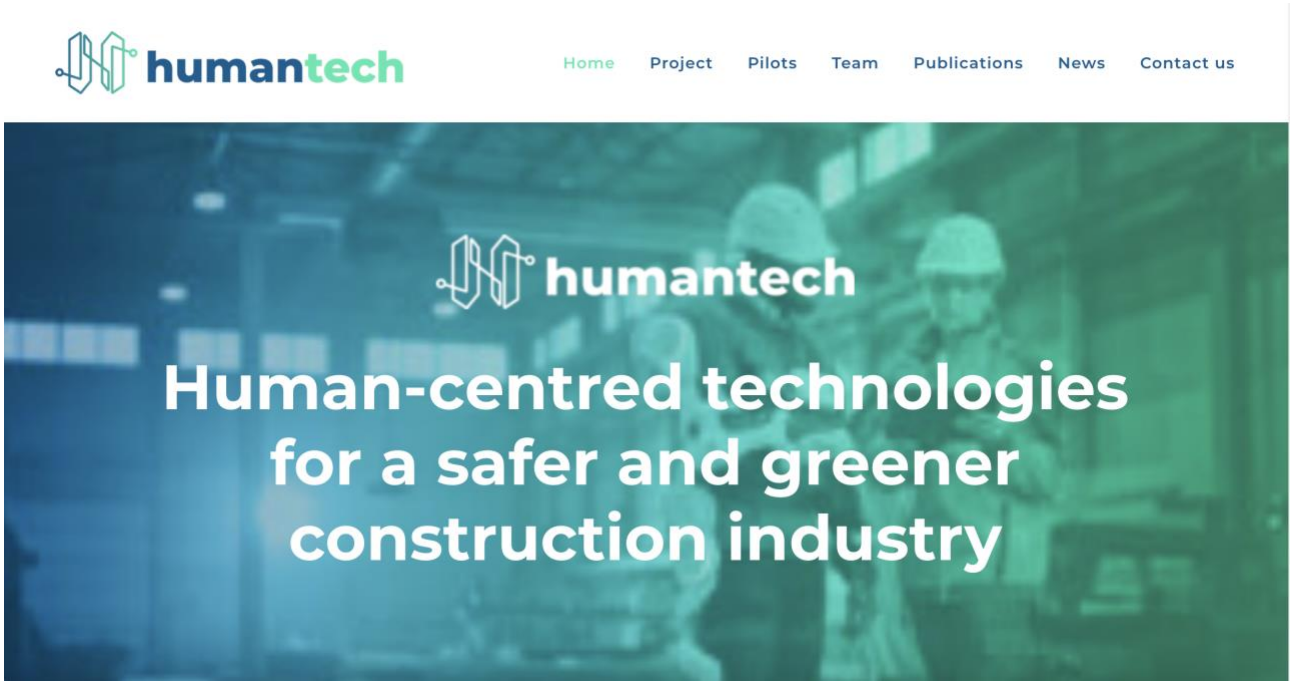

Figure 5 HT website

It has been designed following the branding elements set up at the beginning of the project (*see D8.1*), and it follows this structure:

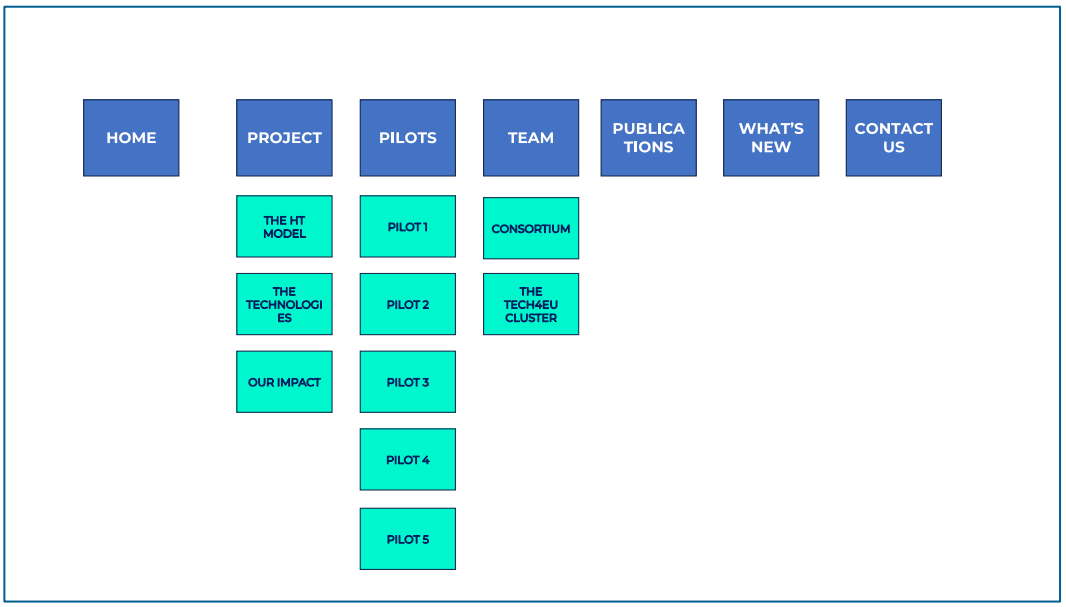

Figure 6 HT's website tree

In terms of performance, the breakdown of the site's metrics on Google Analytics is presented below. This overview spans the project's run so far and shows the aggregated totals from the official launch of HumanTech's website (August 2022) to the present moment. During the 18 months under consideration, the website has driven traffic of **3.000 users, 5.200 sessions** (an interval in which a user interacted with our website), and **10.657 views** (820 average monthly views).

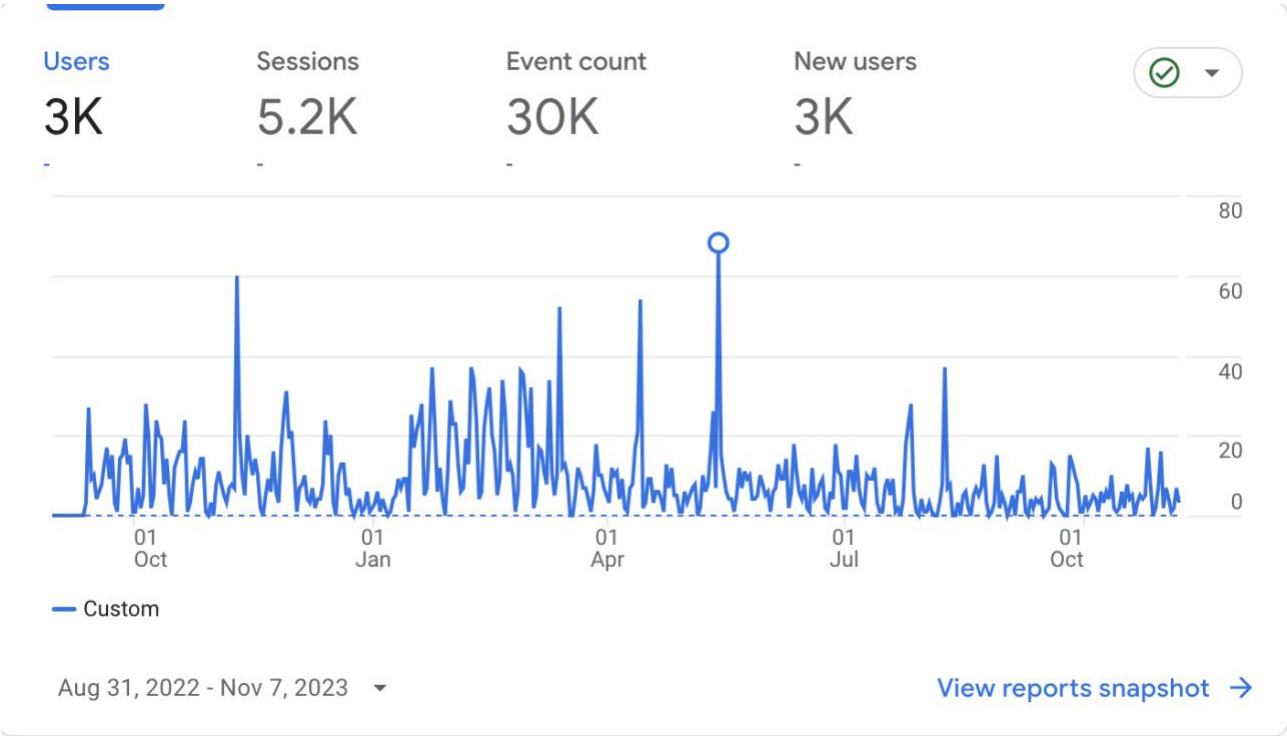

Figure 7 HT's website analytics

The three countries from which most users visit the website are Germany, Ireland, and the United States.

Figure 8 HT users per Country

The **pages with the most views** in order of relevance are Home (with 3479 views, 32,6% of the website traffic), News (1040 views) and Team (1014 views).

From the first release of the website at M3, some new features were added:

Publications page, where the HumanTech scientific publications are included as they are available on the project's Open Access platform.

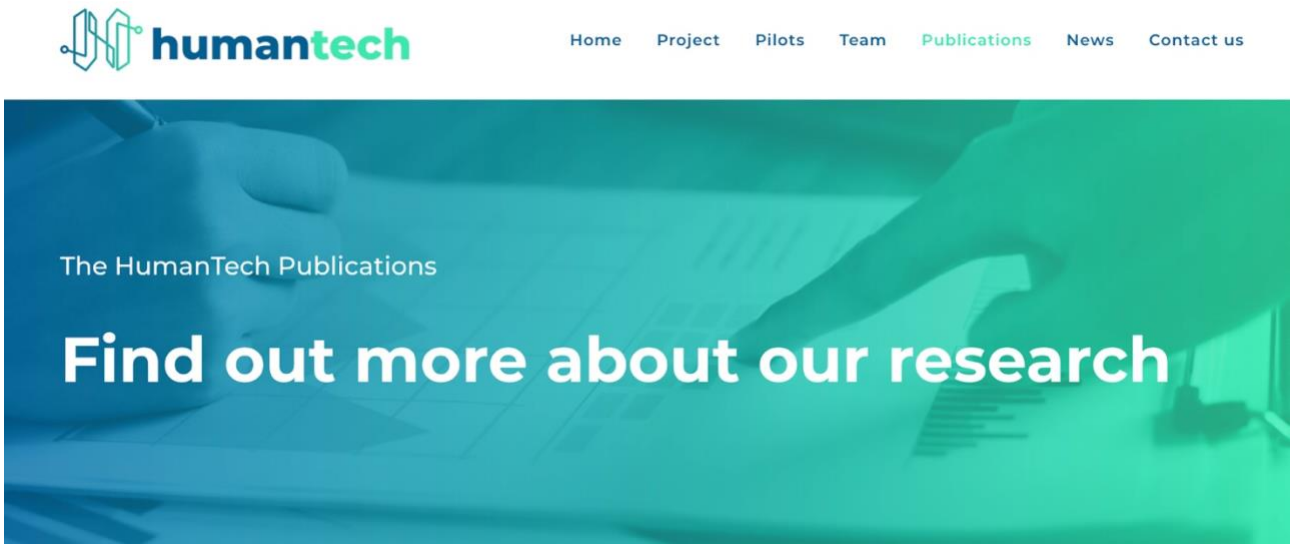

Figure 9 Publications page

A new subsection has been added to the Team section, highlighting the **Tech4EUconstruction cluster**. On this page, the cluster and its leading members are presented.

Figure 10 Tech4EUConstruction page on HT website

4.1.1.2 Social media

LinkedIn	**https://www.linkedin.com/company/humantech-eu**
Twitter	**https://twitter.com/HumanTech_EU**
YouTube	**@humantecheu**

HumanTech maintains an active presence on **Twitter, LinkedIn** and **YouTube** with an aggregated audience of **1.352 followers** between the three platforms. Social media is a quick and effective way to directly engage with the project's wider audience and other key related initiatives and promote HumanTech's achievements in publications, events and partners' initiatives.

To keep the audience always interested, the D&C team created different LinkedIn and Twitter campaigns and stories covering various topics:

- #HumanTechNews + #HumanTechEvents + #HumanTechPublications: Highlighting project updates on different topics.
- #HumanTechTeam: Stories from the HumanTech team members.
- #FutureofResearch: Stories from the junior staff working on the project, providing feedback on their experience in an EU project and what this means for their future career.
- #HumanTechBenefits + #HumanTechTechnologies + #HumanTechLearningPills: Highlighting the benefits and impact of the HumanTech project and technologies.
- #1YearofHumanTech: Celebrating the project's achievements after one year.
- #Tech4EUconstruction + #WordsOfInnovation: Highlighting the different actions around the project's Tech4EUconstruction cluster with its sister projects.

LinkedIn is HumanTech's social channel with the most reach & engagement, with a community of **426 followers, 74.842 post impressions, 42.533 Page & profile reach and 3.025 post video views.**

As far as the content, these are the ten posts with the most impressions:

1. **#HumanTechEvents** | HumanTech at KOMMUNALE Congress in Nürnberg, Germany, with its partner Implenia.
2. **#FutureofResearch** | Editorial from HumanTech's team member Harsh Manoj Shah, master's student at the Technical University of Munich and working student at Hololight, one of its partner organisations.

Figure 11 HT Unlocking the Future of Research

3. **#HumanTechTeam** | Interview with Gabor Sziebig, research manager at SINTEF, leading HumanTech's work package focused on construction robotics and human-robot collaboration.
4. **#FutureofResearch** | Editorial from HumanTech's team member Mahdi Chamseddine, a PhD student at RPTU Kaiserslautern-Landau working in the Augmented Vision department of DFKI.
5. **#HumanTechNews** | Interview with Markus Miezal, Researcher at Sci-Track, about its motion capture technology to improve construction workers' safety and provide services for human-robot collaboration.
6. **#1YearofHumanTech** | HumanTech's first scientific publication.
7. **#HumanTechTeam** | Implenia partners Patrick Roth and Sebastian Mattes interview, who represent the end-user point of view at HumanTech.
8. **#GreenConstruction** | EU startups building a more sustainable future and accelerating the industry's green transition through innovative solutions.
9. **#HumanTechNews** | HumanTech's first radio appearance. Interview with partner Fabian Kaufmann, Researcher at the University of Kaiserslautern, on the German radio Antenne Kaiserslautern GmbH.
10. **#WordsOfInnovation** | Partner Gloria Callinan, Project Support Officer at the Technological University of the Shannon, who leads this work at

HumanTech, explains some of the areas where there's a need for more skilled workers in the building sector.

With a community of **916 followers and 25.668 post impressions**, **Twitter** allows the project to promote its activities, results and goals and engage the stakeholders effectively. As for LinkedIn, the D&C team diversified the content published, scheduling weekly posts and diversifying the content, following the Social media campaigns presented above.

The highest performing tweet, with more than 1.500 impressions, summarises the achievements of the first year, meaning that the audience in this social media is more interested in posts with technical content. The strategy for the second part of the project will follow this path: more content related to the advancements in the project.

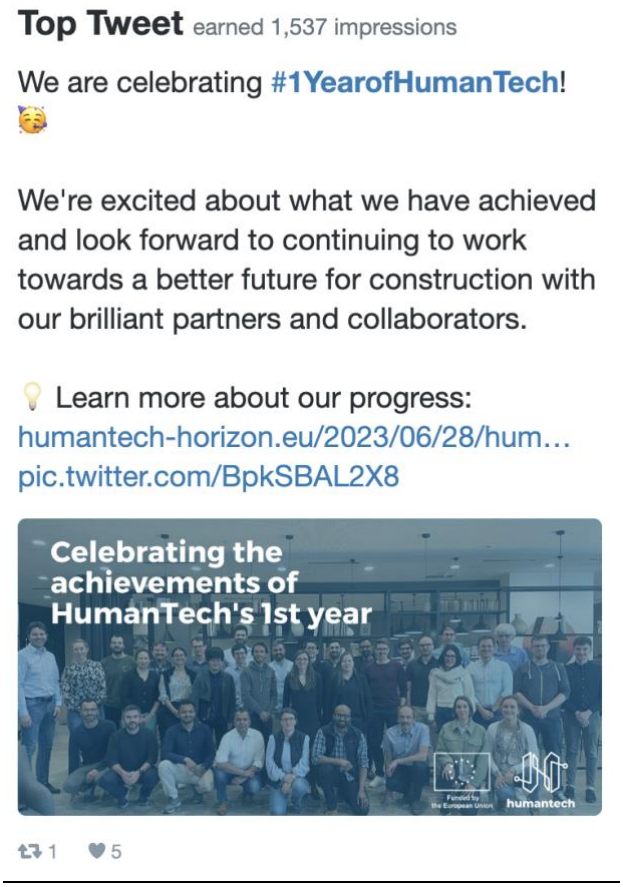

Figure 12 HT top tweet

YouTube serves as the repository for all the videos published in the project. Once posted there, dedicated promotional activities were scheduled, achieving the following results:

- Views: 264
- Watch time (hours): 9.2
- Impressions: 3,982

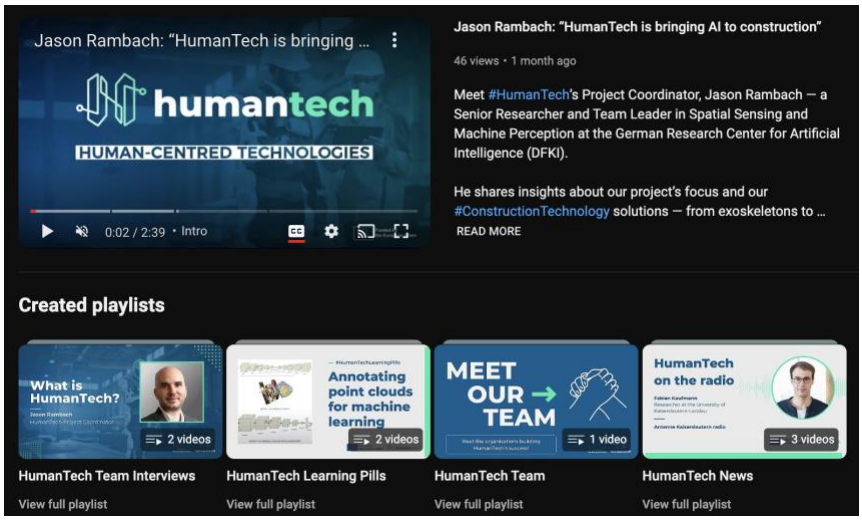

Figure 13 HT YT channel

The following playlists were created:

- HumanTech Team Interviews
- HumanTech Learning Pills
- HumanTech Team
- HumanTech News

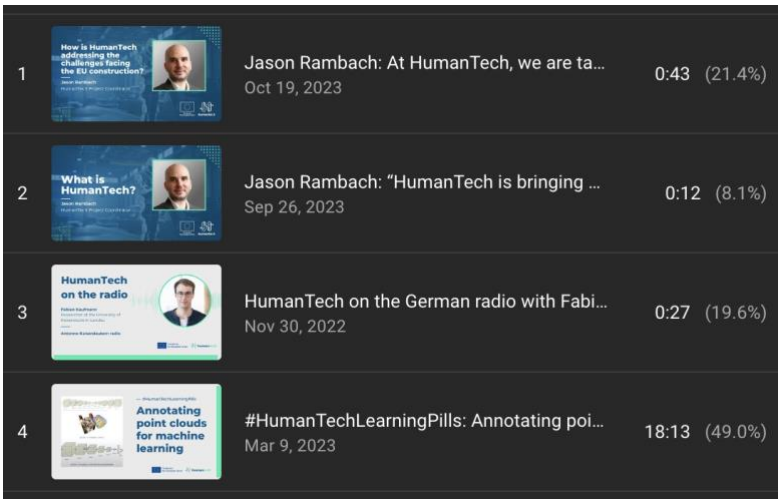

Figure 14 HT best performing videos

4.1.1.3 Newsletters

Newsletters are a simple and effective tool to i) make the results of the project available for the stakeholders while ii) promoting the main activities of the project.

In the first year, the Consortium published two newsletters (M06-M12). Since October 2023, the team will publish one every four months, as the project will have more results to share in its successive phases, focusing more on the technical achievements.

- Newsletter 1: Project's month 6.
- Newsletter 2: Project's Year 1.
- Newsletter 3: Project's month 17.

The content of each newsletter has been carefully designed to keep the readers interested. Each newsletter has been sent via Brevo (57 subscribers) and published on LinkedIn (163 subscribers) using the LinkedIn Newsletter service.

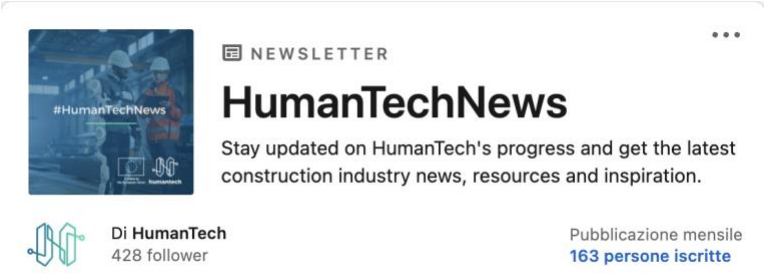

Figure 15 HT LinkedIn Newsletter

Each newsletter is composed of the following sections:

HumanTech-focused

- An introduction highlighting the project's progress and next steps.
- HumanTech Stories: Latest projects news.
- Meet the HumanTech Team + Unlocking the Future of Research series.
- Tech4EUconstruction Cluster.

Beyond HumanTech

- Opportunities to Take Action.
- Inspiring Resources.

In addition to this, HT participated in several external newsletters, amplifying its audience and reaching more stakeholders:

- EBC's September 2022 Newsletter.

- HT's on ASHVIN newsletter (November 2022).
- EBC's December 2022 newsletter.
- HT's on Reincarnate newsletter (December 2022).
- HT's on EBC newsletter (February 2023).
- HT's in Safety in Tech newsletter (March 2023).
- HT's in ASHVIN Newsletter (March 2023).
- HT's in EBC Newsletter (May 2023).
- HT's in EBC Newsletter (August 2023).
- HT's in BEEYONDERS newsletter (September 2023).
- HT's in Robértarmé newsletter (September 2023).

Regarding the LinkedIn Safety in Tech newsletter, it is worth noting that it has more than 4.000 subscribers; this represents an important achievement for the promotion of the project.

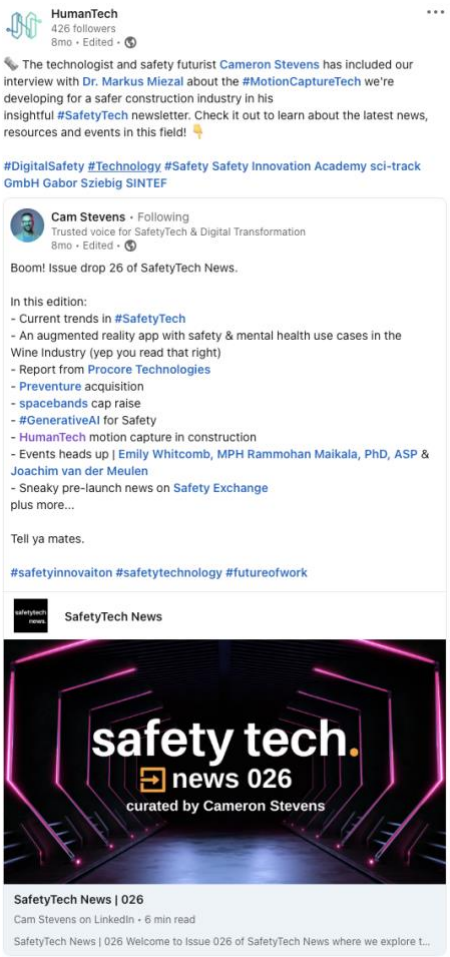

Figure 16 HT's in the Safety in Tech newsletter

Regarding the activities related to the press, HumanTech produced two Press releases (more than 500 views on Zenodo):

1. HumanTech Project Launch Press Release.
2. **Press Release: Standards Supporting Smarter and Greener Construction in Europe.**

In addition to this, some partners have appeared in media:

HumanTech on the German radio with Fabian Kaufmann.

Press item 1 Sintef.

Press item 2 Sintef.

Press item 3 Sintef.

4.1.1.4 Zenodo

Zenodo	https://humantech-horizon.eu/

Following the European Commission guidelines for Open Science, HumanTech provides open access to peer-reviewed publications, public deliverables, brand assets and other resources generated within the project.

A dedicated Zenodo community and repository is already in place for the project, where all sorts of publications (e.g. articles, posters…), press releases and more can be found. Public deliverables will be uploaded on Zenodo and on our website once validated by the European Commission.

Thanks to the promotional strategy set up to make the project's results available to our stakeholders, we achieved more than **470 views** for the 12 documents uploaded on Zenodo.

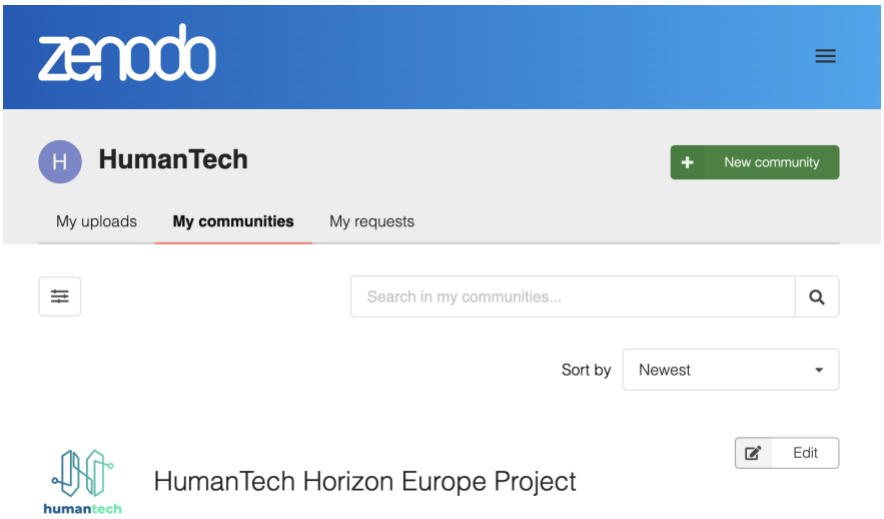

Figure 17 HT Community on Zenodo

4.2. Promotional material

4.2.1.1 Printed material

WP8 created a simple flyer and one one-pager with two objectives: 1. Accompanying email campaigns and 2. Be shown online and during conferences and events.

The one-pager is available in English and Spanish (it has been used during the workshops organised by WP6 to validate the HT's technologies with the end-users).

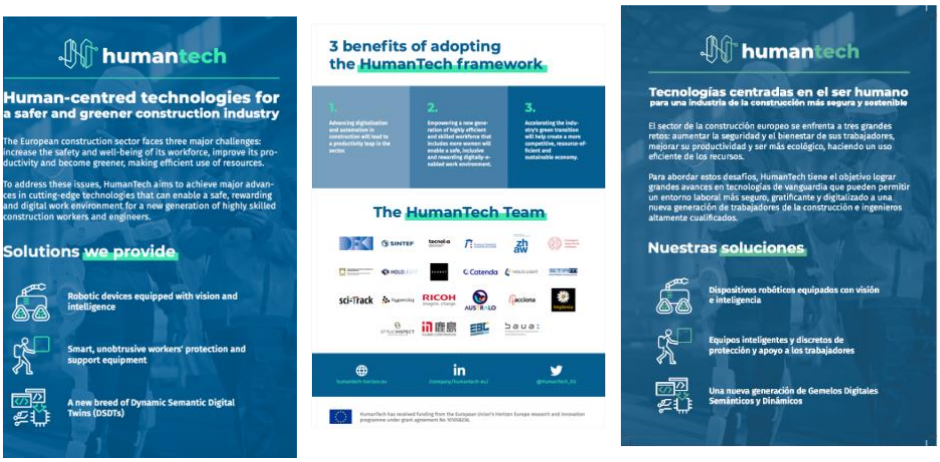

Figure 18 HT one-pager EN-SPANISH

WP8 also produced a roll-up that has been printed for participation in several dissemination events and workshops and the HumanTech Business cards.

Figure 19 HT roll-up and business card

Specific PR material has also been created for the AI and Robotic workshop at ERF 2023.

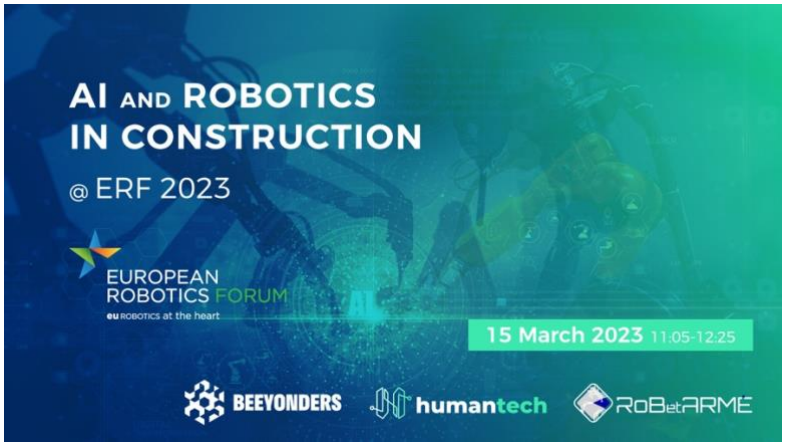

Figure 20 Event Banner

Figure 21 ERF Leaflet

4.2.1.2 **Multimedia material**

To make HumanTech's social media posts more engaging and captivating, HT's social media manager created a set of short clips to accompany the most relevant posts, such as:

- HumanTech important announcements and achievements.
- HumanTech Anniversary.
- HumanTech newsletters.
- HumanTech events organisations and participations.

Some examples:

- HumanTech first field activity: Multi-sensor data capturing
- HumanTech Y1 achievements
- Meet our Team
- HumanTech GA Meeting
- HumanTech Events

In addition, during the GA meeting in Oslo, WP8 also interviewed some partners to gather material for publishing videos explaining the project, its main activities, impact and benefits.

In the first two videos, which are already available on the HT YT channel, the Project Coordinator, Jason Rambach, explains the following:

- How would you define HumanTech?
- Who makes up the HumanTech team?
- What inspires you most about this project?
- What are the main challenges facing the European construction sector today?
- How are we contributing to addressing them?
- What are the most important results we have achieved so far?
- Finally, what are our next steps towards accelerating the green and digital transition of the EU construction ecosystem?

The interviews are available on the YouTube channel:

- Interview 1.
- Interview 2.

We also interviewed other partners to diversify the questions and cover different important aspects of our project. The following interviews will be published on our YT channel by the end of M19:

Table 3 HT's interviews

Interview	Questions
Interview 3.	What will our technologies help us to achieve? What benefits do they bring (and to whom)? Do they suppose an advancement for the construction industry? And the industry workers and stakeholders? What does each technology consist of? (Brief explanation about each pilot)
Interview 4.	According to Eurostat, in 2020, more than a fifth of all fatal accidents at work in the EU took place in the construction sector. Also, 70% of all accidents caused wounds and superficial injuries, dislocations, sprains and strains, or concussions and internal injuries to workers in the industry. How will HumanTech technologies improve the health and safety of construction industry workers, and what negative impacts will they allow to avoid? With our HumanTech technologies, we strive to contribute to the digitalisation and automatisation of the construction industry, making it safer, greener and more efficient. Can you share any examples in which emerging technologies have promoted healthy workplaces? Why is it important to maintain a human-centered perspective when developing and using technological advances? How does this focus help us guarantee the health and safety of workers who will use HumanTech technologies?

Interview 4.	One of the main challenges facing the construction industry is its **labour shortage** – specifically of qualified workers with digital and green skills. It's vital to improve specialised training and make the sector more attractive and rewarding to highly skilled construction professionals. **How will HumanTech technologies contribute to this ambition?** At HumanTech, we will create and deliver **educational resources and training sessions** to teach professionals and educators about our technologies for workers' safety, well-being, and human-robot collaboration in construction. **What will they consist of and what will they contribute to?**
Interview 5.	Buildings account for the largest share of total EU final energy consumption (40%) and produce about 35% of all greenhouse emissions. **How are HumanTech technologies contributing to creating a more environmentally friendly construction industry?** HumanTech will deploy and validate its technical approach in five different large-scale construction demonstration sites in Europe and Japan. **What will these pilots consist of, and how will they feed the project's technical developments?**

In addition, WP8 took advantage of the in-person meeting to film some keywords for the "Words of Innovation" campaigns, as reported in Section 3.1.

4.3. Publications

4.3.1.1 Scientific publications

HumanTech, from M1 to M18, published the following scientific publications:

Table 4 HumanTech scientific publications

CATEGORY	TITLE	PLATFORM	STATUS	OPEN ACCESS
Journal paper	OPA-3D: Occlusion-Aware Pixel-Wise Aggregation for Monocular 3D Object Detection	IEEE Robotics and Automation Letters	Published	https://zenodo.org/record/7621552
Conference paper	BIM-based construction quality assessment using Graph Neural Networks	40 *th* International Symposium on Automation and Robotics in Construction (ISARC 2023)	Published	https://zenodo.org/record/8186527
Conference paper	ONTOLOGY-BASED SEMANTIC LABELING FOR RGB-D AND POINT CLOUD DATASETS	2023 European Conference on Computing in Construction	Published	https://zenodo.org/record/8186592

Conference paper	Annotation rules and classes for semantic segmentation of point clouds for digitalization of existing bridge structures	2023 European Conference on Computing in Construction	Published	https://zenodo.org/records/8189036
Conference paper	U-RED: Unsupervised 3D Shape Retrieval and Deformation for Partial Point Clouds	ICCV Conference 2023	Published	https://zenodo.org/records/10085251
Conference paper	Single Frame Semantic Segmentation Using Multi-Modal Spherical Images	WACV Conference 2024	Accepted	January 2024

4.3.1.2 **Awareness publications**

HumanTech's consortium has also been active and enthusiastic in producing non-scientific publications. In this regard, there is a **dedicated News section** on the project's website, which currently displays 48 news pieces ranging from press releases, publications, interviews, editorials, and events to general project updates.

WP8 put a structured editorial calendar in place from the beginning of the project to keep the audience and stakeholders always interested in its activities.

WP8 structured the publications as a "series" to continuously diversify the content, tell exciting stories and transfer the knowledge acquired in the project.

The series published until M18 can be regrouped as follows:

- Meet the team: interviews with partners.
- What is HumanTech: articles about the project, its technical achievements, progress, benefits and next steps. In this series, WP8 also covers the awards won by the Consortium.
- Unlocking the future of Research Editorial: to give voice to the junior staff working on the project.
- HumanTech events and workshops: blogs about the participation/organisation of events/workshops.
- Cluster and collaborations: blogs about collaborating with other initiatives and the cluster's activities.

The following blogs were published:

Table 5 HT blog posts

Title	Series
We meet in Germany to launch HumanTech!	Events
HumanTech arrives to develop human-centred construction technologies	What is HumanTech
5 objectives to understand what HumanTech is all about	What is HumanTech
Meet the HumanTech team: Jason Rambach, his passion and motivation guide our project	Meet the Team
DFKI augmented vision researchers won 2 awards in the Object Pose Estimation challenge (BOP Challenge, ECCV 2022)	What is HumanTech
Meet the HumanTech team: Bharath Sankaran, improving lives through sustainable innovation	Meet the Team
Our first field activity: Multi-sensor data capturing	What is HumanTech
Meet the HumanTech team: Gabor Sziebig, an automation ally for the digitalisation of construction	What is HumanTech
HumanTech on the German radio with Fabian Kaufmann	Meet the Team
Researchers from RPTU win the Best Paper Award at EC^3	What is HumanTech
Meet the HumanTech team: Fabian Kaufmann, committed to making the construction industry more efficient and safe	Meet the Team
Meet the HumanTech team: Gloria Callinan, passionate about sustainability and collaboration	Meet the Team
The European Builders Confederation at HumanTech	Meet the Team
AI and Robotics in Construction: Workshop at the European Robotics Forum 2023	Events
Meet the HumanTech team: Florendia Fourli, passionate about innovation, technology, and creative problem solving	Meet the Team
Meet the HumanTech team: Francesca Canale, convinced that HumanTech technologies will enable a more inclusive construction industry	Meet the Team
HumanTech Publication: OPA-3D – Occlusion-Aware Pixel-Wise Aggregation for Monocular 3D Object Detection	Publications

Next steps at HumanTech: Our plans for 2023	What is HumanTech
Using motion capture technology to reduce workplace injuries in construction	What is HumanTech
Meet the HumanTech team: Patricia Rosen, studying how technology affects us to promote healthier workplaces	Meet the Team
Meet the HumanTech team: Carina Pamminger, driven by infinite curiosity	Meet the Team
AI and Robotics in Construction: HumanTech's first workshop at the ERF 2023	Events
We celebrate our 2nd Executive Board Meeting	Events
Press Release: Standards Supporting Smarter and Greener Construction in Europe	Collaborations & Cluster
Meet the HumanTech team: Anurag Bansal, confident that our HumanTech technologies will improve construction safety and productivity	Meet the Team
Meet the HumanTech team: Rachele A. Bernardello, pioneering innovation in construction and engineering	Meet the Team
Meet the HumanTech team: Arantxa Renteria, advancing robotics for safer and greener construction	Meet the Team
Meet the HumanTech team: Markus Miezal, passionate about technology and its positive impact Meet the HumanTech team: Soungho CHAE, innovating in construction working methods	Meet the Team
Meet the HumanTech team: Patrick and Sebastian, questioning construction's status quo	Meet the Team
Building the future: The benefits HumanTech technologies bring to construction workers	What is HumanTech
Meet the HumanTech team: Fernando Sigchos Jiménez, moved by his passion for improving construction for a safer and greener future	Meet the Team
Human Factors in Construction Robotics: Special Session on the 19th IEEE ARSO Conference	Events

Meet the HumanTech team: Hideaki Kanayama, revolutionizing the construction industry through innovative technology	Meet the Team
Unlocking the future of research: Chiara Zarna, research scientist at SINTEF	Unlocking the Future of Research
HumanTech wins 3rd place in the CV4AEC workshop's Scan-to-BIM challenge at CVPR 2023	Events/What is HumanTech
Tech4EUconstruction cluster: revolutionizing the construction sector together	Collaborations & Cluster
Celebrating the achievements of HumanTech's first year	What is HumanTech
HumanTech General Assembly Meeting in Oslo	Events
Jason Rambach: "HumanTech is bringing AI to construction"	What is HumanTech
Tech4EUConstruction cluster launches "Words of Innovation" campaign	Collaborations & Cluster
Unlocking the future of research: Mahdi Chamseddine, PhD student at RTPU Kaiserslautern	Unlocking the Future of Research
Unlocking the future of research: Harsh Manoj Shah, master's student at the Technical University of Munich	Unlocking the Future of Research
Jason Rambach: At HumanTech, we are tackling the challenges of EU construction with innovation	What is HumanTech
Implenia at KOMMUNALE Congress 2023: Showcasing innovations in construction	Events
User-centered development: Evaluating HumanTech technologies for a safer, greener construction	What is HumanTech
Unlocking the future of research: Irati Rasines, PhD student at the University of the Basque Country and Tecnalia	Unlocking the Future of Research
HumanTech's progress update in month 16	What is HumanTech

4.4. Events

HumanTech has been prominently featured in **9 events** and **6 workshops**.

CATEGORY	TITLE	DATE	DESCRIPTION	PARTNER(S) ATTENDING
Conference	The International Symposium on Reliability Engineering and Risk Management (ISRERM)	4-7/09/2022	HumanTech work: state of the art methodology and methodological approaches to be used in HumanTech were presented	Technische Universität Kaiserslautern
Conference	5th bridge colloquium. Specialist conference on assessment, repair, upgrading and replacement of bridges	6-7/09/2022	HumanTech work: state of the art methodology and methodological approaches to be used in HumanTech were presented	Technische Universität Kaiserslautern
Workshop	7th International Workshop on Recovering 6D Object Pose at ECCV 2022 Conference	23-27/10/2022	Participation and award in BOP Challenge 2022 on object pose estimation	DFKI
Event	ELIV MarketPlace 2022	18-19/10/2022	International VDI Congress "ELIV" - The world's largest congress for automotive electronics, software and applications	DFKI, TUK
Workshop	AI and Robotics in Construction, European Robotics Forum 2023	15/03/23	AI and Robotics in Construction workshop organised with our sister projects BEEYONDERS and RoBétArmé	DFKI, EBC

Workshop	Focus Group on human-centered technologies for construction	16/05/23	HumanTech technologies user requirements feedback	ACCIONA + TECNALIA
Event	IEEE ARSO - 19th IEEE International Conference on Advanced Robotics and Its Social Impacts	06/06/23	Human Factors in Construction Robotics (organised session)	SINTEF
Workshop	Focus Group on human-centered technologies for construction	15/06/23	HumanTech technologies user requirements feedback	ACCIONA + TECNALIA
Workshop	3rd Workshop and Challenge on Computer Vision In The Built Environment For The Design, Construction and Operation of Buildings	18/06/23	HumanTech wins 3rd place in the CV4AEC workshop's Scan-to-BIM challenge at CVPR 2023	DFKI + RPTU
Event	ISARC 2023	4-7/07/2023	International Symposium on Automation and Robotics in Construction	NASKA.AI
Event	AI For Good Summit	6-7/07/2023	The AI for Good Global Summit is the leading action-oriented United Nations platform promoting AI to advance health, climate, gender, inclusive prosperity, sustainable infrastructure, and other global development priorities.	NASKA.AI
Event	European Conference on Computing in Construction	9-13/07/2023	https://www.linkedin.com/feed/update/urn:li:activity:7084124368368193536/?actorCompanyId=78328194	RPTU

Event	European Conference on Computing in Construction	9-13/07/2023	EC^3 is the premier European Conference for information, communication and technological research, innovation and policy for the Construction Sector as a whole in Europe. It is the annual meeting organised by the European Council for Computing in Construction, with the purpose of bringing together researchers, practitioners and construction industry professionals from around Europe to meet and share information about the latest developments in all aspects related to computing in construction. The EC^3 conference aspires to establish an active dialogue on the challenges in the field of Computing in Construction and provide a forum to present the latest advances in research and professional practice on this domain.	RPTU
Workshop	Workshop on Interfacing and BIM visualisation	21/07/23	Workshop with members of the HumanTech consortium to immerse ourselves in multiple scenarios involving the visualization of dynamic semantic digital twins (DSDT) at construction sites	HumanTech partners
Event	Fachmesse und Kongress für Kommunalbedarf | KOMMUNALE	18-19/10/2023	Implenia has its booth and presented the project	Implenia
Conference	ICCV, International Conference on Computer Vision	02-06.10.2023	Presentation of paper and participation in BOP 2023 challenge	DFKI

The events/workshops with the main impact on the project were:

- The HumanTech's Project Coordinator Jason Rambach and Yongzhi Su and Praveen Nathan, scientists at partner organisation DFKI Augmented Vision Research Unit, have received the first prize in the prestigious BOP Challenge 2022.

Figure 22 HT at BOP Challenge 2022.

- The DFKI team participated again in the 2023 edition of the Object Pose Estimation challenge (BOP Challenge, ICCV 2023) and won three awards: the awards were received by Yongzhi Su and Dr. Jason Rambach on behalf of the DFKI Team, and a short presentation of the method followed. The winning method was based on the CVPR 2022 paper "ZebraPose" .

Figure 23 HT at BOP Challenge 2023

- The partners from the University of Kaiserslautern-Landau (RPTU) Fabian Kaufmann, Christian Glock, and Thomas Tschickardt received the Best Paper Award at the 2022 European Council on Computing in Construction (EC^3) for their publication on ScaleBIM.

Figure 24 HT Best paper award

- The project won the 3rd place in the CV4AEC workshop's Scan-to-BIM challenge at CVPR 2023;
- Thanks to the co-organisation of the AI and Robotics in Construction workshop organised at ERF 2023 with our sister projects, Robértarmé and Beeyonders, we created the Tech4EUConstruction cluster. The follow-up workshop for ERF 2024 has been accepted.

5. Next steps

The primary purpose of the dissemination is to make the project results available to the stakeholders and to transfer the knowledge acquired to them.

During the second part of the project, where the results and technologies of HumanTech will be more mature, the partners will increase their efforts to ensure all the stakeholders will be aware of the project's outcomes and activities.

From M19 to M36, the following activities will be reinforced:

- **Participation in events, conferences, and workshops**: HumanTech will participate in events and present the results - *to reach the KPI of more than 15 events participated/organised*. When writing this deliverable, HT received the acceptance confirmation, for the second year in a row, to organise, with the cluster, a workshop during ERF 2024.
- **Peer-reviewed publications:** as reported in this deliverable, six publications have already been published. HumanTech will continue submitting papers in the last part of the project to make the final results available to our stakeholders. In particular, there are currently publications planned on object pose estimation (DFKI), Scan2BIM (DFKI/RPTU), User Evaluation Study (BAUA/TUS/TECNALIA/DFKI).
- **Tech4EUConstruction cluster:** WP8 will invest specific effort in reinforcing the engagement activities, especially the ones related to the Tech4EUConstruction cluster. More HEurope projects will be invited, and joint dissemination activities, such as promotional campaigns, and the organisation of joint events, workshops and papers, will be reinforced. In addition, the Exploitation managers of each project will also be invited to participate in the cluster meetings to gain knowledge on the exploitation and business developments of each project's main Key Exploitable Results.
- **Emailing campaigns** T8.1 will also schedule email campaigns, when needed, to invite the stakeholders to events, to share HT's key advancements and technologies and to ensure they are aware of what is happening in the project.
- **Social media campaigns and blog posts:** In the coming eighteen months, T8.2 will change a bit the focus: from M1 to M18, the main scope of this activity was to present the project, its partners, the people involved, the goals, and the first

achievements. Since the project is entering a more mature phase, more emphasis will be dedicated to disseminating and promoting the project's technical accomplishments via ad hoc campaigns and blogs, in close collaboration with the technical WPs.

Meetings with the WP leaders will be organised to schedule content creation properly.

- **Newsletters:** from October 2023, quarterly newsletters will be released. In addition, when needed, flash news will be released using the LinkedIn newsletter when important accomplishments are achieved.
- **Increase HT's presence online:** specific effort will be dedicated to reaching an online community of 2000 by the end of the project. In addition, we aim at 400 subscribers to the HT newsletter. To do so, the project will diversify the social media campaigns, amplifying the joint activities with the cluster.

ANNEX A

On June 2023, the Horizon Europe Projects, BEEYONDERS, HumanTech and RoBétArmé, joined forces to create the collaborative cluster "**Tech4EUconstruction**".

Funded by the European Commission, under the call HORIZON-CL4-2021-TWIN-TRANSITION-01-12, the three projects aim to develop and demonstrate new technologies to digitalise further and automatise the European building sector, increasing its safety and attractivity for workers. Furthermore, the cluster seeks to stimulate the EU's sovereignty in the industry, decreasing the need for technological imports.

The members of the Tech4EUconstruction cluster.

BEEYONDERS' core ambition is to address the challenges hampering the EU's competitiveness in the construction sector by producing, commercialising and integrating beyond state-of-the-art solutions into real construction scenarios. The project will extensively use AI, automation, and digitisation.

HumanTech aims to overcome major challenges in the European construction sector by achieving significant advances in cutting-edge technologies. Our objective is to establish a safe, rewarding, and digitally enabled work environment that caters to highly skilled construction workers' and engineers' requirements while enhancing workforce well-being, productivity, and resource efficiency.

RoBétArmé seeks to revolutionise Construction 4.0 by automating labour-intensive tasks in shotcrete application, targeting improved safety, productivity, and sustainability in the construction industry. To this end, the project will deliver a human-robot collaborative construction system for shotcrete digitalisation and automation through advanced perception, cognition, mobility and additive manufacturing skills.

Collaboration framework

The main objective of the Tech4EUconstruction cluster is to share knowledge between the projects on different aspects:

- Mutual exchange of technical expertise and project innovations.
- Implement joint communication campaigns to raise cluster awareness (such as the Words of Innovation campaign on social media.)
- Share knowledge and plans on exploitation actions.
- Mutually promote the projects' main activities and achievements.
- Co-organisation of events, workshops, panels, etc. (such as the AI in Construction workshop at ERF 2023)

Funded by the European Union