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Communication Strategies to Stimulate Conversations about New and Innovative Materials through Future-Oriented Multi-Level Stakeholder Mapping: Focus on transparent wood-based composites

Eva Vanessa Bruno, Doriana Dal Palù, Beatrice Lerma, and Giulio Malucelli

This study is a preliminary activity within the three-year Horizon Europe project AI-TranspWood, and proposes a novel approach for designing communication strategies to promote innovative materials in untapped markets, encouraging conversations among different stakeholders. In particular, this study aims to improve potential new users' adoption of transparent wood-based composites (or Transparent Wood, TW) through a comprehensive and structured communication campaign. Furthermore, this paper aims to improve communication and dissemination of European projects, specifically regarding materials innovations, to society and organisations.

According to the classic stakeholder analysis, the approach is centred on a multi-level stakeholder mapping methodology, which identifies and categorises the various stakeholders involved in the project across different communication engagement levels. The first level identifies each stakeholder's position in a power/interest matrix and identifies their communication goals, needs, and expectations concerning the diffusion of TW. By analysing this first level, the proposed method enables the development of targeted communication strategies that resonate with each audience, according to a communication matrix. The communication media are different, ranging from the most popular (websites, social networks) to the most technical (webinars, documents) ones, and the level of in-depth content differs according to the medium. This analysis

differs from traditional stakeholder analyses from the second level onwards, focusing on predicting and controlling future scenarios. It examines communication on three levels, namely: the current scenario of new materials, their interaction, and the communication context. Through Visioning methodologies, it imagines these levels in the near future, where the new media will be totally disruptive.

This designed framework aims to facilitate the successful adoption and diffusion of innovative materials in unexplored markets in the widest context of the materials systems. The effectiveness of the multi-level stakeholder mapping approach will be validated in January 2025 through quantitative analysis of stakeholder interactions on social media and downloading content from the website; results will be discussed in a focus group among project stakeholders in June 2025.

KEYWORDS: transparent wood, spreading innovation, academic communication, holistic communication, visioning process

RSD TOPIC(S): Mapping & Modelling, Methods & Methodology, Society & Culture

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Introduction

The importance of communication and dissemination in EU projects

Sharing academic research findings about new and innovative materials with society and organisations is more than acknowledging the effort of lab-scale experiments. Facilitating conversations between policymakers, industry professionals, and the public can help achieve the goal of maximising the research's impact and translating it into real-world improvements[1].

Cortiñas and Alonso (2014) highlight an interesting paradox: even as science advances and plays an increasingly crucial role in society, it receives less coverage in traditional media outlets. This decline in science journalism could reduce public understanding of

[1] European Commission - Dissemination and exploitation of research results. https://research-and-innovation.ec.europa.eu/strategy/dissemination-and-exploitation-research-results_en

scientific developments. In response to this trend, the European Union has prioritised disseminating scientific knowledge, recognising the importance of informing the public about scientific progress and its implications.

Recently, the scientific literature has pointed out how public engagement should be regarded as itself a form of impact (Fogg-Rogers et al., 2015). The concluded EU's funding programme Horizon 2020 highlighted this clearly: communication, dissemination, and exploitation of results demonstrated their capability to multiply the impact of public investment (Campos & Codina, 2021); the connections within the Plan for Exploitation and Dissemination of Results (PEDR) and the communication strategies to reach different interest groups had to be strong, also through the web and social media (Gertrudix et al., 2021); further, targeting stakeholders in the quadruple helix was assumed as an ultimate goal (Magalhães et al., 2022).

However, beyond publishing academic articles, most efforts to disseminate academic research appear to be carried out without a formal plan (Wilson et al., 2010a). On the other hand, researchers have various theoretical frameworks for guiding planning and dissemination activities. These frameworks are based on different theoretical approaches, including persuasive communication, diffusion of innovations theory, and social marketing (Wilson et al., 2010b). However, what defines successful dissemination in terms of impact and return on investment is still unclear (Wilson et al., 2010a), especially for what concerns constructed environments, objects, and materials systems.

The adoption of new and innovative materials towards a green transition

Safe and Sustainable-by-Design (SSbD) aims to integrate safety and sustainability as early as possible in the innovation process and throughout the entire product lifecycle (Sudheshwar et al., 2024; European Commission, 2020). The European Commission’s Chemicals Strategy for Sustainability developed a framework for the definition of criteria for Safe and Sustainable-by-Design chemicals and materials to guide companies’ innovation towards a green industrial transition and, consequently, to minimise impact on human health, climate, and the environment (Caldeira et al., 2023), The first phase of the framework is defined as a (re)design phase, in which design-guiding principles and indicators are proposed to support the design of materials.

In the current polycrisis world, new and innovative materials, indeed, could be developed to be more safe and sustainable for people and environment: as underlined by many experts (Rognoli, 2010; Karana et al., 2008; Bak-Andersen, 2018) in the last decade, materials can define better performances and add meaning to the artefact; moreover, materials can revitalise design, create new business opportunities, transform industrial activities, and conceive innovative and sustainable solutions (Bak-Andersen, 2018).

A design-driven method in developing, producing, and using new sustainable materials can have a huge impact in strengthening the competitiveness and success of creative industries linked to manufacturing (from automotive to jewellery, from architecture to lighting sectors, etc) (Aversa et al., 2016). Finally, the adoption of sustainable materials for product manufacturing by large-scale businesses can encourage consumers to new forms of consumption, as well as to change their behaviour. All these exnovation, i.e. eliminating what is no longer effective or has become obsolete, can - and must - be strengthened through correct communication strategies.

The AI-TranspWood project

The so-called transparent wood-based composite (or Transparent Wood, TW) is an innovative material among the currently most promising, which emerged as innovative in the last 15 years, with potential applications as an effective substitute for plastics and glass in various industrial sectors (i.e., construction, automotive, electronics, and interior design, among others), with a potentially important role in sustainability (Mariani & Malucelli, 2022).

To best develop the potential of this material, usually obtained by removing lignin from wood, an international consortium of universities, research centres, and companies is participating in the three-year HE project titled "*AI-TranspWood. AI-driven multiscale methodology to develop Transparent Wood as sustainable functional material*"[2].

AI-TranspWood aims to create a multiscale methodology based on artificial intelligence (AI) for the design and production of new wood-based functional composites within the European Union's "Safe and Sustainable-by-Design" (SSbD) framework. SSbD tools,

[2] www.ai-transpwood-project.e,,ofu

together with new transparent wood-based materials, will increase the innovation capacity of SMEs and industry towards the design and development of future sustainable products. It can considerably increase Europe's share in the global production of sustainable, transparent wood-based composites.

However, to disseminate the knowledge generated by this research, communicate the results, and involve stakeholders in the processes of adopting this new material, a specific dissemination and communication plan is strongly necessary.

A research group of the Politecnico di Torino, composed of experts in the fields of materials science and product design, is included in this project as leader of the Dissemination and Communication work packages (WPs). The overall objective of these WPs is to optimally organise, guide and monitor the communication and dissemination of AI-TranspWood results, in a structured, resource-efficient way and in synergy with the activities implemented in all the other WPs.

Fostering the adoption of new and innovative materials through a communication strategy

This paper aims to improve communication and dissemination of European projects, specifically regarding material innovations, to European citizens, researchers, and the industry world. The research aims to find practical communication approaches that can encourage stakeholders to engage in conversations and support the adoption of innovative materials in the constructed environment, with a particular focus on transparent wood-based composites.

To do this, research is structured around the main research question (Main RQ): *How to enhance the communication and dissemination of new and innovative materials not yet on the market within European projects?*

Accordingly, specifically (RQ1): *What technologies and tools can researchers in Design identify to widely communicate results and impacts to foster the adoption of transparent wood-based composites?*

Theoretical Framework

A future-oriented multi-level stakeholder analysis

This research aims to identify communication strategies to stimulate the stakeholder conversation about new and innovative materials. It seeks to answer the questions by structuring a multi-level analysis of stakeholders involved and to be involved in the future. Indeed, as underlined by Riahi (2017, p.41), “the finished product of a stakeholder analysis is a communication plan that is a part of the full project plan”.

- Stakeholder Analysis is a range of techniques and tools for identifying and understanding the needs and expectations of key stakeholders inside and outside the project environment (Smith, 2000).

However, this contribution expands the analysis to different levels and timeframes. To achieve this, the research employs:

- Visioning tool (Hekkert & van Dijk, 2016), which not only enhances the traditional Stakeholder Analysis, but also provides ideas for achieving future visions.

Stakeholder analysis in design discipline and practice

Stakeholder Analysis is a set of tools used to identify, understand the interests, the level of impact of the people (or groups) affected by or able to influence the project (Riahi, 2017; Smith, 2000). Its composition continues to evolve, and it is commonly used by project managers in a way that optimises results and minimises the negative impact. Stakeholder Analysis emerged gradually, starting from the 1980s in the fields of management, business administration, health management, etc. Indeed, due to its usefulness and versatility, it is used in various research fields, even design and its subdomain, where new verbs, such as *map* and *engage*, are also employed for describing the different purposes of Stakeholder Analysis. For example, in Interaction Design, Stakeholder Analysis is critical for user-centred research projects, as stakeholders can help ensure that the conducted research is as relevant as possible to the project, and thereby support designers. Consequently, designers can create solutions tailored to their target audience's needs, which can ultimately lead to greater user satisfaction and the project's success (Interaction Design Foundation - IxDF, 2023). The Interaction Design Foundation offers a template for mapping stakeholders based

on their power and interest in a project, which is one of the first steps for performing a Stakeholder Analysis (Dam et al., 2022). The subdomain of Systemic Design also has its own approach to Stakeholder Analysis. Systemic Design analyses stakeholders to create cooperation (Giraldo Nohra et al., 2020), multi-stakeholder networks (Pereno & Barbero, 2020) and thus material, financial, and information flows (Vezzoli et al., 2018). Moreover, Strategic Design uses Stakeholder Analysis to encourage co-design and collaboration towards the achievement of a common goal while creating the highest possible value for stakeholders (Meroni, 2008). In this approach, stakeholders are actively engaged in shaping strategic decisions within the organisation (Calabretta, 2016). However, this research fits more in the subdomain of Communication Design, as stakeholder engagement is considered "an ongoing matter of communication design" (Aakhus & Bzdak, 2015, p.188). Reaching different stakeholders, very different from each other in terms of characteristics, needs, levels of power and influences, and expectations about the project, is a challenge in which the practice of Communication Design, with its design principles, provides an approach to improving communication competence.

Visioning in design

As anticipated, this research expands the levels of stakeholder reading, particularly a reading based on the present, to hypothesise a near future. Design has always had a temporal dimension that involves studying the past, observing the present, and imagining the future. However, in recent decades, there has been a growing emphasis on *futuristic design*, which goes beyond simply solving current problems and seeks to imagine and create products, services and systems for a future yet to come. As a result, new future-oriented Design subdomains with their theoretical foundation and tools have been formalised, such as Design Fiction (Sterling, 2005), Advanced Design (Celi, 2015), Future studies and Anticipations (Poli, 2019), Exploring Design (Germak & De Giorgi, 2008; Lerma et al., 2015), Speculative Design (Dunne & Raby, 2024), Critical Design (Lindley & Coulton, 2015; Dunne & Raby, 2024). In these practices, design is viewed as a tool for creating ideas rather than just objects that are ready for commercial use.

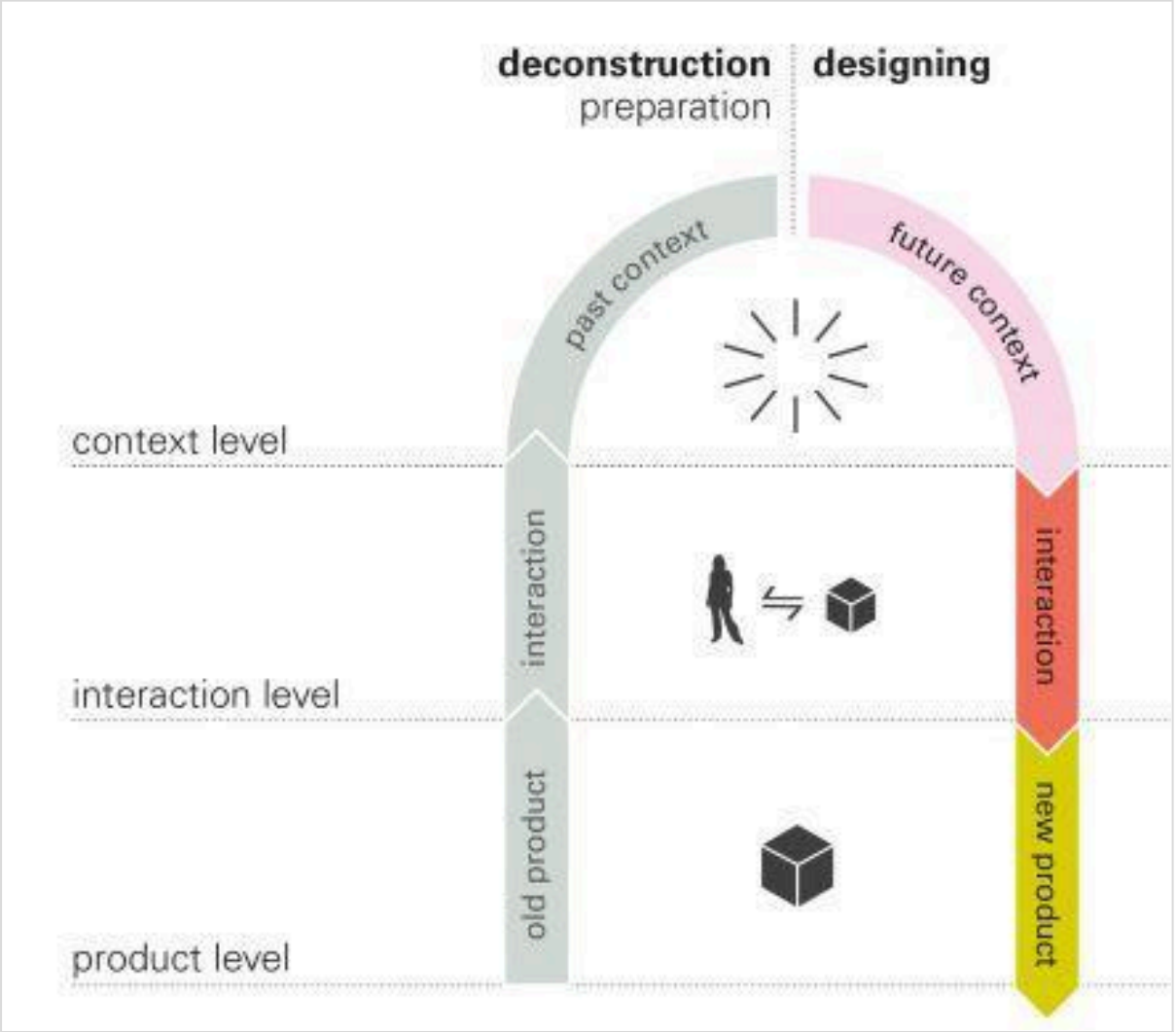

Figure 1. ViP methodology. Source: Hekkert & van Dijk, 2016.

Within the outlined framework, the Reframing Method developed at TU Delft[3] in 2016 is of outstanding importance (Hekkert & van Dijk, 2016). It is built upon three core principles: being future-oriented, designing for impact and promoting responsible change. This approach emphasises the importance of anticipating changes in people's lives in the future while considering the design process that takes into account the social, moral, and ecological impacts of the project.

[3] Technische Universiteit (TU) Delft

The Reframing Method creates a frame of reference for future product development, through ViP, which stands for "Vision in Product Design", a tool and a process of innovation that helps identify a product's purpose, its *raison d'être*. "Product" means anything that can be deconstructed, such as communication, service, game, or strategy (Hekkert & van Dijk, 2016).

The novelty in this contribution is to combine Stakeholder Analysis with Visioning in Design, to engage TW stakeholders and stimulate conversations through new and unconventional media, technologies and tools.

Mapping the Stakeholders: The twofold adopted approach

The next sections describe the procedure of using the two methods introduced above, and the results achieved.

The stakeholder analysis process

For this section, the method described by Smith was adopted (Smith, 2000). The Stakeholder Analysis must be carried out at the start of the project and reviewed regularly as the project progresses. Generally, the Stakeholder Analysis is divided into four main steps: identification, prioritisation, understanding, and communication.

The initial stage concerns *identification*, categorising the stakeholders involved in the project as internal or external.

As shown in Fig. 2, in the AI-TranspWood project, two typologies of stakeholders (internal and external) were identified, subdivided into six macro-groups (represented with the dark blue circles):

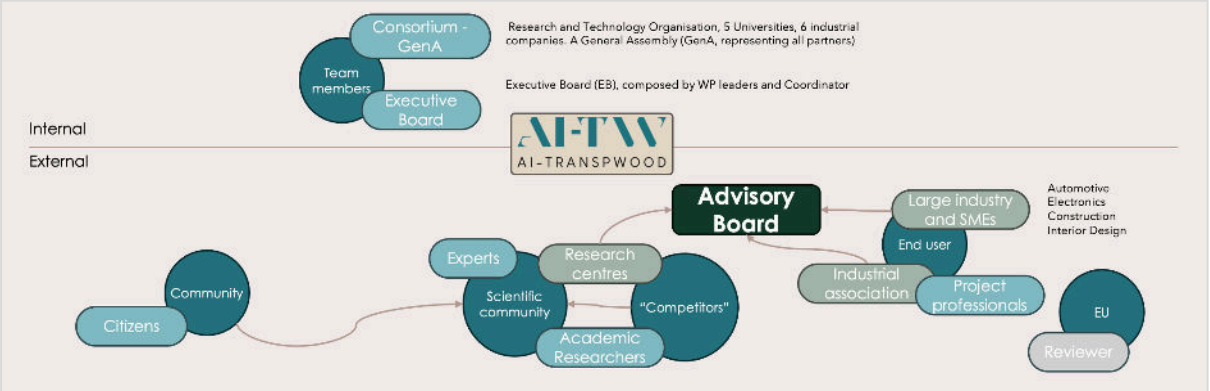

Figure 2. Stakeholder mapping. Source: Authors.

- Internal stakeholders: i. team members (i.e., Consortium and the Executive Board).
- External stakeholders: ii. the European community (Citizens); iii. the scientific community (Experts, Research Centres and Academic Researchers); iv. competitors (such as other researchers and research centres); v. end-users (i.e. Industrial Associations, Large industry and SMEs, and Project Professionals); vi. the European Commission, as the project's funding agency.

Excluding the European Commission, which is not the main target of the communication campaign, for a more detailed analysis, we defined nine sub-groups of stakeholders (represented with the light blue circles), with a specific attention to the application fields addressed in the project (automotive, electronics, construction, and interior design).

The second step concerns *prioritisation* (fig. 3), grouping the nine sub-groups of stakeholders in the Power/Interest Matrix, according to their level of influence and interest in the project. To do this, each stakeholder was given a score (0-10) to assign a level of interest/power, which equals the sum of the two respective scores.

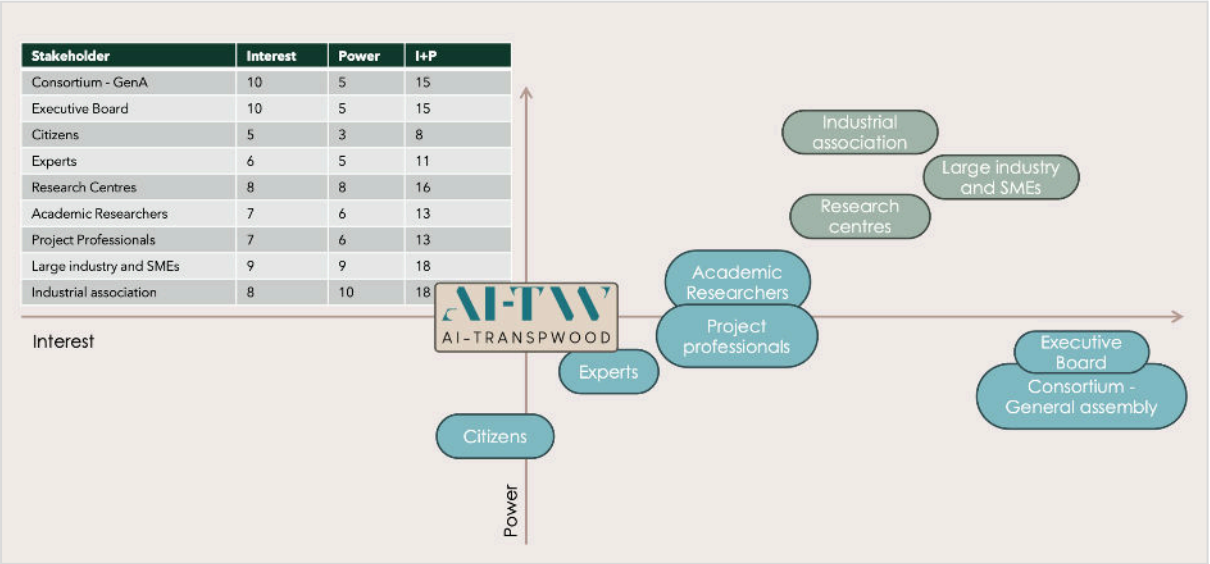

Figure 3. Power/Interest Matrix for prioritising stakeholders. Source: Authors.

The third step involves *understanding* (fig. 4) the needs and expectations of stakeholders; this might involve interviews, surveys, or focus groups that will be performed in the next months, according to the project timetable. Therefore, this preliminary analysis hypothesises, through the use of the personas model[4] (Interaction Design Foundation - IxDF, 2016), stakeholders' needs and expectations, according to the communication goals related to each stakeholder.

Indeed, by detailing the communication goals, it became clearer to define the needs and expectations of the stakeholders, in relation to content, form and communication media. It is interesting to note how the linguistic register will change depending on the stakeholder: for example, more descriptive texts will be used for less experienced stakeholders; more argumentative texts will be employed for more experienced ones; narrative and persuasive texts will be used for those unfamiliar with the project (Werlich, 1982).

[4] fictional characters to represent the different user or consumer types.

Figure 4. Goal, stakeholder needs and expectations regarding communication. Source: Authors.

The final analysis stage involves strategic *communication* planning, which includes matching stakeholders with appropriate communication channels (media), creating a communication matrix. To reach the wide variety of stakeholders, the chosen communication channels for dissemination include newsletters and social media networks (i.e., LinkedIn, X, Facebook, and Instagram), dissemination events such as conferences, webinars, and seminars, trade fairs, and branding activities focusing on corporate image. As shown in Figure 5, the pairings have been defined. Stakeholders are listed in order of scoring interest and power, in accordance with the Power-Interest Matrix, while the media order takes into account the level of scientific and narrative descriptive language.

It is worth noticing that stakeholders exhibiting a high level of power and interest require communication tools that use a moderate level of scientific language and favour narrative/descriptive content. On the other hand, stakeholders with low power-interest scores tend to use more complex communication tools, such as scientific publications. Additionally, it is interesting to observe that these communication tools are not limited to the usual pairings, such as citizens' social networks.

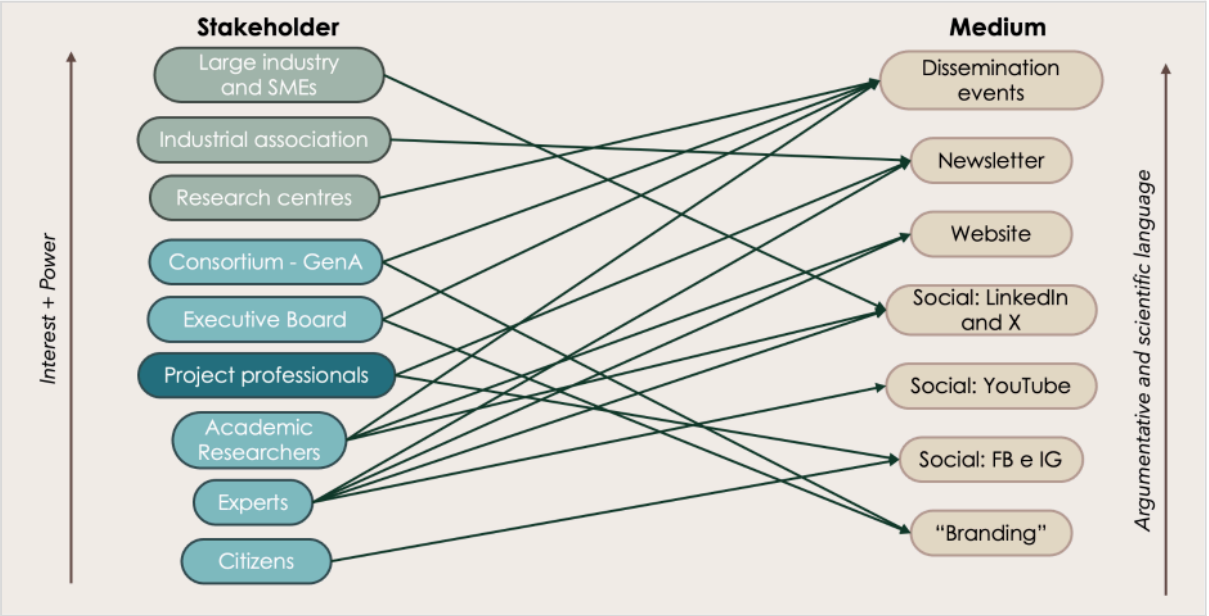

Figure 5. Communication matrix. Source: Authors.

The Visioning process

In the second part of the analysis, the Vision in Design operational tool is used.

The ViP tool consists of two phases: deconstruction (i.e., project preparation, the past) and designing (i.e., the future). Each phase is divided into three levels, namely: the product level, interaction level, and context level. The deconstruction phase involves analysing the product's current state, including its production process, purpose, how people interact with it, and the worldview that influenced its design. This information is used in the Reframing Method to identify the past context. The designing phase defines the future context, the new interactions, and finally the new concept according to a new vision.

ViP has been selected as the preferred tool for this second part of the stakeholder analysis since it can analyse the current state of traditional materials and communication tools used by stakeholders. ViP can assist in analysing the same levels for transparent wood and identify new communication tools to facilitate stakeholder engagement. The expected outcome of this research is to identify a new communication vision and recommend new tools that can improve conversation among stakeholders, alongside the communication strategies already pointed out in the project.

According to the developers of ViP, everything that can be designed and deconstructed can be included in the “product level”. Therefore, communicative media is considered at the product level.

The procedure starts from the bottom level of the deconstruction phase, which contains the communicative media of the past (i.e., the *communication matrix*).

The research proceeds upwards to the second level, which focuses on *interactions*. This involves conducting a material workshop to identify how individuals perceived and experience interactions with transparent materials and wood in the past. This will be followed by designing interactions with transparent wood for the future. The procedure continues with the third level, the past and future *context*. This will be explored through field research, and in particular through two focus groups.

The research's first tangible and useful results, and the last level of ViP that covers communication media in the future, will be detailed in the following section. These results emphasise the importance of adopting a more comprehensive and systemic approach to the communication strategy, which organises the current communication channels and tools with stakeholders.

Results obtained from the future-oriented multilevel analysis: insights for bridging stakeholders through conversations

The following section describes a set of new communication media through a brief description and use cases, which, in the near future, may complement the current traditional ones. Similar to the communication media commonly used in the past, the stakeholders are ranked in order of power and interest in the first column. New communication channels to be exploited in the second column are listed.

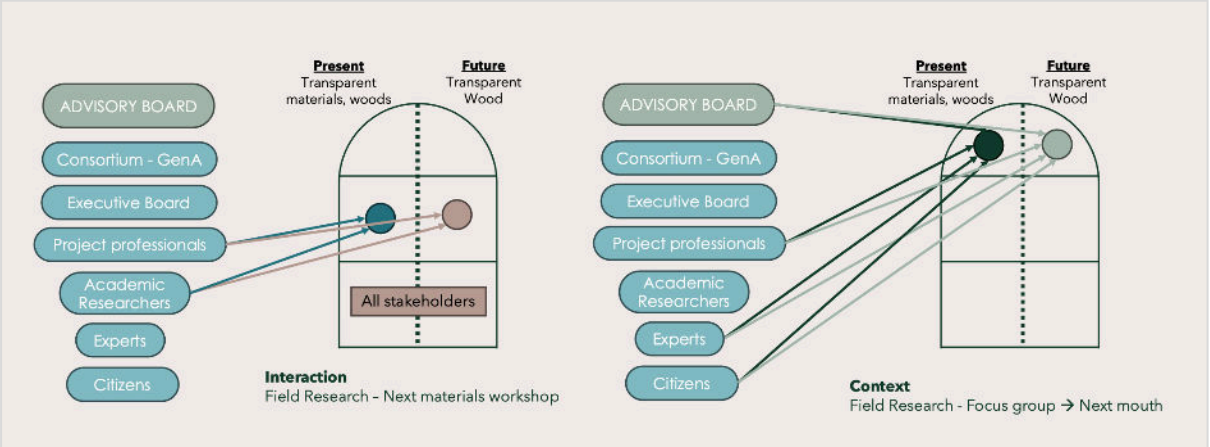

Figure 6. Stakeholders involved in the Interaction and context levels. Source: Authors.

These technologies and their applications are a direct response to RQ1.

The new communication tools identified are:

- **Web3**, the future of the web, is distinguished by its decentralisation, user data ownership, and blockchain technology. The **metaverse**, a shared 3D virtual space, offers a unique platform for interaction, socialisation, and activities. Integrating Web3 and the metaverse can create new forms of online communication and communities and fundamentally alter the current interactions. The META[5] company provides access to the metaverse through virtual reality, augmented reality, and smart glasses. For the AI-TranspWood project, the metaverse can be used to provide additional technical information in the immersive spaces provided by the metaverse.

[5] https://about.meta.com/metaverse

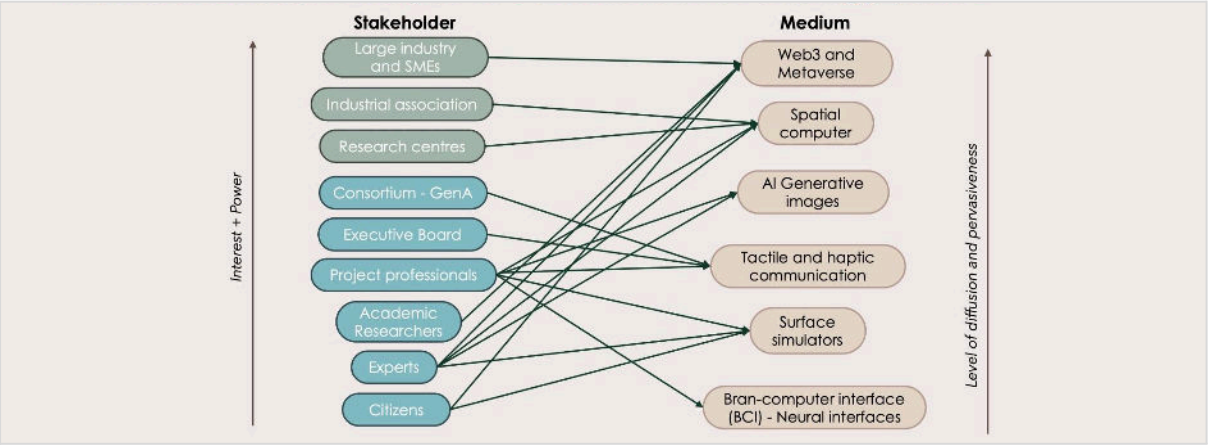

Figure 7. Communication matrix (future context). Source: Authors.

- **Image generation technology** such as Dall•E makes it possible to create photorealistic images from simple text descriptions. These systems exploit machine learning models trained on huge datasets of images and text. Artificial intelligence is able to analyse the textual description, identify key concepts, spatial relationships and stylistic features and then generate a corresponding image. For the AI-TranspWood project, this technology would allow visionary images to be generated, making renderings of the material (and products made in TW) to test the material's appreciation even before having laboratory prototypes.
- **Surface simulators:** 3D viewing platforms and software (i.e. Vortek Space[6] by Arcane Technologies) for reality and interactive 3D visualisations. They offer the possibility of truly perceiving space, exploring interior designs and imagining the surface materials, via the screen of devices such as tablets. For the AI-TranspWood project, this technology would enable civil society to imagine itself in new spaces where elements are made up of TW.
- **Haptic communication** focuses on the transmission of information through touch, providing physical feedback to digital interactions. Such technologies as haptic feedback in mobile devices and haptic gloves can improve communication among stakeholders and distant artefacts by making it more realistic, engaging, and accessible. For the AI-TranspWood project, this technology would make it

[6] https://vortekspaces.com/

possible to create new digital catalogues that can be shared and shipped quickly and anywhere.

- **Neural interfaces** (or BCI - Brain Computer Interface) aim to directly connect the human brain to computers; BCIs could revolutionise digital communication and interaction methods by making it possible to type text with thought, control virtual devices with the mind, and share direct sensory experiences. Neuralink[7], a neuro-technology company founded by Elon Musk, is working on this through clinical trials. For the AI-TranspWood projects, this technology would allow a kind of immediate, unconscious, and spontaneous visualisation of perceptions, which can give rise, for example, to sensory moodboards.

The proposed ideas follow the logic of hyper-personalised communication, which exploits real-time data and artificial intelligence to create highly personalised and relevant communication experiences for each stakeholder, adapting their needs to the proposed contents. Even if these are only hypotheses, anticipating communication trends by identifying future media helps academia adapt and keep up with non-scientific communication channels.

Different stakeholders mean different needs, which can be achieved through various media and communication channels, but above all, through personalised actions, tools, and streams of information. The new technologies mentioned before allow reaching many typologies of users and introducing them in a systemic way (also through virtual reality) to new materials, their properties and characteristics, both physico-chemical-mechanical and sensorial-expressive: in other words, it is possible to foster dialogues between large-scale businesses, organisations, and society, and maximise the research's effect and diffusion of results.

The main challenge will be communicating the concept of Transparent Wood, which does not exist yet, and creating a virtual experience of this material. To aid in this, providing 3D-printed samples using clear resin to simulate Transparent Wood's optical and tactile properties would be helpful.

[7] https://neuralink.com/

Discussion

The structuring of the twofold methodological approach answers the main research question concerning the enhancement of communication and dissemination of new and innovative materials not yet on the market, constantly developed within European research projects. Within this context, the technologies identified to support, in the near future, the communication of results and impacts to facilitate stakeholder adoption of transparent wood-based composites are the primary results that respond to RQ1.

These results emphasise the importance of adopting a more comprehensive and systemic approach to the communication and dissemination strategy of research projects. Currently, research projects use multiple media (i.e., social networks, websites, etc.) to communicate and disseminate results and impacts reaching different stakeholders. This diversification of media, in addition to writing papers and attending conferences, brings positive, but more importantly systemic, results. For instance, recent research provides a quantitative explanation of the mutually beneficial nature of social networks. Specifically, Klar (Klar et al., 2020), by comparing tweets and citation patterns, showed that scholars can actively promote their research on Twitter (now X). This shifts the dynamics of dissemination from push to pull, allowing researchers to take a more proactive role in sharing their work rather than relying solely on others to discover it in academic publications. This change creates a bottom-up demand for new consumption, leading to an approach of exnovation rather than innovation. Although the present communication system is structured and shared, new ways for conversation can be implemented to encourage the adoption of new and innovative materials, especially through materiality, sensorial aspects, and visions of new applications (Burchill, 2020). This issue prompts researchers to adopt a circular approach to information, allowing stakeholders to connect through new communication and engagement methods while showing "what does not yet exist."

Although certain technologies have been around for a few years now, they have not yet reached a high level of diffusion; following the Rogers curve (Rogers, 1962), such technologies as haptic communication or metaverse have so far only reached early adopters, i.e., those enthusiastic about new products, services or technologies just before their mass diffusion. Other technologies like the Brain Computer Interface are

still in their infancy and in the process of improvement, and their large-scale diffusion in the coming years is still uncertain. However, within research projects concerning new and innovative materials, these new technologies and their applications could have strong impacts on the community, comprising citizens, project professionals and industries. This is because, compared to traditional media, the identified technologies can be able to communicate all those sensory, perceptual aspects in a more interactive, proactive, and engaging way that a static photo and text cannot provide.

The AI-TranspWood research project will be informed by this multilevel stakeholder analysis. The editorial plan could be enriched and inspired by adapting the content, language and media according to the stakeholders involved. Furthermore, it could integrate the identified new technologies and media targeting current early adopters.

In addition to the establishment of an enriched communication plan, the European project case study presented here can be useful to the scientific community of designers as a best practice for triggering new practices, i.e ways to communicate and information about innovative materials using the identified technologies.

Conclusion

The research used a twofold approach to map stakeholders around the AI-TranspWood project and to identify current and future communication media. The novelty in this contribution is to combine Stakeholder Analysis with the ViP methodology that focuses on deconstructing the present and imagining future contexts. This combination of methods made it possible to:

- Renew the classic Stakeholder Analysis with a new approach, enriching and updating the dialogue around this method.
- Identify new ways of communicating the results of European projects to stakeholders of the material system, contributing to the search for effective methods and tools to increase the dissemination of EU-funded research projects.

This result aligns with the Quadruple Helix Model of innovation that recognises four major actors in the innovation system: Academia, Government, Industry, and Civil society. However, for now, the research and its results affect three out of four

stakeholders; stakeholders related to the government have not been taken into account so far, which is the main limitation of the research.

These findings may have policy implications; indeed, they can be incorporated into the ecosystem of tools and practices provided by the European Union[8] (guidelines, explanatory webinars, guides), which currently focus on the tools available in the present.

To validate the effectiveness of the twofold approach, stakeholder interactions on social media and website views will be quantitatively analysed from January 2025 onwards. These first data may confirm the effectiveness of *push* dissemination, using traditional communication media. The new technologies and media identified will be discussed by the project stakeholders in a focus group in June 2025. This focus group will confirm or modify the needs and expectations identified through the personas model; subsequently, a new editorial plan for the AI-TranspWood project can be planned, integrating the new technologies and communication media identified. The goal is to transition from one-way communication to a more interactive and engaging approach that provides information and actively involves the target audience.

What is needed now is a qualitative study to gauge the acceptance of new technologies identified by project stakeholders. The study should involve tools such as the Technology Acceptance Model (TAM) to determine the behavioural intention and propensity to adopt these technologies (Davis, 1989). Based on the findings, the project team can calibrate its efforts and allocate resources towards the new communication channels appropriately.

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