Listen2Future

D7.3

Communication, Dissemination, Market & Stakeholder Plan

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Acoustic sensor solutions integrated with digital technologies as key enablers for emerging applications fostering society 5.0.

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Publishable Executive Summary

The present document is deliverable D7.3_Communication, Dissemination, Market & Stakeholder Plan (CDMSP) of the Listen2Future project. Listen2Future is co-funded by the Key Digital Technologies Joint Undertaking (KDT JU) under grant agreement No. 101096884, and JU Member States.

The main objective of the respected activities, lead by the UGR-Spain, is to ensure the visibility of the Listen2Future project and the communication & dissemination of public project deliverables, progress and results among the targeted groups. This dissemination effort will be conducted through very well-organized activities in order to ensure that the results of the project are sustainable after the end of the project.

The Listen2Future CDMSP has been created by the projects dissemination & communication team in order to maximize the transfer of the results achieved, ensuring that it reaches the largest possible number of relevant stakeholders and society in general through the cooperative effort of all Listen2Future partners. This plan is the corner stone of the communication and dissemination strategy bringing together knowledge, experience and best practices when selecting the appropriate tools, activities and timelines. This includes, in particular, the following aspects:

- The definition and description of target groups and communication channels
- Tools utilised for dissemination and communication of project results
- Plans for communication and dissemination events
- Dissemination and communication activities' tracking methodology and tools
- Listen2Future brand identity

The framework for the activities consists of the legal documents including Project Grant Agreement (PGA), Project Consortium Agreement (PCA), and National Grant Agreements (NGA) and from this CDMSP document. This document complements the legal documents by a description of the project-wide dissemination and communication processes, rules and tools to be applied throughout the project. This document is thus a reference document collecting all project dissemination, and communication elements.

The Listen2future project's CDMSP is a living document that will be regularly reviewed and updated at the general assembly meetings, respectively according to the needs. Final outcomes will be presented in D7.4 at the end of the project.

Key Words

Dissemination, Communication, Sustainability, Objectives, Market, Stakeholders

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1 Introduction

1.1 About MEMS

Micro Electro Mechanical Systems (MEMS) are devices that combine electrical and mechanical components on a microscopic scale. These miniature systems have revolutionized a wide range of fields, including biomedical, digital industry, and energy.

In the biomedical field, MEMS are significantly contributing to the development of miniaturized medical devices and aids, to development of efficient diagnostic tools and are also opening novel medical treatment possibilities. MEMS-based sensors can be used to monitor vital signs, detect the presence of infection in the body and for imaging. MEMS-based drug delivery systems can be used to precisely control the release of medications and ensure that they are delivered directly to the target site, minimizing side effects (not directly addressed in Listen2Future use cases demonstration).

In the digital industry, MEMS are used in a variety of applications, from consumer electronics to industrial automation. MEMS-based sensors are used in smartphones and wearables to enable features such as motion sensing, environmental monitoring, and GPS tracking. MEMS-based microphones and speakers are used in a range of devices, from smartphones to hearing aids, and MEMS-based proximity sensors are already used in applications such as robotics and other automation applications.

In the energy sector, MEMS are used to improve the efficiency and performance of a wide range of devices. MEMS-based sensors can be used to monitor the performance of these devices in real time, enabling operators to optimize their operation and reduce maintenance costs. MEMS-based energy harvesters can be used to generate electricity from sources such as ambient vibrations or thermal gradients, and MEMS-based microfluidic devices can be used to improve the efficiency of fuel cells and other energy conversion systems (not directly addressed in Listen2Future use cases demonstrations).

Overall, MEMS technology has had a transformative impact on a wide range of industries, enabling the development of smaller, more efficient, and more capable devices in the biomedical, digital, and energy sectors. Europe already occupies a leading position in MEMS sensors, with a global market share of more than 40 percent. The results from this research project will further strengthen the market position of European companies.

Listen2Future will develop acoustic MEMS transducer concepts building on new generation of piezoelectric transducers (piezoelectric ultrasound transducer and piezoelectric microphones), an intelligent signal processing system, algorithms and customized packaging for performant, miniaturized and power/cost-saving systems. Our mission is to pave the way for MEMS piezoelectric acoustic transducers based on novel thin-film materials and technologies to high volume production by enhancing European industrial leadership throughout the value chain.

1.2 Listen2Future: an opportunity to improve

Medical care, healthy aging, energy security and production quality are fundamental issues for our society. As sensory organs of technology, tiny sensors such as microphones and ultrasonic sensors play an important role in this. As a “digital ear”, they record acoustic signals and allow rapid investigations. The research of “Listen2Future” will significantly improve the

performance of existing systems and also produce completely new solutions (first-of-the-kind) that benefit society, people and health.

Digital innovations for industry and medicine

The aim is to bring the smallest micro-electro-mechanical sensors, or “MEMS sensors” for short, into high volume production at globally competitive costs and make them available for a wide range of applications for industry and medicine. The research will yield higher image resolutions in ultrasound probes, robust mini-hearing aids with first-class sound quality and low energy consumption. The focus will also be on wearable ultrasound patches for early detection of heart disease, for example, and ultrasound devices for rapid serous infection control in infants. In industry, between others, continuous quality control of materials and intelligent monitoring of the energy infrastructure, intelligent gas sensors, indoor navigation and activity monitoring, are to be implemented.

New generation of transducers

The team is working on small, piezoelectric ultrasonic sensors and microphones-based sensor solutions and demonstration. Research is ongoing across the entire supply chain - from materials, design, signal processing, assembly and packaging technologies, software developments and artificial intelligence algorithms to miniaturized system solutions that can be integrated. This is the key for Europe’s digital sovereignty and its capacity to produce high-quality sensor solutions which are topics addressed by KDT JU program.

1.3 Concrete areas of application

Mini hearing aids that consume less power and more robust ear probes

Around 34 million people in Europe live with impaired hearing, but only about one in three of those affected receives professional support and uses hearing aids. Smaller and easy-to-use hearing aids would significantly increase acceptance and improve healthcare. Advancements in MEMS piezoelectric microphones are expected to enable the smallest, most robust, waterproof designs and reduce power consumption by more than 15 percent through more energy efficient technology. User comfort will be improved and hearing aid battery life extended.

Another application that can profit from more robust, smaller, cheaper and performant microphones are ear probes for objective audiometry. Ear probes are an essential tool in both new-borns hearing screening and diagnostic audiology for the differential diagnosis of hearing conditions.

Precise ultrasound for infants detects infections

Novel miniaturized ultrasound probes enable the diagnosis of infections and life-threatening diseases in infants, such as meningitis, quickly, easily, painlessly and non-invasively. Highly integrated and cost-effective MEMS technologies from the “Listen2 Future” project also make the devices affordable for widespread use, such as outside the hospital and in developing countries. The research results can help to further reduce neonatal mortality rates in developing countries.

Portable patch for heart control and improved ultrasound probes

The project is also expected to significantly advance the development of flexible ultrasound patches. Wearable ultrasound patches will enable continuous and non-invasive cardiac

monitoring, for example to check cardiac output, insufficiencies and pump volume. In the future, patients would be able to continuously monitor their cardiac performance painlessly from home with the patch attached to their chest. Doctors will receive more information for better medical treatment and hospital stays will be reduced.

As ultrasound imaging is non-ionizing, safe, ultrasound probes have become broadly used for medical diagnostic or procedural guidance. In Listen2Future we will develop development advanced ultrasound probe by integration of high-performance piezoelectric micromachined ultrasonic transducers and read-out electronics.

Ultrasound in cancer or cancer treatment side-effects therapy

Mechanotherapy is dealing with remotely impacting cancer cell phenotype via mechanical waves to fight cancer. The effect of shear mechanical waves of specific frequencies and amplitudes with new Listen2Future technology will be investigated in promoting or suppressing cancer cell proliferation. Furthermore, it will be investigated how to stimulate hair recovery through stem-cell mechanotransduction remotely with ultrasonic compressional and shear waves in women undergoing cancer therapy and suffering from the hair loss.

Monitoring of composite materials and power networks, gas sensors

Integrable systems for continuous material and quality control are getting a new boost from research. Listen2future will demonstrate in an industrial environment the feasibility of using liquid-coupled MEMS technology for non-destructive testing of composite materials for aerospace components. Furthermore, the ultrasound will be used for non-contact, in-line quality and non-destructive test system for various porous materials.

In power networks new acoustic (ultrasonic) sensors (IoT devices in a view of system architecture) will be combined in a distributed network to detect unwanted events in the distribution network (e.g., electrical power grid). This will impact the maintenance quality, productivity and finally costs.

Improved MEMS ultrasonic transducer will be also used to create gas-flow sensor capable to measure not just the volume but also the quality of the gasses. This information is necessary for optimization of industrial manufacture processes, respectively to save the energy by optimize burning processes according to the additional acquitted information.

Activity detection, proximity sensing, indoor navigation

Advanced piezoelectric ultrasound transducers will be also used to realise small size industrial proximity sensors with high spatial resolution. It is expected that Listen2Future transducers, in combination with novel packaging, electronics and software, a significant value to industrial high-resolution proximity sensors can be added targeting a high-volume market.

Listen2future technology potentials will be also evaluated in indoor navigation to create indoor maps and support navigation services in complex buildings.

Finally, a system for detection & classification of human activities based on a mesh of smart ultrasound-based Listen2Future sensors will be created and demonstrated. This sensor is intended used in smart house systems and can be, between others, also used for monitoring of elderly people at home for detection of falls or other irregularities.

1.4 Listen2Future background

Acoustic transducer solutions integrated with digital technologies as key enablers for emerging applications fostering Society 5.0 (Listen2Future) brings European Union member countries

together to strengthen and unleash the potential of digital MEMS (Micro Electro Mechanical Systems) transducer technologies in the European ECS industry to address the emerging needs of Society 5.0 in Health & Wellbeing and in Digital Industry & Energy. Listen2Future started in February 2023 and its implementation will last for 36 months. Being one of the first European initiative in the field, Listen2Future will pave the way to Society 5.0 through our technical and application-level innovations.

Coordinated by Infineon Austria, Listen2Future brings together 27 European associated partners from 7 countries to ensure that the project is strategically connected to the global challenges and developments in the digital MEMS transducer technologies. The partners come from the public and private sector with several different fields of expertise from equipment research, process innovation, technology, assembly innovation and reliability research, up to various application domains representing enhanced smart systems.

Listen2Future is co-founded by the KDT Joint Undertaking (JU) and the KDT participating states: Austria, Belgium, Czech Republic, Germany, Netherlands, Norway and Spain. The JU receives support from the European Union's Horizon Europe research and innovation programme. All the partners are already involved in the field of MEMS transducers and have the capacity to run the activities foreseen in this project.

1.4.1 A global challenge requires a coordinated global response

Our society is undergoing drastic changes as it is facing many new challenges: environmental issues, aging population, increased need for energy and food, severe international competition, growing wealth, and regional inequality, etc. In Listen2Future we have identified a strong potential of MEMS acoustic transducers integrated with digital technologies that support or enable the goals of Society 5.0 through our technical and application-level innovations.

The project builds on the existing competence of the European ECS industry and research capacities involving the outstanding innovation potential of SMEs. Listen2Future will create tangible results to be exploited in a new generation of products and in a first-of-the-kind solutions on their way towards commercialization.

1.4.2 Listen2Future vision and structure

The vision of Listen2Future is to address the emerging needs of Society 5.0 in Health & Wellbeing and in Digital Industry & Energy. Through appropriate involvement of each group within the different planned actions, the consortium will bring the smallest micro-electro-mechanical sensors into high volume production at globally competitive costs and make them available for a wide range of applications for industry and medicine.

Listen2Future has defined 9 work packages (WP). All the working areas will involve the different project partners and take into account the specific social, cultural, economic and political contexts.

Table 1: Work Packages

WP	Title
1	**Use case and building block definition, requirements and alignment** Leader: SINTEF, Norway
2	**Towards more performant acoustic MEMS transducers for emerging applications** Leader: SAL, Austria
3	**Next generation Electronics for the intelligent Acoustic Signal & Data Processing Chain** Leader: IFAT, Austria
4	**Assembly and Packaging** Leader: HSG, Germany
5	**Algorithms & Embedded Software** Leader: BUT, Czech Republic
6	**Demonstration in emerging applications** Leader: CSIC, Spain
7	**Dissemination, Communication, Exploitation** Leader: UGR, Spain
8	**Project management** Leader: IFAT, Austria
9	**Ethics requirements** Leader: IFAT, Austria

Listen2Future will focus on the next generation of piezoelectric acoustic transducers technology particularly addressing 3 major objectives along and across the entire vertical value chain of transducers systems. These objectives focus on research and innovation in the fields of transducer (including materials, equipment, and device concepts), packaging, signal processing hardware (ASICs) and software and algorithm and as listed below:

Table 2: Listen2Future Objectives

Objective	Title
1	Create a new generation of MEMS transducer with increased performance for acoustic applications. Generate a strong IP portfolio to foster European leadership and excellence in international competition.
2	Provide dedicated hardware accelerators/processors and AI powered algorithms for real-time, integrated signal processing. Enable best-in-class, intelligent and low-power acoustic systems.
3	Demonstrate of innovation potential, usability, and versatility of the new acoustic system solutions in existing and emerging applications in Health & Wellbeing and Digital Industry & Energy key applications areas.

This plan has been developed by WP7 lead by the UGR – Spain (herein after referred as the project communication team).

2 About this strategy

2.1 Key adopted concepts

Key adopted concepts concerning communication and dissemination, based on European Commission's documents, are presented in this section.

2.1.1 Communication

"Communication is to inform and reach out to society"
Alexandra Ruete
Communication Officer, DG Research & Innovation
European Commission

Science communication focuses on the wider audience including non-scientific. As Alexandra Ruete says: "Communicating to society is a matter of giving back in some way a return for its taxes that also finance the European projects"[1].

Communication is about showing society how research and innovation is impacting their lives; is about knowing the audience and making it count; is about being visual, interactive and personal with any material generated; is about using infographics, videos and social media profiles; is about creating conversations and engaging the audience to ask questions about researchers jobs and results.

The communication activities of European projects go beyond dissemination: they do not involve project results only but also how the project addresses the societal challenges and the European added-value of the project (digital sovereignty). As already mentioned, communication activities target a much wider audience than dissemination ones, including the media and the general public. It is important to use a less technical language so that a non-specialist audience can easily understand the goals and means of the project.

For example, communication activities include: visual identity (logo, graphic charter, etc.), public website, leaflets and flyers, social media, videos, press releases, etc.

With the communication activities we call attention of multiple audiences about our research (in a way that they can be understood by non-specialists) and address the public policy perspective of EU research and innovation funding, by considering aspects such as[2]:

- Transnational cooperation in a European consortium (i.e. how working together has allowed to achieve more than otherwise possible)
- Scientific excellence

[1]https://www.youtube.com/watch?v=0JbLCd-7u7g&list=PLvpwIjZTs-Lhe0wu6uy8gr7JFfmv8EZuH&index=2
[2]https://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/communication_en.htm

- Contributing to competitiveness and to solving societal challenges (eg. impact on everyday lives, better use of results and spill-over to policy-makers, industry and the scientific community).

2.1.2 Dissemination

"The audience of the dissemination are those how might use the results"
Alexandra Ruete
Communication Officer, DG Research & Innovation
European Commission

Dissemination means sharing research results with potential users - peers in the research field, industry, other commercial players and policymakers. By sharing the research results with the rest of the scientific community, the project is contributing to the progress of science in general.[3]

Project outcomes may include concrete (tangible) results, knowledge, skills, and experience that both the project organizers and the participants have acquired (abstract results). Some examples are products, methods, experiences, best practices, recommendations or guidelines.

Main goals of dissemination are:

- To share information both on the project in general and on specific activities and products, highlighting their added value and innovativeness;
- To raise awareness of the importance of the project for the areas concerned;
- To strengthen and broaden the involvement and participation of target groups;
- To facilitate and strengthen the relationships between the project partners to achieve the expected results;
- To publicise the funding of the European Commission and its commitment to the development of territories and citizens;
- To influence decision-makers and facilitate their decisions by formulating recommendations;
- To raise the awareness of future funding authorities by ensuring the continuity and sustainability of the project.

[3]https://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/dissemination-of-results_en.htm

Table 3: Chart dissemination vs communication

COMMUNICATION	DISSEMINATION
Covers the **whole project** (including results)	Covers project **results only**
Starts at the **outset** of the project	Happens only once **results are available**
Multiple audiences Beyond the project's own community, including the media and general public. Multiplier effect.	**Specialist audiences** Groups that may use the results in their own work, including peer groups, industry, professional organisations, policymakers
Informing and **engaging with society**, to show how it can benefit from research	Enabling the **take-up** and **use** of **results**
Legal reference Grant Agreement Article **38.1**	*Legal reference* Grant Agreement Article **29**

Font: https://ec.europa.eu/research/participants/data/ref/h2020/other/grants_manual/amga/soc-med-guide_en.pdf

2.2 Listen2Future Work Package 7: Dissemination & Communication

Main objective of WP7 is to increase awareness for the impact of MEMS acoustic transducers in medical care, healthy aging, energy security and product quality, by promoting the gained knowledge and results, use and application among different target audiences.

This plan will be the main tool to guide the work developed by WP7 ensuring that all the implemented activities are part of a well-designed communication and dissemination strategy:

- Based on evidence
- Based on participation: shared and fed with inputs from partners and stakeholders
- With a clear vision
- With defined and SMART (Specific, Measurable, Appropriate, Realistic and Time Bound) objectives
- With clear priorities and adapted to the available resources
- With well planned activities to be implemented in coordination with other work packages
- With sustainable results even after the end of the project

2.3 Overarching goal of communication activities

With the statement below we intend to clarify what is important and illustrate what we want to happen in the future. It is important to differentiate vision from objectives. While objectives should be SMART (Specific, Measurable, Appropriate, Realistic and Time-Bound), the vision for communication represents the dream goal that anchors the strategy and guides its design and implementation process.

VISION

Europe leads the market for digital MEMS transducer technologies:

- "MEMS sensors" are brought into high volume production at globally competitive costs
- Patients are aware of benefits of new and smallest microphone and ultrasound sensors for examinations in medicine
- Citizens know the importance of research for the development of digital solutions that fulfilling needs in healthcare and industry

2.4 Strength, Challenges and Opportunities analysis

An analysis of strengths, challenges and opportunities within the current environment helps to structure the plan.

Table 4: Strength, Challenges and Opportunities analysis

SCO	Title
Strengths	What are your communication plan's strengths? What gives you an advantage over other programs? What do you do best? What communication and institutional resources do you have? • One of the first European public-private alliance in the field • European countries working together and joining forces • 27 expert partners in the field • Many tangible results expected to be disseminated
Challenges	In what areas (geographical, approaches, reach) do you see challenges? • Limited budget and human resources • Need to select and prioritize communication objectives and activities • Large number of different cultures and languages in Europe need to be aligned in one communication strategy • Translation and adaptation of the materials to the national contexts need high quality partners support

Opportunities	What opportunities (other related communication programs, popular media venues) are available for you? What opportunities could you take advantage of? What external elements could help you to reach your vision? • Make use of Society 5.0 discussion because they affect everyone. We have partners in 7 European countries that can give us support disseminating the activities nationwide.

2.5 Target audiences

Table 5: Potential audience segmentation

	Demographic Characteristic (Age, gender, education)	Geographic Characteristic (Region, urban or rural)	Socio-Cultural Characteristic (Language, culture, religion, place in society, ethnicity)	Behavioural Characteristics (Behaviours that affect or impact the challenge)	Psychographic Characteristics (Personality, values, attitudes, interests, lifestyle)	Ideational Characteristics*
General Public	All gender, all ages, all education	-European people from urban areas from 7 countries -Working in urban and rural areas -Easy access to public education -Easy access to information	-7 National languages -Different cultures -Low/Middle/High social and economic status	-Lack of awareness about how MEMS ultrasonic transducers work -Lack of information about the applications and benefits of MEMS -Lack of knowledge about alternative treatments to health issues or security problems -Other important issues in their life (employment, mortgage, etc.)	-Committed to tackle their own problems -All personalities -Mixed lifestyles	-Willing to learn about MEMS ultrasonic transducers through the news, audiovisual projects, Social Media channels, etc. -Share the knowledge with family and friends (spread the word)

	Demographic Characteristic (Age, gender, education)	Geographic Characteristic (Region, urban or rural)	Socio-Cultural Characteristic (Language, culture, religion, place in society, ethnicity)	Behavioural Characteristics (Behaviours that affect or impact the challenge)	Psychographic Characteristics (Personality, values, attitudes, interests, lifestyle)	Ideational Characteristics*
Healthcare Industry	-From 30 to 65 years old -University education -All gender	-European people from urban areas from 7 countries -Working in urban	-7 National languages -Different cultures -Middle/High social and economic status	- Economic benefits linked to expensive treatments and medicines -Lack of awareness of the importance and the benefits of MEMS ultrasonic transducers in health and well being	-Committed to benefit industry interests -All personalities -Mixed lifestyles	-Willing to invest in research & innovation related to MEMS -Willing to participate in Listen2Future events -Staying up-to-date in latest news and discoveries
Healthcare Organizations	-From 22 to 65 years old -University education -All gender	-European people from urban and rural areas from 7 countries -Working in urban areas	-7 National languages -Different cultures -Middle/high social and economic status	-Not aware of the importance and the benefits of MEMS ultrasonic transducers in health and well being -Lack of awareness about the new	-Responsible and committed to health care	-Motivated to learn about benefits of MEMS ultrasonic transducers in health and well being -Willing to collaborate with Listen2Future to investigate about

	Demographic Characteristic (Age, gender, education)	Geographic Characteristic (Region, urban or rural)	Socio-Cultural Characteristic (Language, culture, religion, place in society, ethnicity)	Behavioural Characteristics (Behaviours that affect or impact the challenge)	Psychographic Characteristics (Personality, values, attitudes, interests, lifestyle)	Ideational Characteristics*
				generation of MEMS ultrasonic transducers -Challenges to collaborate with external institutions/companies		MEMS and prove new technologies -Willing to assists to Listen2Future events -Willing to share new knowledge inside healthcare settings -Willing to teach professionals and patients about MEMS benefits -Staying up-to-date in latest news and discoveries
Journalists	-From 20 to 65 years old -University education -All gender	-European people from urban areas from 7 countries -Working in urban areas	-7 National languages -Different cultures -Middle social and economic status	-Most of them are not specialized in science and tech communication	-Committed to inform and disseminate truthful information -All personalities	-Willing to publish relevant information about MEMS applications (interviews, reports, audiovisuals, etc.)

	Demographic Characteristic (Age, gender, education)	Geographic Characteristic (Region, urban or rural)	Socio-Cultural Characteristic (Language, culture, religion, place in society, ethnicity)	Behavioural Characteristics (Behaviours that affect or impact the challenge)	Psychographic Characteristics (Personality, values, attitudes, interests, lifestyle)	Ideational Characteristics*
				-Agenda full of hot topics -Lack of time to invest in deep reports or interviews related to MEMS ultrasonic transducers -Influenced by political and economic decision	-Mixed lifestyles	
Listen2Future Partners	- From 27 to 60 years old -University education (different specialties) -All gender	-European people from urban areas from 7 countries -Working in urban areas	-7 National languages -English as common language -Different cultures - Middle/High social and economic status	-Lack of time to dedicate to public communication and outreach -Lack of time to assist to all congresses and meetings related to MEMS (dissemination)	-Committed to develop a new generation of MEMS -All personalities -Mixed lifestyles	- Recognize the importance of communication, outreach and dissemination -Willing to support the project communication team -Participate in dissemination and

	Demographic Characteristic (Age, gender, education)	Geographic Characteristic (Region, urban or rural)	Socio-Cultural Characteristic (Language, culture, religion, place in society, ethnicity)	Behavioural Characteristics (Behaviours that affect or impact the challenge)	Psychographic Characteristics (Personality, values, attitudes, interests, lifestyle)	Ideational Characteristics*
				-With heavy workloads and not dedicated full time to Listen2Future project		public communication events -Proactive in communication and dissemination matters -Always use the brand image as an umbrella for all actions made on behalf of the Listen2Future project.
Patients and families	All gender, all ages, all education	-European people from urban and rural areas from 7 countries -Easy access to public health -Easy access to public education	-7 National languages -Different cultures -Different places in society	-Lack of awareness about the benefits of MEMS ultrasonic transducers -Lack of awareness about MEMS -Lack of awareness about how MEMS work	-All personalities -Mixed lifestyles -All attitudes and interests	-Eager to learn and prove new applications about MEMS ultrasonic transducers -Willing to implement the knowledge acquired -Share the information

	Demographic Characteristic (Age, gender, education)	Geographic Characteristic (Region, urban or rural)	Socio-Cultural Characteristic (Language, culture, religion, place in society, ethnicity)	Behavioural Characteristics (Behaviours that affect or impact the challenge)	Psychographic Characteristics (Personality, values, attitudes, interests, lifestyle)	Ideational Characteristics*
		-Easy access to news				-Meet the doctor's prescription -Ask to the doctor why antibiotics are prescribed -Don't ask for antibiotics without a prescription
Policy Makers	-From 30 to 65 years old -University education -All gender	-European people from urban areas from 7 countries -Working in urban areas (mostly)	-7 national languages -Different cultures -High social and economic status	-Lack of information about MEMS ultrasonic sensors -Agenda full of hot topics -Lack of economic resources to invest in research & innovation -Surrounded by people with little	-Committed to lead countries at all levels (local, regional, national) -Have the power and are the decision makers -Self-confident - High standing lifestyle	-To include R&I in their agenda -Willing to listen to the benefits of investing in R&I from experts - To invest in research and innovation related to MEMS projects

	Demographic Characteristic (Age, gender, education)	Geographic Characteristic (Region, urban or rural)	Socio-Cultural Characteristic (Language, culture, religion, place in society, ethnicity)	Behavioural Characteristics (Behaviours that affect or impact the challenge)	Psychographic Characteristics (Personality, values, attitudes, interests, lifestyle)	Ideational Characteristics*
				understand about MEMS -Lack of interest in science		
Scientific Community	-From 25 to 65 years old -University education -All gender	-European people from urban and rural areas from 7 countries -Working in urban areas	-7 National languages -Different cultures -Middle/high social and economic status	-Lack of resources to investigate MEMS ultrasonic transducers	-Responsible and committed to health care -All personalities -Mixed lifestyles	-Motivated to investigate about MEMS ultrasonic transducers -Willing to collaborate with Listen2Future partners -Willing to share new knowledge inside scientific community -Willing to collaborate with health care organizations

	Demographic Characteristic (Age, gender, education)	Geographic Characteristic (Region, urban or rural)	Socio-Cultural Characteristic (Language, culture, religion, place in society, ethnicity)	Behavioural Characteristics (Behaviours that affect or impact the challenge)	Psychographic Characteristics (Personality, values, attitudes, interests, lifestyle)	Ideational Characteristics*
Sensor Industry	-From 22 to 65 years old -University education -All gender	-European people from urban and rural areas from 7 countries -Working in urban areas	-7 National languages -Different cultures -Middle/high social and economic status	-Lack of awareness about the new generation of MEMS ultrasonic transducers -Challenges to collaborate with external institutions/companies	-Committed to benefit industry interests -All personalities -Mixed lifestyles	-Motivated to implement new generations of MEMS ultrasonic transducers in their products -Willing to collaborate with Listen2Future to investigate about MEMS and prove new technologies -Willing to assists to Listen2Future events
Students	- From 18 to 30 years old -University education - All gender	-European people from 7 countries -Living in urban areas	- 7 national languages - Different cultures - Middle social and economic status	-Still deciding about post graduate programs -Lack of awareness about how MEMS ultrasonic transducers work	-Committed to become a remarkable professional -Willing to be part of a great team -All personalities	-Willing to dedicate time to investigate about MEMS -Motivated to

	Demographic Characteristic (Age, gender, education)	Geographic Characteristic (Region, urban or rural)	Socio-Cultural Characteristic (Language, culture, religion, place in society, ethnicity)	Behavioural Characteristics (Behaviours that affect or impact the challenge)	Psychographic Characteristics (Personality, values, attitudes, interests, lifestyle)	Ideational Characteristics*
				-Lack of information about the applications and benefits of MEMS -Lack of knowledge about alternative treatments to health issues or security problems	-Mixed lifestyles	

*(May include knowledge, beliefs, attitudes, perceived risk, self-efficacy, social support and influence, environmental supports and constraints, emotions, norms, perceived risk, self-image)

2.6 Communication objectives

2.6.1 About SMART objectives

To keep our efforts focused and on track, this strategy identifies SMART communication objectives linked to indicators in order to track progress and demonstrate impact. SMART objectives are:

Specific: Does the objective say who or what is the focus of the effort? Does it cover only one challenge?

Our communication objectives will clearly define what we aim to achieve through our communication efforts. We will identify specific target audiences, such as policymakers, researchers, and industry professionals, and determine the key messages we want to convey to each group. In section "2.5 Target audiences", an in-depth analysis of our potential audiences is provided. Only by knowing the people we are targeting, we can connect with their needs and make them interested in the solutions that Listen2Future can offer them.

Measurable: Can your objective be measured in some way? Does the objective include a verifiable amount or proportion of change expected?

We will establish clear metrics to assess the effectiveness of our communication activities. This may include tracking website traffic, social media engagement, media coverage, event attendance, or survey responses. In section "2.8 Evaluation indicators", KPIs for measuring the communication and dissemination activities are provided.

Appropriate: Is the objective sensitive to audience needs and preferences? Is the objective sensitive to societal norms and expectations?

Our communication efforts will be tailored to the preferences and needs of our target audiences. We will conduct audience research to understand their communication preferences, such as preferred channels (e.g., newsletters, social media, conferences), content formats (e.g., articles, videos, infographics), and language preferences. By adapting our messaging and delivery methods to suit each audience segment, we can effectively engage and resonate with them. In section "2.7 Strategic approaches descriptions", a relation of channels and formats are provided. They have been decided after studying our audiences.

Realistic: Can you realistically achieve the objective with the time and resources available? Is the degree of expected change reasonable given these conditions?

Our communication objectives will be grounded in reality and achievable within the project's timeframe and available resources. We will set goals that are ambitious yet feasible, considering factors such as budget, team capacity, and external constraints. By setting realistic targets, we can maintain motivation and ensure that our communication efforts align with the project's overall objectives. Section "2.4 Strength, Challenges and Opportunities analysis" presents the picture of the current environment and helps to structure the plan realistically.

Time-bound: Does the objective state the time period for achieving change?

We will set clear timelines and deadlines for our communication objectives. This includes establishing milestones for specific activities, such as launching a project website, publishing regular updates, organizing events, or submitting articles to relevant publications. By defining time-bound objectives, we can stay on track, monitor progress, and ensure that our communication activities align with project milestones and deliverables. In "Table 8 - Dissemination & Communication timeline", activities are presented in a realistic time frame.

2.6.2 The ‘Glocal’ approach

This strategy is based on a ‘glocal’ approach, which means presenting global knowledge within a local context. The term ‘glocal’ is a combination of the words global and local, and it encapsulates the concept ‘Think globally, act locally’. The main objective is to take a global issue, make it meaningful to society at a local level and adapt messages and strategies to local contexts and needs.

In the particular case of Listen2Future, the communication team will plan and design activities (each of them with specific communication objectives and targeted at different audiences), implement them at EU level in English and offer them to the different partners for local adaptation and implementation.

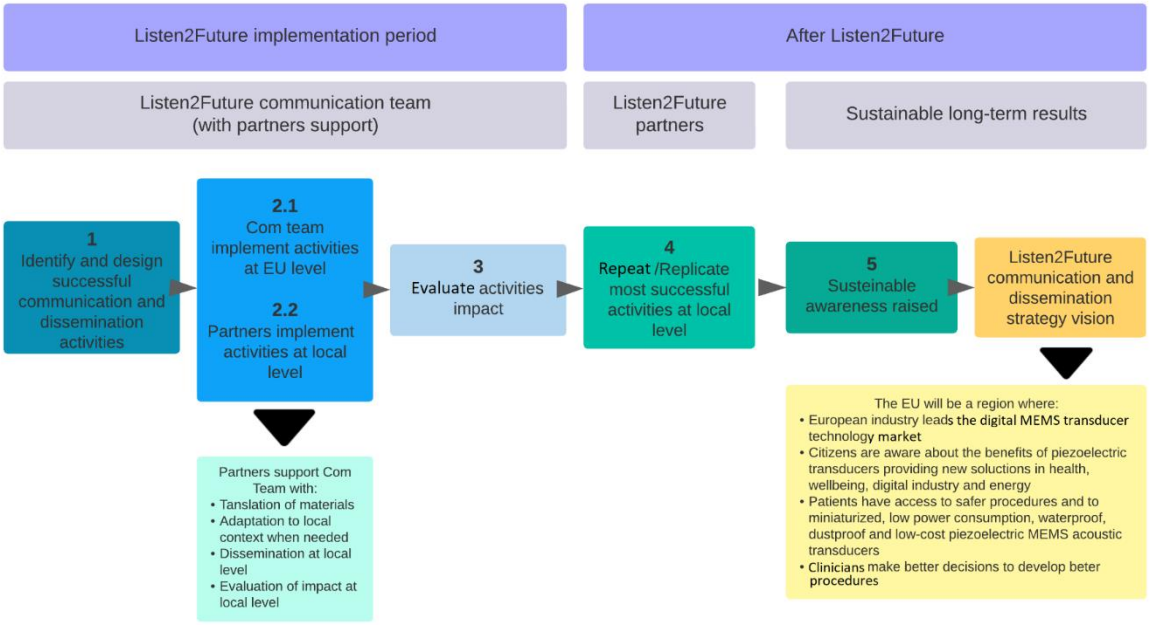


Figure 1: ‘Glocal’ approach and sustainability of this strategy after the project

2.7 Strategic approaches descriptions

The strategic approaches describe how the objectives will be achieved. They guide the development and implementation of activities and determine the vehicles, tools and media mix that will be used.

Congresses, events and workshops

Main achievements of Listen2Future that will be defined as “public” will be presented at selected international conferences on both semiconductor (sensor and sensor systems) related events as well as on health, wellbeing and patient (care for patient needs) related events.

The most important conferences and workshops will be MICCAI, EuroEcho, American Society of Echocardiography Annual meeting, MedTech Summit, MedTech Strategist Innovation Summit, LSI Emerging Medtech summit, Tech Tour Health, LSX World Congress, EIT Health Summit, The Medtech forum, Knowledge for Growth, Semicon Europe for the sensor and semiconductor target groups.

For the presentation of the prototype devices, we will additionally choose semiconductor and electronic fairs and conferences like IEEE SENSORS and IEEE SENSORS Applications (SAS). All presentations/posters/videos will follow a common and easily recognisable “look” to increase Listen2Future’s visibility.

For training and outreach, some research institutions will provide seminars and tutorials at free online seminar series, which are all followed by a large community of students around the world. Public results can be l be made available as training material. The partners will train PhD and MS students, and twice as many students will be involved in key experiments where they gain relevant exposure to the topics of Listen2Future. Moreover, young researchers will be reached through online presentations, e-activities and tutorials.

Finally, the partners are actively involved in the organisations to effectively reach out to policy makers and will provide streamlined information for the IEEE Sensors Council as well as the Working Group on e-Cardiology of The European Society of Cardiology; Association of Cardiovascular Nursing and Allied Professionals (ACNAP); European Heart Network (EHN), in particular the EHN Patient Working Group; Heart Failure Policy Network for healthcare and wellbeing.

Publications

Listen2Future will target publications in journals related to sensors, material science, health and wellbeing, industrial digitalization and semiconductor solutions for production processes, sensor development, sensor systems.

Targeted journals are: Nature Nanotechnology, Nature Electronics, Nature Materials, Nano Letters, Advanced Materials Nature Communications, Physical Review B, Applied Physics Letters, and Journal of Applied Physics when addressing the scientific community, and IEEE Transactions on Magnetics, the IEEE Sensors Council journals (like Sensors Journal, Sensors Letters), IEEE Internet of Things, IEEE Transactions on Big Data, and the IEEE Journal of Electromagnetics, IEEE Transactions on Medical Imaging; Journal of the American College of Cardiology – Cardiovascular Imaging; European Heart Journal – Cardiovascular Imaging; Journal of the American Society of Echocardiography to address our applied audience.

The list of most effective journals for dissemination will be re-evaluated on a regular basis. Amongst these tools also dissemination services of the European Union like the Open Research Europe platform for publishing and sharing will be used.

The planned publications were defined in the proposal phase. The following table shows the intended publications by partner.

Table 6: First set of planned publications

Name of activity Publications	**Number planned and in which month (of 36)**	**Target group**	**KPIs (people reached)**
IFAT	3 (12, 24, 36)	Scientific community	500+
SAL	3 (12, 20, 30)	Scientific community	100+
PULS	3	Scientific & professional community	500+
IMEC	2 (12, 20)	Scientific community	500+
BUT	2 (28, 36)	Scientific community	500+
IFAG	2 (24, 32)	Scientific community	500+
TUM	4 (24,32)	Scientific community	500+
HSG	2 (24, 36)	MEMS community	500+
IFD	3	Scientific & professional community Scientists & Professionals	500+
TUDA	4 (18, 24, 30, 36)	Scientific community	3000
INOSON	2 (24, 36)	Technical newspapers	20,000+
SINTEF	2 (30)	Scientific community	500+
ELLIPTIC	1	Decision Makers in Companies	1000+
SONITOR	2	Science and Engineering community, technology marketing partners, service providers	>10.000
CSIC	2 (< month 12, 24)	Scientific community	500+
DASEL	1 (30)	Industry	8000
NBS	1 (36)	Industry and research institutions	1000+
UGR	1 (24)	Scientific community	500+

SMD	1 (24)	Hair implant clinics	500+

Media Relations and Press Releases

Mass media can reach large audiences cost-effectively through the formats of radio, television and newspapers. Once we had developed Listen2Future's unique selling proposition (or USP), media exposure can be a powerful way of reinforcing the messages, our values, and our accomplishments.

The communication team will follow the activities of project partners with the purpose of elaborating press releases with general interest that could be distributed in different countries. An average of at least three press releases per year will be made in order to be translated and distributed in the countries of the project partners. In addition, partners are able to elaborate press releases in relation to their own activities in the project.

Podcast

Podcasting reached 424.2 million listeners worldwide in 2022 and it is predicted that there will be around 504.9 million podcast listeners worldwide by the end of 2024[4]. With regard to Europe, according to a report by Reuters Institute for the Study of Journalism in 2021, podcast listening has been growing rapidly across the continent, estimating that there are tens of millions of regular podcast listeners. The report states that in some countries, such as Sweden and Spain, more than 40% of the population listens to podcasts regularly, while in the UK and Germany, the figure is around 18-20%.

Listen2Future will produce its own podcast through the RadioLab UGR. The episodes will be available on Listen2Future website.

RadioLab UGR, by July 2023, has produced 43 different programs, they have 62153 reproductions and it is listened in 24 countries.

Social Media

The Listen2Future presence in online social networks is currently happening in Twitter, Facebook and LinkedIn. These active profiles are updated regularly through new content, images, animations, information, etc., contributing to generate interest and enhance support from the community at large. Some fundamental guidelines when using social media channels that can be summarized in:

1. Requiring truthfulness in social media outreach.

2. Monitoring the conversation and correct misstatements.

3. Establishing social media policies to be followed by the project members, collaborators and advocates.

A particular effort needs to be made on the online outreach in terms of production, content and update. The most of this effort will be done by the Listen2Future communication team, but help from all the participants will be required.

Website

Online outreach is a natural channel to reach thousands of people around the world. An official website in English has been developed (https://www.listen2future.eu/). The content of the website is divided in menus dedicated to general information about the project; each work

[4] https://www.demandsage.com/podcast-statistics/

package objectives; news and events; audio-visual materials and contact. It is a lively site constantly updated. It will also be used to inform the stakeholders about the Listen2Future initiative, activities (seminars, labs, webinar, workshops), and encourage their participation.

The digital strategy is focused on the Website as the project's genuine space where all dissemination and communication activities are concentrated, particularly with regard to the creation of its own content. This content is then disseminated through the different networks of the project according to the style and audience of each of them. On the website, the podcasts, the messages that will go to the networks and the newsletter itself are reviewed.

Newsletter

In order to disseminate the most relevant information that emerges from the project, a newsletter will be produced every 3 months and will be disseminated among the project´s contact list. Special e-issues will also be distributed when necessary (for example, to announce a special project event, a result, etc.)

2.8 Evaluation indicators

The following table shows an overview of the indicators that will be taken into account to evaluate the L2F communication and dissemination actions throughout the entire project. A more detailed explanation of the measurement of each activity is shown in tables 8 “Dissemination & Communication timeline”, 9 “Dissemination actions planned” and 10 “Communication action planned” within the section 3 “Dissemination & Communication impact”.

Table 7: Evaluation indicators

ACTIVITIES	INDICATORS
NETWORKS	Number of contacts: visitors, event participants, calls, emails, etc. (counting) Target KPI: 40 participations in conferences
EVENTS	Number of attendees: physical and online (counting) Target KPI: 30 internal events/1600 attendees
PUBLICATIONS	Number of readers of the publication (web analytics/media analytics) Target KPI: 35 scientific publications/50.000 readers
MEDIA RELATIONS	Number of online views of media releases (web analytics) Target KPI: 300 readers
PODCAST	Number of views/reproductions, embeds and downloads (web analytics, social media metrics, global counting) Target KPI: 300 reproductions

SOCIAL MEDIA	• Number of impressions (social media metrics) • Number of followers/fans/subscribers (social media metrics) • Number of posts (social media metrics) Target KPI: 500 followers
WEBSITE	Number of visits (web analytics) Target KPI: 3000 visits

2.9 Slogan/Claim

Aiming at developing a memorable identity, the positioning statement/slogan below guides the development of key messages and ensures that they all have a consistent voice and that all planned activities reinforce each other for a cumulative effect.

Building the digital ear of the future

2.9.1 Visibility key messages for external communication

When working on a project with partners from different countries and realities, having common messages for external communication is vital for maintaining consistency, clarity, and professionalism. It ensures effective communication with external stakeholders, mitigates cultural and language barriers, and enhances the project's overall reputation and impact on a global scale:

1. Consistency in Branding and Image: Common messages ensure that the project's branding, vision, and mission are consistently conveyed to external stakeholders, regardless of the partner communicating with them. A unified message reinforces the project's identity and reputation globally.

2. Clarity and Understanding: External stakeholders, such as customers, investors, or the public, need to understand the project's objectives, benefits, and impact. Common messages eliminate confusion and misinterpretations, enabling clear and straightforward communication.

3. Professionalism and Credibility: A consistent and well-crafted message demonstrates professionalism and credibility. It shows that the project is well-organized, coordinated, and serious about its goals, which can build trust and confidence among external audiences.

4. Cultural Sensitivity: Different countries have unique cultural norms and communication preferences. Common messages can be tailored to be culturally sensitive, avoiding any unintended offense or misunderstanding while resonating with diverse audiences.

5. Coordinated Messaging: Common messages help partners speak with one voice, presenting a unified front and reducing the risk of mixed signals.

The proposed messages that will form the basis of all project communication are as follows:

- **Together we are stronger**. Listen2Future brings together 27 partners from 7 countries to boost industrial competitiveness through interdisciplinary technology innovations in the value chain of acoustic sensors and to support the development of the home as the central location of the patient, building a more integrated care delivery system.

- **Listen2Future is intersectoral**. It is a coordinated action of institutions representing the public service and the private sector; this linkage is carried out to address the emerging needs of Society 5.0 in health & wellbeing and in digital industry & energy.

- **Society 5.0 needs a cross-sectoral response.** Involving all key actors is essential for facing society challenges such as environmental issues, aging population, increased need for energy and food, severe international competition, growing wealth, and regional inequality, among others.

- **Keeping Europe at the forefront of technology development.** The Public-Private partnership for research, development and innovation is essential for Europe's competitive leadership in the era of the digital economy.

3 Dissemination and Communication Impact

The main goal of all dissemination and communication actions is to maximise the impact of project. With an effective communication of our research activities, it is possible to translate them to innovations and create impact for the European industry. On a longer term, for the whole society, we are addressing the general public audience, either directly through high-quality and appealing products or through their impact in view of fulfilling needs in healthcare and industry. This is not only to communicate what we do, but also to revitalize an interest in science and technology, the ultimate enabler for a successful uptake of digital solutions in a sensitive field like “your own health”.

For our communication to a wider audience, we are going to participate in public events such as Pint of Science, Science week festival or the European Researchers’ Night, in addition to the project website and regular press-releases. Further, to address the technology-affine part of the society, we will write more than 3 articles in open science journals and organize "Hack the microphone" - Hackathon/webinar series - provide publishable technical findings for experiments that use our results for even more “out of the box” demonstrations available for interested individuals and groups.

Apart from these unique measures, we have created a project identity to make the project easy to be recognized. All outgoing activities as well as all internal documents will be done according to templates (see chapter 4 Brand Identity), using the correct disclaimers and formatting. Logo and website will be the foundation of this approach. Images, data, videos, and dissemination material as well as social media accounts (LinkedIn, Twitter, Facebook) have been branded to reach a larger public using the common Listen2Future identity. Among these are conference presentations, but also summer/winter schools to educate students in specific research topics who will then serve as amplifiers for our communication strategy by their naturally-existing relations with other younger persons. Table 8 shows the dissemination and communication timeline, Table 9 gives an overview of the dissemination planned activities and Table 10 shows an overview of the communication planned activities.

Table 8: Dissemination & Communication timeline

Strategy	Target audience	Description
Making the topic known (M01-M12)	Raising awareness, creating interested public, reaching out with the project ideas to the standard communities and beyond.	• Create a common look (identity) • Website, logo, leaflet (general project information, links to partners, presentation of targets, events and first presentation of leaflet, press release) • Set-up social media strategy • Define dissemination and exploitation strategy • Identify dissemination possibilities on national levels • Identify stakeholders, communities, interested users, key researcher groups outside consortium
Active Information (M12-M36)	Disseminate (Communicate) all scientific and technological progress (first outcomes and results). Engage stakeholders - spread the news of Listen2Future	• Publications in scientific open access journals > 40 • Actively participate (presentations) in conferences, at universities and arrange workshops • Be present in print and online media • Intensify social media presence (update, evaluate, improve) • Address national (partner countries), EU level and international dissemination channels
Intensified Information (M18-M36)	Presenting first results and prospective outcomes for possible exploitation	• Publish in journals and magazines on EU level on topics of physics, magnetics, spintronics and semiconductors • Update of dissemination strategy and social media presence – evaluate strategy, update, improve, if necessary, partner activities
Exploitation Actions (M28-M36)	Communication of exploitable results (if not IPR). Reaching out to communities in spintronics, magnetics/sensors. Informing possible customers (groups) on EU and international level	• Present results in > 5 international conferences/fairs (out of > 40 during the whole project duration) • Use industry channels to inform customers (IFAT internal process like “New Product Introduction”, Infineon Newsletter for Engineers, Market News) • Create final exploitation plan (confidential) • Make public presentations in EU conferences and related topics.

Table 9: Dissemination actions planned

Dissemination channels	Dissemination Focus	Target Stakeholders	Actions	Target KPI
Website and project logo	To inform the stakeholders about the Listen2Future initiative, activities (seminars, labs, webinar, workshops), and encourage their participation.	Public and private bodies: SMEs, Industries, Public Sector, Civil Associations, NGOs, Policy Makers	During the project execution: initial data entry by the Partners in the Web-form, previous search; regularly updated and international user collaboration. User access analysis (Google Analytics). Search Engine Optimization (SEO) implementation. After the Project: we will maintain the Web platform with the most relevant updates about future developments.	Website launch: as a main tool of the project, we expect an average of 1k annual visitors with peaks of increments matching with project activities.
Project Social Networks	To communicate and exchange activities (seminars, living labs, webinar, workshops) and project outputs	Public and private bodies: SMEs, Industries, Public Sector, Civil Associations, NGOs, Policy Makers	During the project execution: creation of a project profile on Twitter and Facebook (public page) linked to the project website. Configuration so that users can share data, comment, give ideas, etc. After the project execution: update of social networks publishing the most relevant updates about future developments.	In the1st year we expect around 200 followers on both Facebook, Twitter and LinkedIn. From the 2nd year on, we expect around 100 followers annually
Seminars and Webinars	To convey more detailed information about the consortium's activities and results	Academia: researchers, teachers, policy makers, SMEs, Industry.	During the project execution: seminars/webinar will be in the different languages of the consortium. After the project execution: the presentations of the seminars will be placed in Open Access. Once the seminar is done it will be available through the project website, academic repositories and in the European repository (Zenodo)	Webinars will be done mainly in English in order to have common actions for the whole consortium
Project Living Labs	User-centered, open-innovation testing activities.	Citizen, academia: researchers,	Only during the project execution: living labs will be used by some partners to test results and prototypes with end-users	A report with the main results from each living labs will be issued.

		teachers, policy makers, SMEs, Industry, Public Sector		
Focus group	Bring together specialists or publics to discuss about outcomes of the project.	Academia: researchers, teachers, policy makers, SMEs, Industry, Public Sector	Only during the project execution: specialists will be identified in the arguments discussed in order to invite them to participate in a group meeting lasting a couple of hours of approximately 8 or 10 attendees. The group should represent the plurality of actors of the interested parties	Realization of focus groups in some partners institutions.
Scientific Publications (articles, and e-books)	To share the project's findings and outputs	Researchers, scientist, academia	During the project execution: contact with high impact publishers to edit the results in Open access under the green access option, when possible. The publications will be carried out by the members of the consortium corresponding with their expertise	We expect to publish at least 35 publications (including scientific articles and industry reports), and around 40 conference participations (including proceedings in some of them).

Table 10: Communication actions planned - overview

Communication channels	Communication Focus	Public Target	Actions	Target KPI
Website Social Media Newsletter	Public engagement strategy	General public Students Scientific Community Local administration	• Website regular updates, SEO, project activities publication • Continuous update of the social networks of the project and link these networks with others, related themes, to spread the project information • Regular issues published on the project website-Blog, social networks and sent by email to registered users (mailing list)	Website: an average of 1k annual visitors with peaks of increments matching with project activities Social Media: in the1st year we expect around 200 followers on Facebook, Twitter and LinkedIn. From the 2nd year on, we expect around 100 followers annually Newsletter: Distribution list will start with the members of the project (114) and we estimate to reach 200 subscribers at the end of the project

Workshops in primary and high schools	Citizen awareness raising	Students	Conducting workshops in to raise awareness about the technologies in the project.	6 events during the project
EU researcher's night	Citizen awareness raising	General public Students	Participation of Listen2Future in the European Researcher's Night annually (September of each year). Only academic partners will participate.	At least, 1 academic partner per year will participate in the ERN
Podcasting	Citizen awareness raising	General public Scientific community Students Local administrations	Use of Radiolab UGR[5] to conduct interviews with specialists in citizen-driven innovation and promote the activities of Listen2Future	At least, 12 podcast during the project
Local press releases and press contacts	Citizen awareness raising	General public	Publication of articles in local press to inform about the Listen2Future project and the results ongoing	22 local press releases
Associated Partners communication channels (websites & social media)	Citizen awareness raising	General public Scientific community Policy makers Students Local administrations	Use of the internal communication channels of the Associated partners (mailing lists, newsletters, etc.) to publicize the initiative and encourage participation	40 web articles 40 social media publications

[5] https://medialab.ugr.es/radiolab/

4 Brand Identity

Having a cohesive and strategic visual identity help all targeted audiences to connect with and effectively promote all dissemination and communication materials and actions.

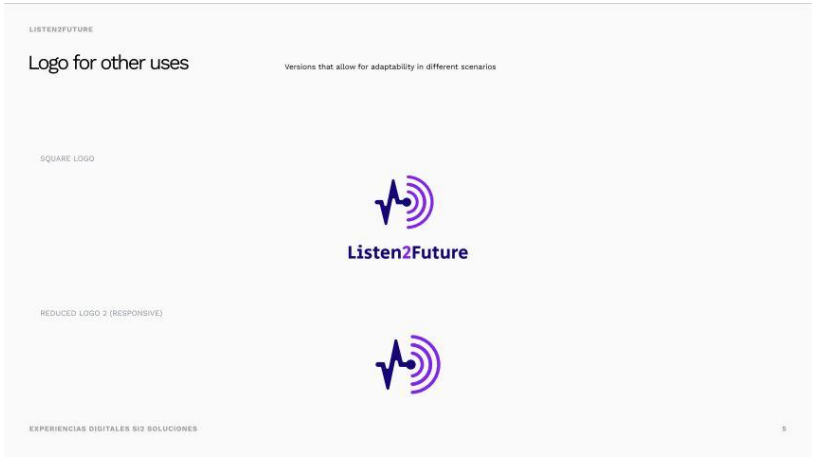
These are a few reasons why it is important to follow visual identity guidelines in EU projects:

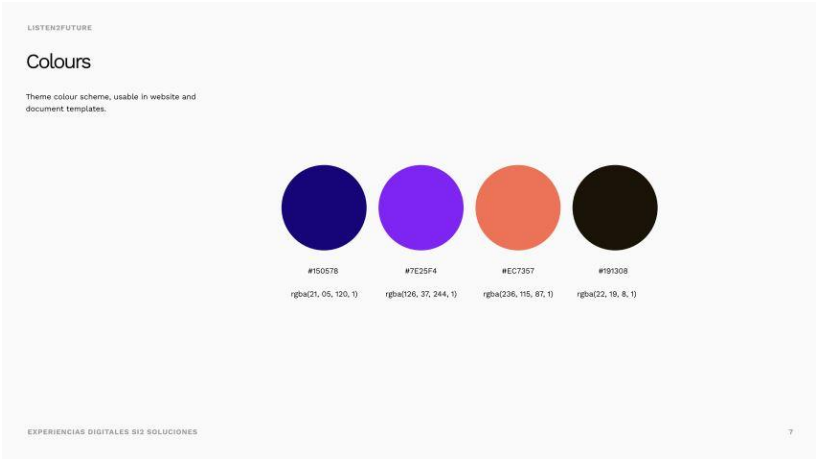
- To make a connection between the project's content and the communication materials.
- To help the audience resonate with the project's communication and dissemination actions.
- To easily identify the project when visiting fairs/events/conferences.
- To establish a connection between visual elements and the wording used to describe the project in different platforms (social media, web, print)

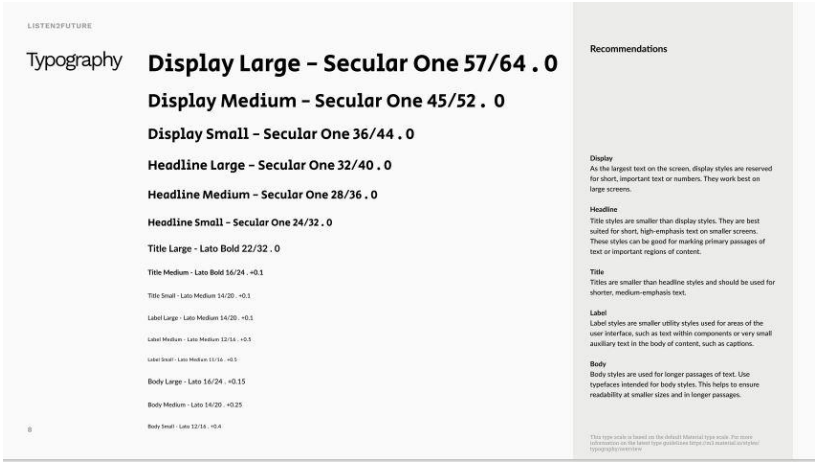
Listen2Future brand identity is showed in the next slides.


LISTEN2FUTURE
Identity elements
Logo
Colour palette
Typography
EXPERIENCIAS DIGITALES SI2 SOLUCIONES
3


LISTEN2FUTURE
Logo A
Versions that allow for adaptability in different scenarios
FULL LOGO
Listen2Future
REDUCED LOGO (RESPONSIVE)
EXPERIENCIAS DIGITALES SI2 SOLUCIONES
4


LISTEN2FUTURE
Logo for other uses
Versions that allow for adaptability in different scenarios
SQUARE LOGO
Listen2Future
REDUCED LOGO 2 (RESPONSIVE)
EXPERIENCIAS DIGITALES SI2 SOLUCIONES
5



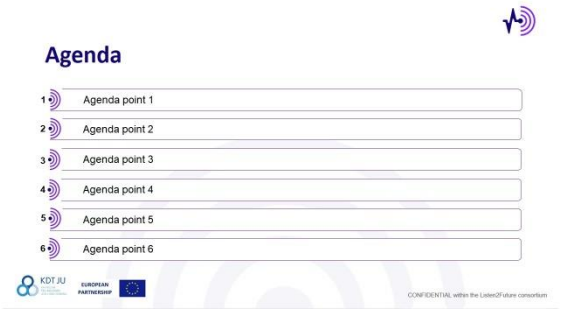


4.1 Templates

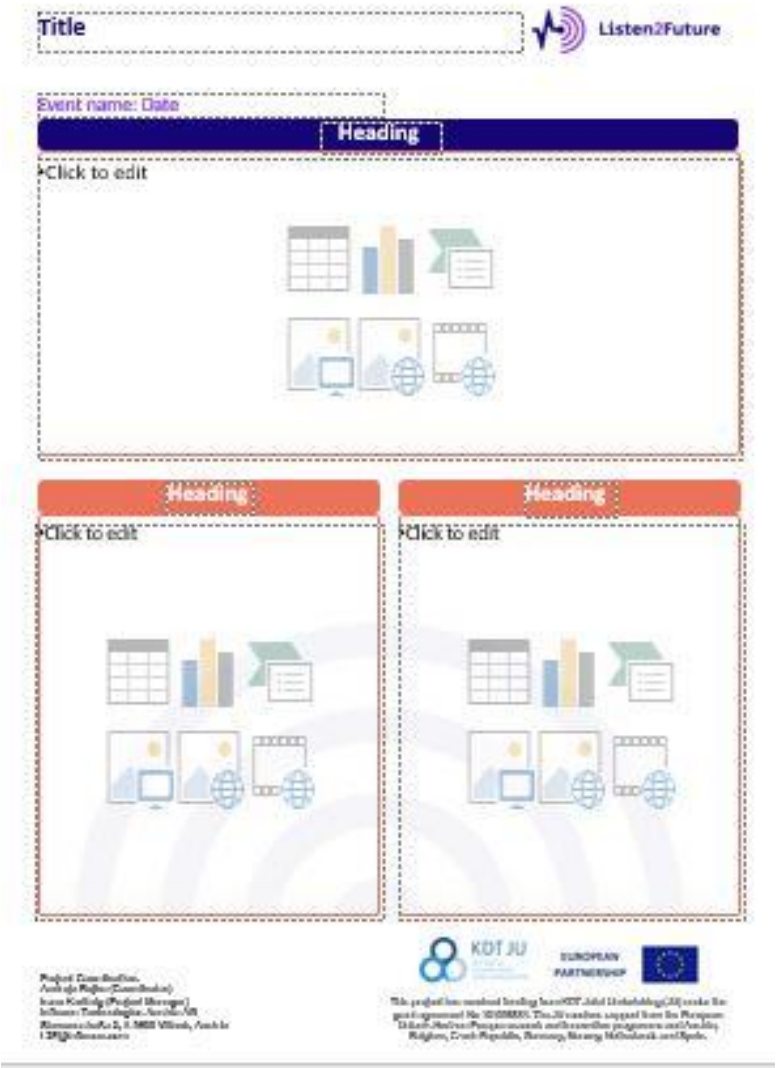
4.1.1 Power Point Presentations

The provided Power Point template must be used for all presentations related to Listen2Future project. Partners can feel free to duplicate slides, add their pictures and content but not alter

the design or layout. Templates are available in the Infineon iShare, the collaboration platform for the consortium.



4.1.2 Poster


Title
Listen2Future
Event name: Date
Heading
Click to edit
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KDT JU
EUROPEAN PARTNERSHIP

5 Internal Communication Strategy

5.1 General objective

It is very important for the project that all members are aligned in terms of the way and means in which Listen2Future information is communicated outward. Appropriate internal coordination with the communication area will be required. Our objective is to deliver an internal communications framework that provides clear, informative and engaging two-way communications, which will be planned and effectively linked with the key messages.

5.2 Specific objectives

- Simplify the structure of internal communications, channels and messages.
- Ensure that all the WPs inform and get informed about the events and activities developed during the project in advance.
- Promote two-way feedback with WP communication focal points and regularly respond to feedback received.
- Identify areas of success and areas in need of further attention.
- Establish an appropriate communication process in which the communication focal points of each WP receive the information and disseminate it through the WP participants.

5.3 Audience and process

The following mechanisms are orientated to the Communication Focal Points of each WP and the WP Leaders. They will be in charge of:

- Centralizing their WP information susceptible to be disseminated and transfer it to the WP leaders of communication.
- Disseminating the communication materials that WP7 will provide during the project:
    - Ensuring that the materials reach all the participants of their work package, and that the information flows in both directions.
    - Participating in the dissemination of communication materials and press releases through the members of their organization, their own social networks, web and their available channels, to help reach the target audiences.

5.4 Internal Communication tools/channels

5.4.1 Email

The communication team will contact the communication focal points when needed through email. Emails are one of the most common and versatile communication channels. However, the average number of emails received in a day is normally high, therefore WP7 will use the email correspondence only in the following cases:

- To inform about a new *communication materials/tools* that will be useful for every WP (templates, social media channel, website launch, etc.).

- To announce a publication submission. Accordingly to the Listen2Future Consortium Agreement, partners have 30 calendar days after receiving the notice to send any objection to the planned submission.
- To distribute the Listen2Future newsletter. Relevant news and events will be collected and send quarterly.
- To request information on the WP results, main events and activities in which the WP will participate/organize:
  - The main objective of this consultation will be to be informed about the main events or results of all the WPs in order to give support in the dissemination (uploading them in the website, spreading on social media, writing a press releases, etc.).
  - Information regarding events and activities should be shared at least 3 weeks before their execution.
  - This information will be requested monthly through two simple tables that WP7 will send to the communication focal points. Filling the excel will be mandatory for all WPs.

Dissemination activities				
Dissemination activity name	What? Type of dissemination activity	Who? Target audience Reached (several can be selected in different rows)	Why? Description of the objective(s) with reference to a specific project output (max 200 characters)	Status of the dissemination activity

Figure 2: Planned Activities table

Publications																		
Type of PID (repository)	PID of deposited publication	PID (Publisher version of record)	Type of publication	Link to publication	Title of the scientific publication	Authors	Title of the journal or equivalent	Journal number	ISSN or eISSN	Publisher	Month of publication	Year of publication	Was the publication available in open access through the repository at the time of publication	Peer-review	Was the publication available in open access?	Book title	Did you charge OA publishing fees to the project?	Type of publishing venue

Figure 3: Results & Publications table

The subject of the emails will include the following information to make them easily identifiable:

Listen2Future – WP7 - Topic

5.4.2 Meetings

Project Management Board meetings will be a good opportunity for both parts (communication team and other WP leaders) to discuss about the main subjects related to Listen2Future communication, for example:

- Summarize the latest most important activities related to communication, and the dissemination activities developed to support the visibility of the Work Packages.
- WP leaders could highlight the main challenge that may arise in the next months related to communication.

5.4.3 Intranet (iShare)

Listen2Future intranet (iShare) can be accessed through the Infineon website (https://www.infineon.com/) and clicking on “MyInfineon” section.

Permission to enter has to be requested from the coordination team.

The intranet will:

- Allow an efficient and effective up-to-date exchange of information.
- Function as project repository and central resource library organized according to the needs of the project.
- Be used as a shared workspace for the different project teams to inspire, and nurture collaboration, alignment, visibility, and engagement with one another.

When a WP leader or focal point have a specific publishable document finished, it should be informed to the communication team and it will be uploaded at the corresponding area in the website (and consider disseminating it through other ways).

5.4.4 The website

Newsletters and the news section of the website shall also play a role as internal communication tools.

Although targeted to external audiences, Listen2Future quarterly external newsletters will provide information that is directly relevant to the members of the consortium.

The messages to communicate and the information shall be centralized by WP7 as responsible for writing, compiling, editing, and disseminating the content in accordance to the purpose of the Newsletter.

The “News” and “Events” sections of the website, which shall target external communication, will serve also to keep partners informed of important milestones of the project, event announcements, and even to recognise partners’ contribution.

5.4.5 Communication flowchart

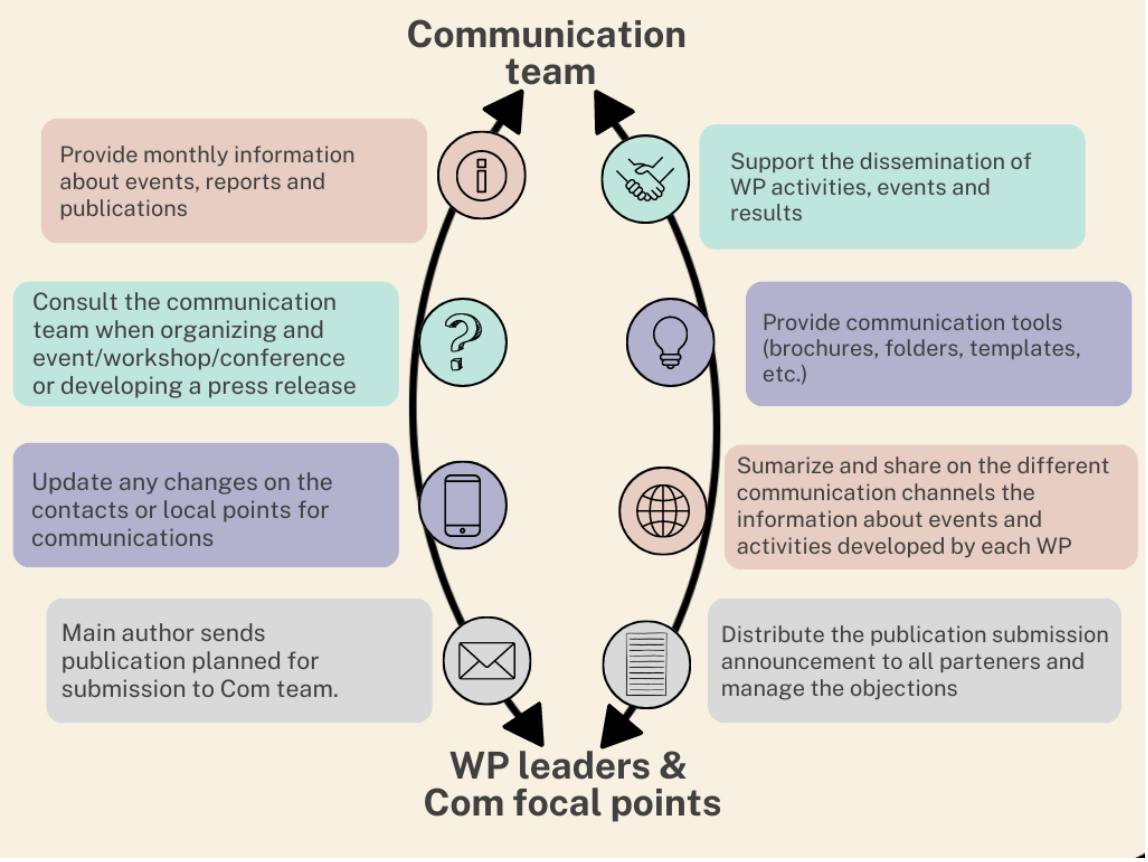

Figure 4: Communication flowchart

The organizational chart or communication flowchart is a valuable tool that promotes clarity, efficiency, and collaboration within Listen2Future project. It enhances communication practices, reduces misunderstandings, supports decision-making processes, and contributes to a positive and productive work environment.

Listen2Future flowchart gives to the partners the vision of the relation between then and the communication team. Communication pathways are presented for an efficient communication, reducing confusion in procedures. The chart also improve collaboration, as everyone knows who to approach for support.

5.4.6 Publication submission announcement

According to the chapter 8.4.1 of the Listen2Future Consortium Agreement:

During the Action and for a period of two (2) years after the end of the Action, the Dissemination of Results by one or several Parties including but not restricted to publications of whatever form (excluding patent applications(s) and other registrations of IPRs), shall be governed by the procedure of Article 17 with reference (17.4) to Annex 5 of the Grant Agreement subject to the following provisions:

Any publication planned by a Party shall be submitted through written notice to the other Parties at least forty-five (45) calendar days before the planned publication submission date. Any objection to the planned publication shall be made in writing to all Parties within thirty (30) calendar days after receipt of the written notice. If no objection is made within the time limit stated above, the publication is permitted.

Any objection to a planned publication by a Party is justified if any of the following applies:

a) the protection of the objecting Party's Results or Background is adversely affected;
b) the proposed publication includes Sensitive Information of the objecting Party;
c) the objecting Party's Legitimate Interests would be significantly harmed;

Any and all objection(s) shall include, to the extent possible, a precise request for necessary modifications.

Taking this into account, the process of publication of communication and dissemination materials will be as follows:

- The procedure will be led by our dissemination leader Ana Tamayo, University of Granada (anatamayo@ugr.es).
- Main author sends publication planned for submission to her and she will distribute the submission to all partners with a notice.
- If any objection will be made the procedure defined in Consortia Agreement will be followed.

5.4.7 Acknowledgment

Every publication has to include Listen2Future acknowledgment:

Under grant 101096884, Listen2Future is co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or Key Digital Technologies Joint Undertaking. Neither the European Union nor the granting authority can be held responsible for them. The project is supported by the Key Digital Technologies Joint Undertaking and its members (including top-up funding by Austria, Belgium, Czechia, Germany, Netherlands, Norway, and Spain).

Alternative acknowledgment text (shorter while abbreviations):

Under grant 101096884, Listen2Future is co-funded by the EU. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the EU or KDT JU. Neither the EU nor the granting authority can be held responsible for them. The project is supported by the KDT JU and its members (including top-up funding by Austria, Belgium, Czechia, Germany, Netherlands, Norway, and Spain).

5.4.8 KDT JU and EU emblem

All communication related to the project (including electronic communication, using social media, etc.) and all infrastructure, equipment or major results funded under the grant must display the EU Emblem and the KDT JU logo.

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5.4.9 Internal Communication Matrix

Table 11: Internal Communication Matrix

Internal Communication matrix					
Strategy	**Purpose**	**Intended results**	**Communication role**	**WP leader's role**	**Frecuency**
Email	Inform, engage	- Communication receives information to disseminate and feedback from the WPs. - WPs receive information and materials from communication & dissemination work package.	- Maintain all the WPs informed about new materials and news from WP7 - Give support on the dissemination of information to all the WPs.	- Maintain WP7 informed about any information/material developed by their WP susceptible to be disseminated. - Support WP7 on the dissemination of materials and campaigns among their networks.	WP7 will send a table to the Communication focal points that must be filled out monthly
Meetings	Inform, receive feedback	- A more interactive way to keep updated and give/receive feedback and contributions from other WPs.	- Update information about the last materials, campaigns, strategies developed.	-Update information of the developed and planned activities to other WPs.	When scheduled by coordination
Intranet (I-Share)	Exchange information	-Shared workspace for the different project teams to inspire, nurture collaboration, alignment, visibility, and engagement with one another.	- Make all communication materials available on the intranet.	- Make each work package materials available on the intranet.	When needed
Newsletter	Share Listen2Future information with internal and external audiences	- Keep all the target audiences informed and provide/update information that is directly	- Release quarterly newsletters.	- Maintain WP7 informed about the activities developed or to be developed susceptible to be published on the Newsletter.	Quarterly

		relevant to the members of the consortium.	- Improve the external database.		
Website	Inform	- The “News” and “Events” sections of the website will serve to keep partners informed of important milestones of the project, events and even to recognise partners’ contribution.	- Keep the website updated.	- Send WP7 any future event or activity, article, milestone, publication developed by their WP.	When needed

6 Social Media Strategy

A social media strategy will help us to map out a plan to build an audience of activated and informed followers and create an environment where it is possible to spread the word about research and innovation and inform and engage society about Listen2Future.

Social media profiles in Twitter, LinkedIn and Facebook have been created: @listen2future

The following slides show the Social Media Strategy for L2F project.

Context

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The audience

77% of households in the European Union use the Internet to search for information on technology

63% of Europeans use the Internet search for health information online

47% of households in the EU use the Internet to search for information on the environment, including energy-related topics

Fonts:
European Commission, 2018
Eurostat

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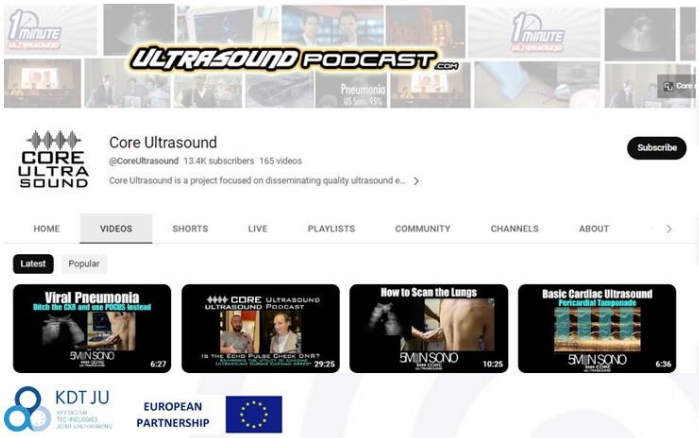
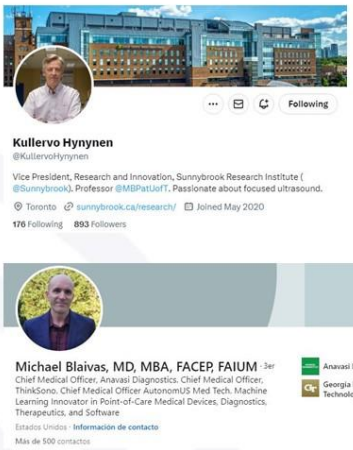
Who is talking about ultrasound

Independent Professionals





Who is talking about ultrasound

Professional groups

The keys

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Adding value by creating Content designed for the consumer

Social networks have become portals of useful content for the user

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Building our content from specialization will help us to segment and reach stakeholders

Pathologies, symptoms or treatments generate a lot of interest among social network users.

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Join efforts to reach qualified audiences through co-creation of content

27 institutions co-creating content can generate a very attractive feed

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Strategic proposal

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Preliminary analysis

CHANNEL ECOSYSTEM:

roles and goals

Our strategy focuses on generating valuable content of value by taking advantage of the characteristics of each channel of our ecosystem

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Content strategy

Our communication will be developed around five content pillars:

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Content strategy

Our communication will be developed around five content pillars:

Partners

- Positioning, identity, values: *Building the digital ear of the future*
- Excelence of the partners: *Together we are stronger*
- People, facilities, acreditations, research, innovation, scientific achievements, etc.

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Content strategy

Our communication will be developed around five content pillars:

Health& Wellbeing

- Medical advices
- Specific content
- World days

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Content strategy

Our communication will be developed around five content pillars:

Digital Industry & Energy

- Technological tips
- Energy saving
- Specific content
- World days

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Content strategy

Our communication will be developed around five content pillars:

News

- Trends and news
- Participation in conversations on wellness, health, digital technologies and energy topics
- Responses to users: immediacy

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Content strategy

Our communication will be developed around five content pillars:

Products & Results

- Existing products that we are going to improve
- Project results that are going to improve people's life
- Project results that are going to boost Europe's competitive leadership in the era of the digital economy

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Proposal summary

Channel	Role	Goals	Categories	Proposal	Formats	Tone	CTAs	KPIs
	Corporate Communications	Positioning of the project in the sector	• Positioning • Identity Values • CSR • Sustainability • Scientific chievements • Scientific research • Innovation • Accreditations	Communicating useful content to become a benchmark	• Articles • Photo and video • Documents • Infographics	Formal and professional	• Click on the link to read • Register to attend an event	• Reach • Leads generated • Content interaction • Follower growth • ROi • Comments • Video views • Profile visits
	Commercial nature	• Presentation of products and results • Brand recognition • Community building • Identification of audiences	**Health:** • Medical advice • Patient experience • Specific content • World days • Collaboration with communicators **Current events:** • Trends • News and events Participation in social conversation • User feedback **Products:** • Strategics results	• Results communication • Connecting organic and editorial content	• Video and photo Live streaming Stories • Carousel • Fb News	*Commercial* and close, but without losing the professionalism	• More Information • Register to attend an event • Contact us	• Scope • Impressions Interactions • New Followers CPM • Link clicks Likes/comments /interactions/ Sharing on posts • Times shared • Times saved • Video views

Proposal summary

Channel	Role	Goals	Categories	Proposal	Formats	Tone	CTAs	KPIs
	• Direct contact with the user • Immediacy	• Awareness • Notoriety • Diffusion	**Health:** • Medical advice • Patient experience • Specific content • World days • Collaboration with communicators **Current events:** • Trends • News and events Participation in social conversation • User feedback	• Reactive content • Real TIme, both in response to topics being discussed in the topics that are being discussed within the scope of the project, as well as in response to doubts and comments from users. • Amplification of content from other channels Interaction with journalists, brands, disseminators	• Vídeo y foto • Texto • Gif	Commercial and close, but without losing the professionalism	• More information • Read more	• Audience data • Reach • Impressions • Content interaction • New followers • Mentions • Comments • Favorites • Replies • RTs • Shares on posts • Clicks on links • Mentions

6.1 Recommendations for posting on Social Media

All beneficiaries are welcome to contribute to the project's social media activities, but leader of WP7 will be in charge to oversee all the content. On the other hand, each partner is free to post on their organizations and personal profiles.

6.1.1 Twitter

What can you post?

Text of up to 280 characters. This excludes media attachments (photos, images, videos, etc.) and quoted tweets (displaying someone else's tweet within your own) but includes links (a URL is always altered to 23 characters).

How can you use it?

To share short comments, make announcements that can instantaneously reach a large audience or retweet relevant content. You can also use Twitter groups to cluster a group of projects on a similar topic.

6.1.2 Facebook

What can you post?

Text (no character limit), photos, GIFs, videos, links, etc.

How can you use it?

To showcase your project and results in an informal, highly accessible way. Instead of using an individual account, Facebook profile, to share project information, we'd recommend one of these 2 options:

- Facebook page. The most convenient way to promote your project on Facebook, allowing you to post a variety of content including pictures, videos, event invitations or reports, as well as links to presentations or available multimedia material. Facebook pages have fans who like the page, not friends. A page has also the advantage to allow for several nominated users under different types of profiles (admin, editor, reviewer).
- Facebook group. Mostly used for exchanges among members (individuals). Unlike Facebook pages, where only the page administrator can post, anybody previously approved can share content with the group.

6.1.3 LinkedIn

What can you post?

Text (no character limit), photos, GIFs, videos, links, etc.

How can you use it?

A networking site for professionals, it can be used for groups and has established networks on specific topics. Several projects have chosen LinkedIn to create new groups, share content and connect with already established groups.

6.1.4 European Commission social media channels

The social media platforms used by the Commission and its agencies can help us to expand our audience by sharing our posts.

Linking to the European Commission and its agencies:

- Add @HorizonEU and #HorizonEU to your tweets. Be part of the online conversation about Horizon 2020 and your tweets become searchable.
- Tag @EU_H2020 and @KDT_JU in your tweets. Relevant posts are sometimes shared on EU social media account.

7 Market analysis and stakeholder identification

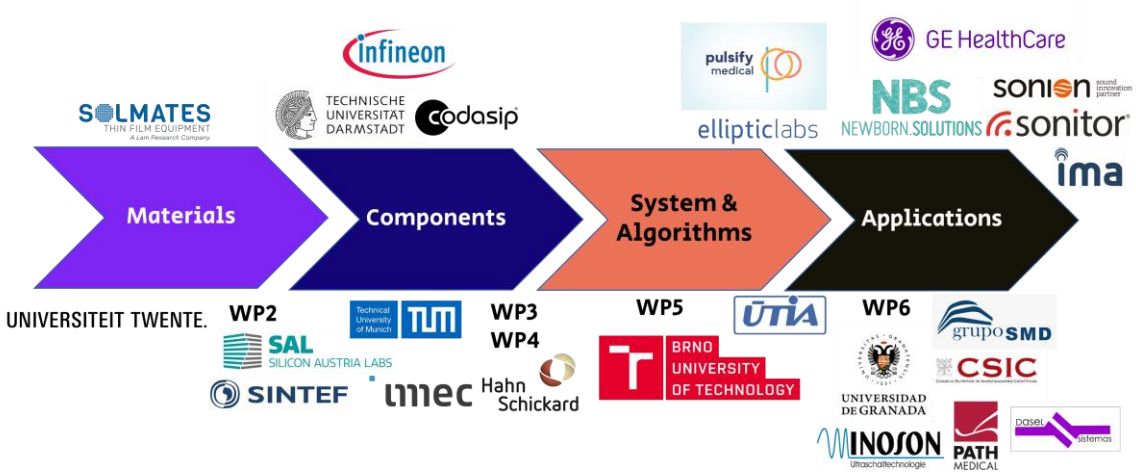

Figure 5: Listen2Future consortium supply chain

The Listen2Future consortium comprises key partners spanning the entire supply chain. It is composed of major industries, semiconductor suppliers, renowned research organizations, and small/medium enterprises with direct market connections through use cases. The consortium's inherent interest lies in bringing the project's results to the market.

The large industry partners will leverage their customer relationship networks and business contacts to inform external partners about important project activities and key technological advancements. Simultaneously, all partners will strive to maintain internal information flow within their own organizations, tapping into the potential of their employees who may have innovative ideas for the project's technological outcomes. The research and university partners, in particular, will engage with high-potential individuals within their student and teaching communities. A participatory approach will be adopted by all partners to share results within the consortium and support activities such as providing industry insights for university exploitation and vice versa.

Given that the project aims to address societal and industrial needs through various Use Cases, a continuous market monitoring system will be implemented to assess evolving needs, changes, and market conditions. This approach aims to unlock the full commercial potential of the project's outcomes. All industry partners have plans for exploiting and implementing the project results, including components, subsystems, and complete systems. Measures will also be taken to protect intellectual property rights (IPR), which fall under the management of WP8. Additionally, the consortium partners will actively seek to establish new partnerships that will foster future collaborations and joint research projects.

7.1 Market analysis

To ensure an approach that aligns closely with the needs of the market and society, the project will incorporate market and stakeholder insights into the exploitation plan and provide updates accordingly. This comprehensive approach will be detailed in D7.5 Exploitation Plan, Results, and Pathway to Impact at the project's conclusion. The aim is to proactively respond to changing market needs and maintain flexibility through a well-defined and monitored market strategy.

Building strong connections with stakeholders, including potential employees, interested individuals, potential users, customers, competitors, and policy makers, is crucial. To enhance project activities, we will actively pursue engagement with platforms such as the "Horizon Results platform," the "Horizon Results Booster," and the "Innovation Radar." These platforms offer opportunities to showcase results, connect with collaboration partners, and receive assistance in developing go-to-market strategies. The importance of ultrasounds is reflected in the medical, industrial, automotive and consumer market (Figure 6, Source: Yole Intelligence 2023, Ultrasound Sensing 2023, YINTR23386).

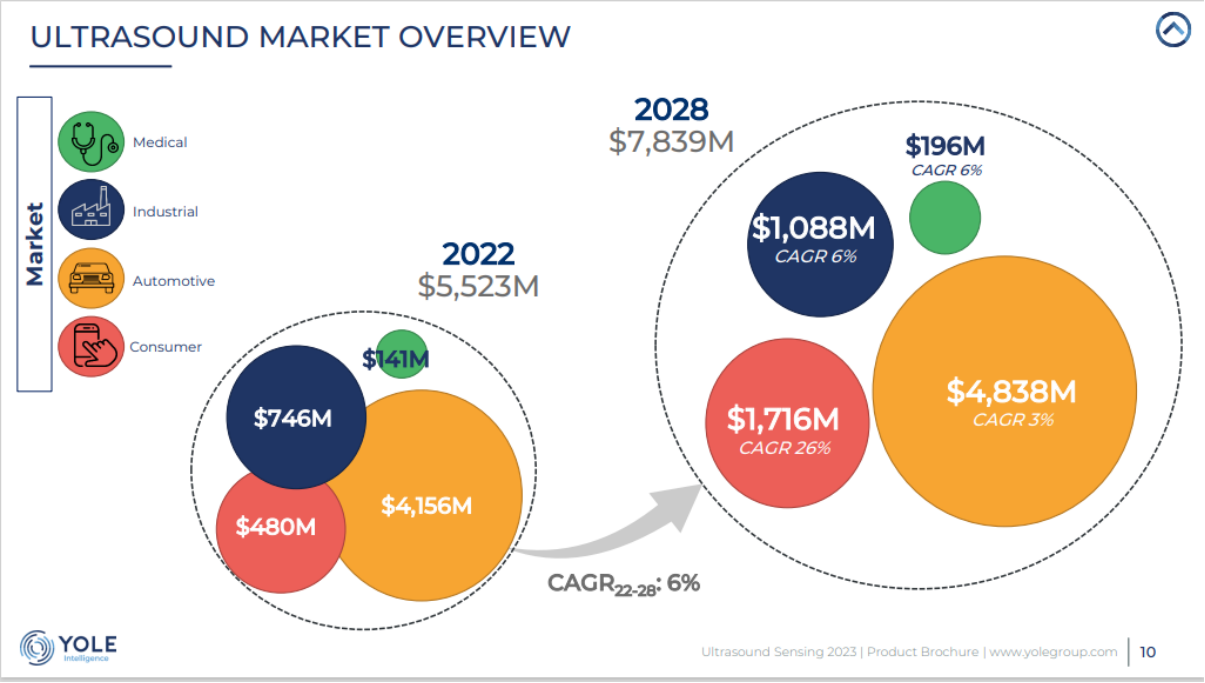

Figure 6: Ultrasound market overview

The projected market size for ultrasound detectors indicates significant growth potential, with an estimated value of $8 billion by 2028. The global ultrasound detector market is expected to expand from $5,523 million in 2022 to $7,839 million in 2028, reflecting a compound annual growth rate (CAGR) of 6% between 2022 and 2028. Currently, bulk piezo technologies dominate the market (Figure 7, Source: Yole Intelligence 2023, Ultrasound Sensing 2023, YINTR23386).

The automotive industry represents the largest segment within the ultrasound detectors market and is anticipated to grow at a CAGR of 3% from 2022 to 2028.

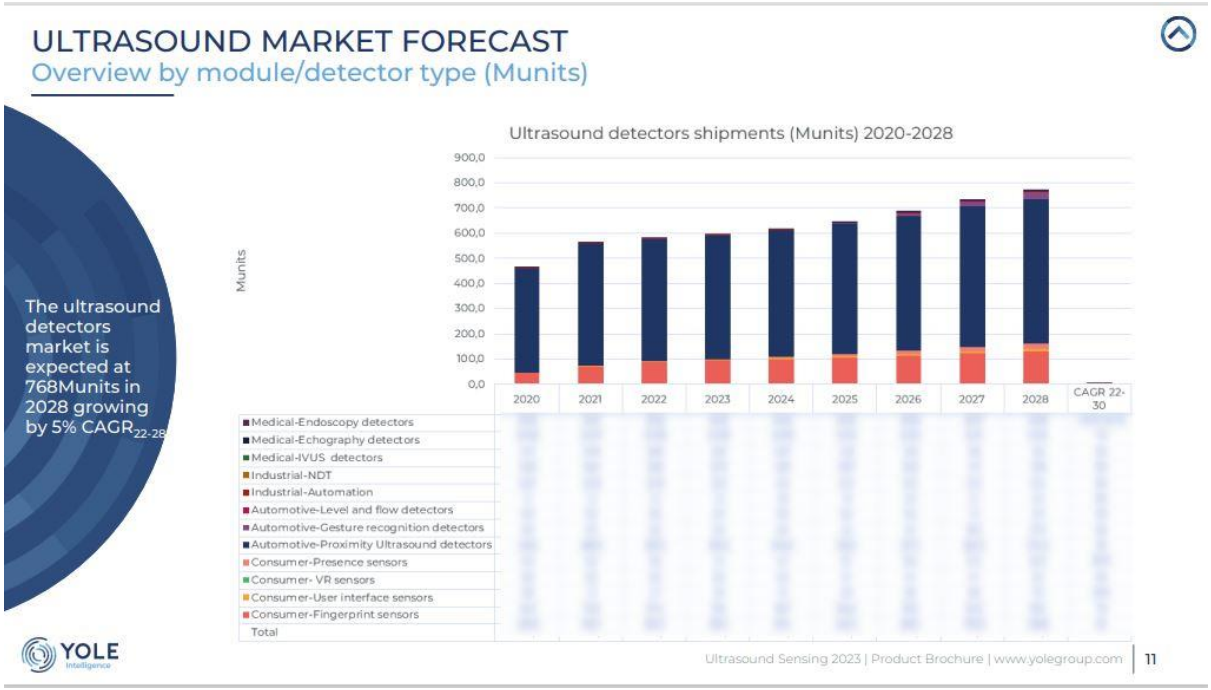

Figure 7: Ultrasound market forecast

The ultrasound detectors market is expected at 768Munits in 2028 growing by 5% CAGR.

Listen2Future is a dedicated initiative that focuses on a particular group of sensor types within the vast field of MEMS Sensors. Specifically, it aims to explore the immense innovation potential of Acoustic MEMS sensors, which are created using piezoelectric thin film transducers for applications such as ultrasound and microphones. By integrating these sensors with intelligent signal processing systems, advanced algorithms, and tailor-made packaging solutions, we can unlock the key to developing highly efficient, low-power, compact, and cost-effective sensors. The primary objective of this project is to advance research in the realm of acoustic transducers, covering both audible and ultrasonic frequencies.

Two core technologies will be addressed: PMIC (Piezoelectric Microphone) and PMUT (Piezoelectric Micromachined Ultrasonic Transducer) (Figure 8, Source: Yole Intelligence 2023, Ultrasound Sensing 2023, YINTR23386).

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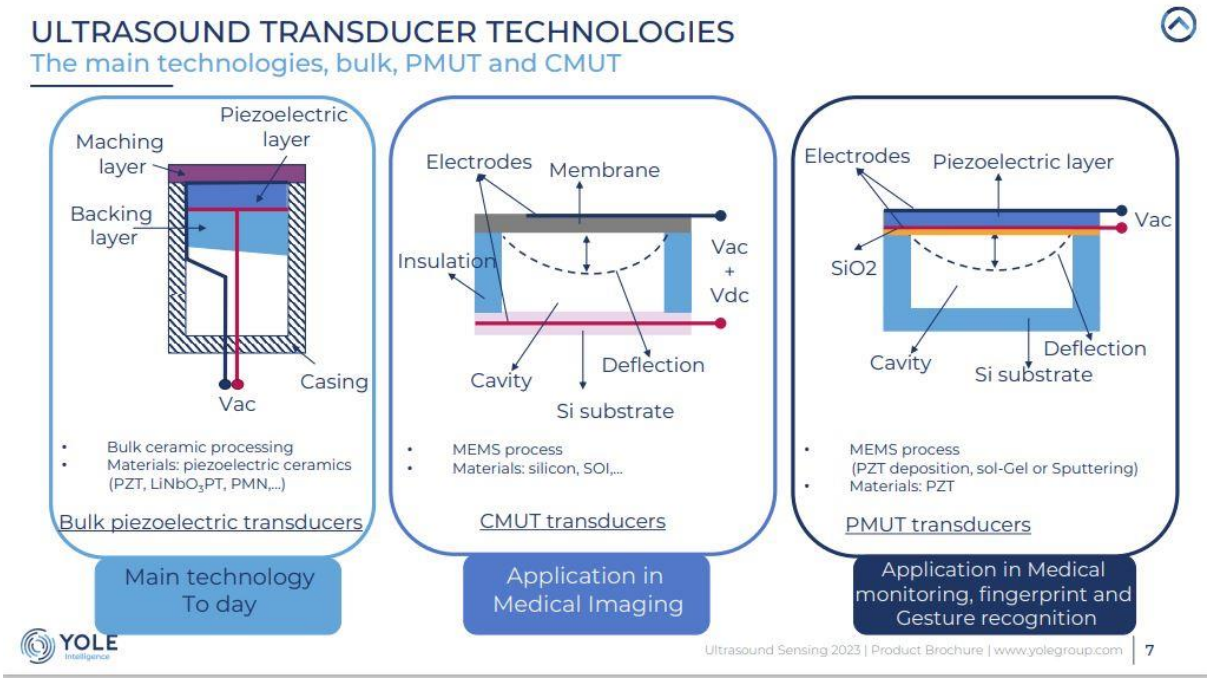


Figure 8: Ultrasound transducer Technologies

PMUT: Ultrasound (discovered 1749) sensing developed fast in the last decades because it's non-invasive and non-destructive nature. So Ultrasound can be used to measure a number of different physical properties, such as particle detection and distance, velocity and imaging. For each of these measurements specific properties of transducers are needed. This market is already established and steadily growing.

PMIC: Capacitive MEMS microphones have been the state-of-the-art type of microphones for many decades for good reason. They are based on readily available semiconductor materials and processes and thus manufactural by very mature process technologies (see the following figure).

Figure 9: Mems microphone market

The following Figure 10 shows the outlook for the ultrasound market from 2023 to 2030, created by Yole Intelligence (Source: Yole Intelligence 2023, Ultrasound Sensing 2023, YINTR23386).

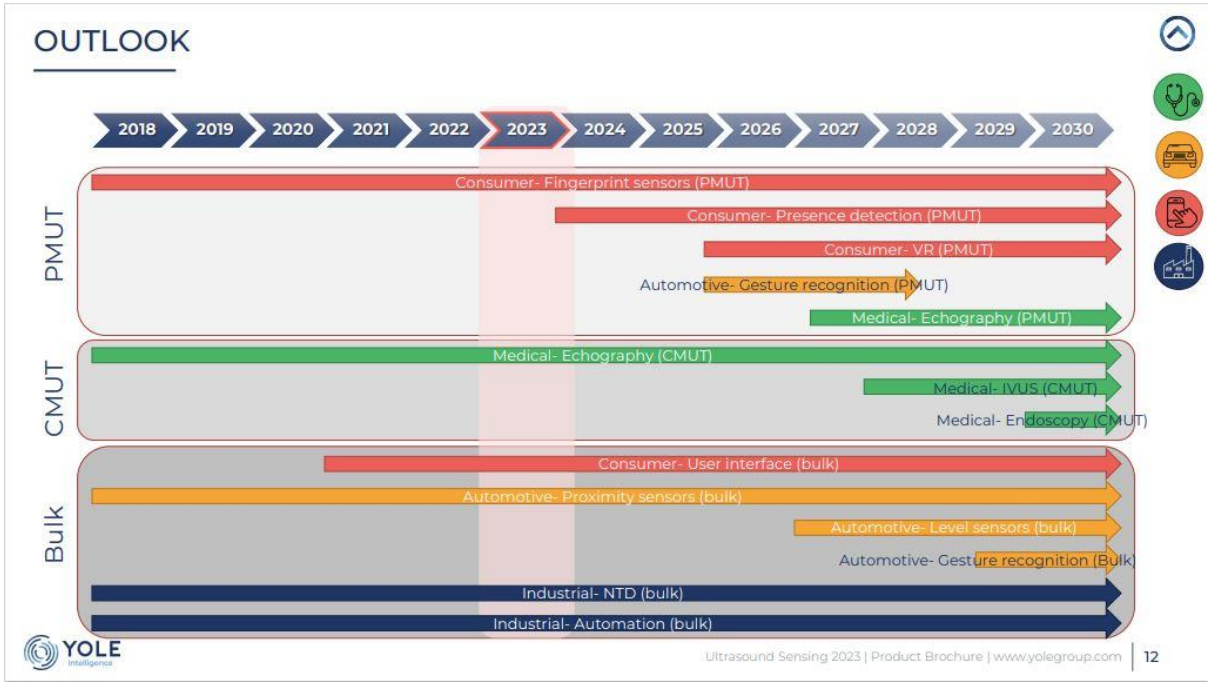


Figure 10: Outlook

7.1.1 Target groups

As the project covers the entire value chain including the research partners on the different levels, the Target Groups (TGs) are heterogeneous. In a first analysis based on consortium assumptions the Target Groups (TGs) of the project are extensive and cross cutting across the quadruple helix. The Quadruple Helix Model of innovation recognizes four major actors in the innovation system: science, policy, industry, and society ("Co-shaping the Future in Quadruple Helix Innovation Systems: Uncovering Public Preferences toward Participatory Research and Innovation" Author: Florian Schütz, Marie Lena Heidingsfelder, Martina Schraudner). The goal of this approach was to identify desirable and productive forms of interaction between the major actors. Potential new target groups will be identified during the project duration.

Scientific Community: research centers and universities interested in analysing new technical and business opportunities in association to the mass production of Piezoelectric acoustic MEMS, or a sub-technology research interest area, such as high-quality thin film development, or comprehensive device testing & evaluation technology. This also includes medical (hearing aid/speakers & ultrasound, micropumps), Automotive (Micromirrors & MEMS microphones), & ICT (inkjet printheads) researchers who are researching emerging application areas due to the piezoelectric MEMS advancements.

Industrial Partners: companies and industrial stakeholder are identified across the entire value-chain of the PMUTs & PMIC technology & applications, also in sectors not touched by the project: (A) Material Providers, such as those organizations who supply piezoelectric thin film material to European industry; (B) Equipment Providers/Tool Vendors, such as those organizations who provide critical supplier components necessary for the deposition process, thin-film manufacturing, or seed layer manufacturer; (C) Industrial End-users that can realize new sensors for Equipment and Material control; (D) Integrated Device Manufacturers (IDM), such as those organizations who vertically integrate design and manufacturing of piezoelectric thin-film applications.; (E) Medical Application partners which are empowered to realize new concepts because of the compactness and efficiency of these new acoustic sensors.

Policy Makers: addressing those interested in EU Health & Safety Legislation (REACH, RoHS), related to the treatment of lead in the production of MEMS devices or electronic waste management regulations (WEEE), plus those working on strategies and legislation associated to the security of supply, resilience and leadership in semiconductor technologies and applications (European Chips Act) and other initiatives to promote democratization of technology as part of the Digital Decade strategy.

Society/End-Users: addressed as the end-users/consumers of the applications realized with acoustic MEMS Sensors concerning the product quality and acceptance. This especially includes patients / patient representatives and comparable organisations (health insurances, care providers).

Table 12: Target groups per partners

Partners	Target groups specific per partners
1. IFAT	Industrial Customers using ASICs for MEMS microphones
2.SAL	GEHC, ELLIPTIC, industrial practitioners, Scientific community
3.GEHC	Clinical users
4.Pulsify	Hospitals, Patients, Doctors, Device manufacturers

5.IMEC	Industrial and medical users, Flat panel display (FPD) manufacturers
6.BUT	Scientific community, university students, industrial end-users
7.UTIA	Industrial end-users
8.IMA	Industrial utilities stakeholders, Building facility management providers
9.IFAG	Industrial users (TWS earbuds or hearing aid)
10.TUM	Industrial users needing robust, low power microphones, Scientific community
11.HSG	Industrial users, all Use-case partners, Scientific community
12.IFD	Industrial users (signal processing of acoustic sensors)
13.TUDA	Scientific community (need for ultra-small force sensor, direction information in acoustic measurements)
14.Inoson	Manufacturers of domestic gasflow meters, industrial gas/air flow sensors and industrial ultrasonic sensors
15.PATH Medical	Doctors, Newborn-Hearing-Screeners, Audiologists (Users of OAE / Tympanpometry equipment)
16.SINTEF	Innovative start-up companies, established system integrators and semiconductor companies
17.ELLIPTIC	Health care providers, alarm companies, retail companies
18.Sonitor	Building owners, service companies, security companies
19.CSIC	Facemasks manufacturers, Filtration material producers
20.DASEL	Non-Destructive Testing (NDT) community, Quality Control Lab, Inline manufacturing composite
21.NBS	Neonatologists, pediatricians and nurses
22.UGR	Practitioners (Bioelectronic medicines, Personal ultrasound), Oncology oriented pharma companies
23.SMD	Practitioners (Bioelectronic medicines, Personal ultrasound)
24.Solmates	MEMS device and RF component manufacturers, Foundries and fabs working with piezo thin films for MEMS, Research institutes
25.Sonion	Hearing Aid companies, project partners optimizing microphone and ASIC in this UC
26.UNITWENTE	Industrial Partners, Scientific community
27.CODA	Designers and developers of custom ASICs

7.2 Stakeholder identification

Our stakeholder interaction is based on the “Innovation Systems Theory,” whereby broader innovation interaction with stakeholders is more likely to lead to economically feasible outcomes. To this end, we are identifying for each stakeholder which type of communication/dissemination/exploitation actions add most value and what the content of the message should be. This is determined by identifying stakeholder’s characteristics, such as their potential influence on or contribution to the project, their interests, and the knowledge they may already have about the technological solutions. In addition, we are actively seeking to understand how stakeholders assess the added value of the project, and we will seek to convince them to share our results within their network.

An initial list of such target groups for L2F is depicted in Table 12. Overall, the dissemination and exploitation strategy is expected to target all directly involved and interested parties. The stakeholders of Listen2Future include the European semiconductor and sensor industries, applied research community, academia and research institutions and policy makers.

We are also identifying potential interested members who could add value on the project developments and indirectly results, exchange good practices and spread the word of the project increasing audience participation in the Listen2Future activities and developments and as an effect the big data community. These audiences are segmented according to the following criteria:

By role:

- Policymakers at EU level
- Organisations and individuals involved in semiconductor research
- A wide range of organisations that may be players and/or catalysts who could be both providers and 'consumers' of information, and might also play additional roles in linking, multiplying advising, and supporting other players in such fields.

By affiliation:

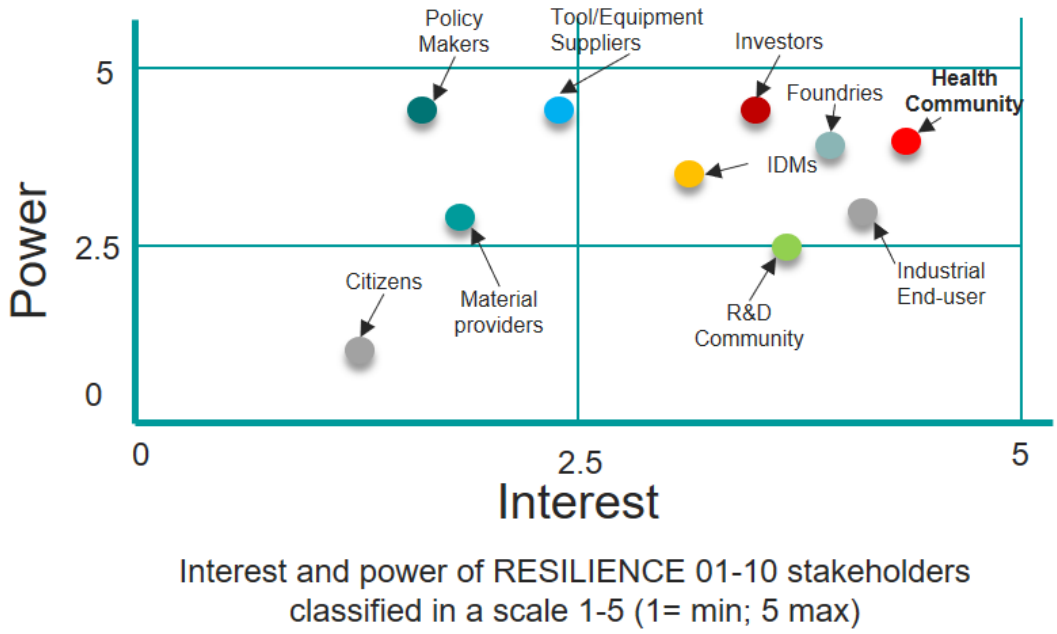
- From public sector or interested parties from industry

By geographic spread/situation:

- From multinational/international through to local levels

By organisation size:

- From large structures through to individual operators



Interest and power of RESILIENCE 01-10 stakeholders classified in a scale 1-5 (1= min; 5 max)

Figure 11: Interest groups

Table 13: Stakeholders identification

Stakeholder group	Interest in the project
European semiconductor and sensor **industries**	• Utilisation of project's results • Strengthened innovation • Training on project's outcomes • Participation in the project's events • Exploitation of project's open-source results • Inspiration for new ideas and applications
Research community and Individuals engaged in research initiatives and/or working in research/academic institutes conducting core or application research in ultrasounds	• Further advancements on ultrasounds applications, as well as on the research through extension / reuse of the project's outputs in the investigated and in other application domains • Inspiration for future research initiatives based on the project's concept and results • Participation in the project's events
Industry Associations & Technology Clusters	• Inclusion of project's results to collaborative research activities • Dissemination of project's results to their members • Bilateral participation in events for knowledge exchange

Participants, project partners and relevant stakeholders active in **Horizon Europe**	• Identification of common topics • Synergies and collaborations for results promotion • Enhancing innovation through results combination • Co-organisation of events • Research Agenda formulation
Policy-makers (at any level like EC Directorates and Units, Ministries and Governments, Regulatory Agencies)	• Evaluation of the project's Social-Technological-Economic-Environmental-Political (STEEP) aspects • Definition of future research and innovation directions for the EC initiatives, considering the project's acquired knowledge and experience • Inputs for standardization activities
Potential users of the applications	• Different users for the applications from the use cases, ranging from newborns to elderly people to industrial application end-users

8 List of Abbreviations

Abbreviation	Description
CDMSP	Communication, Dissemination, Market & Stakeholder Plan
ECS	Electronic Components and System
MEMS	Micro Electro Mechanical Systems
SCO	Strength, Challenges and Opportunities
TG	Target Group
WP	Work Package

9 Bibliography

Ruby, D. (10th July 2023). 49 Podcast Statistics That Really Matter. Damandsage. https://www.demandsage.com/podcast-statistics/

European Commission (2020)**.** Directorate-General for Research & Innovation. H2020 Programme. Guidance. *Social media guide for EU funded R&I projects.* https://ec.europa.eu/research/participants/data/ref/h2020/other/grants_manual/amga/soc-med-guide_en.pdf

European Commission (5th June 2023). *Communicating your project.* https://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/communication_en.htm

European Commission (5th June 2023). *Dissemination & exploitation of results.* https://ec.europa.eu/research/participants/docs/h2020-funding-guide/grants/grant-management/dissemination-of-results_en.htm

EU science & Innovation (2017). *Horizon 2020 communication, promote your project and success - The EU Guide to Science Communication*. Youtube. https://www.youtube.com/watch?v=0JbLCd-7u7g&list=PLvpwljZTs-Lhe0wu6uy8gr7JFfmv8EZuH&index=2

Radiolab UGR (10th July 2023). https://medialab.ugr.es/radiolab/

Schütz, F., Heidingsfelder, M. L., & Schraudner, M. (2019). *Co-shaping the Future in Quadruple Helix Innovation Systems: Uncovering Public Preferences toward Participatory Research and Innovation*. She Ji, 5(2), 128-146. https://doi.org/10.1016/j.sheji.2019.04.002

Yole Intelligence Group (2023). *Ultrasound Sensing 2023*. https://www.yolegroup.com/product/report/ultrasound-sensing-2023/