WP9 – Dissemination, Exploitation and Communication

D9.2 – Dissemination and Communication plan (initial)

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Summary

This deliverable is the first version of the plan describing the Dissemination and Communication activities to be carried out within Work Package 9 of the MERGING project. The present plan will be further revised, based on the same structure, at month 30 (D9.3, Dissemination and Communication Plan – revised, where all activities will be assessed for effectiveness and revised where necessary), and finally at month 42 (D9.4 Dissemination and Communication Plan – Final). The final version will include a full report on the Dissemination and Communication results, and the planned actions to sustain dissemination and knowledge sharing beyond up to four years after the end of the project, as per article 29 of the Grant Agreement and per the DG Jean-Eric Paquet dedicated letter to all H2020 projects on 15 April 2021.

Executive summary

The deliverable D9.2 focusses on the Communication and Dissemination activities of the MERGING project, within the dedicated work package (WP9). It covers two major areas: **Dissemination**, focussed on the disclosure of project results to specific target groups, and **Communication**, aimed to promote the project and its impacts to wider - although still well defined - audiences. For each activity area, it describes: the goals, the targeted audience, the activities carried out from the project start to M18, and the planned activities for the rest of the project. Finally, it includes a section on collaborative activities with other H2020 projects funded by the same call, and a section on the evaluation criteria that will be used to re-asses and update the plan in two further iterations during the project, at M30 and M42 respectively.

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1. Introduction

1.1. Scope

The present document is the initial version of the Dissemination and Communication Plan for the MERGING project. It focusses specifically on:

- Expanding and refining the preliminary plan described in the project proposal
- Reporting on the actions carried out so far since the beginning of the project.

For both Communication and Dissemination, this document details the objectives, the key messages, the target audiences, the tools and actions already used and foreseen (website, social, leaflet, videos, press releases, journal publications, conference presentations, etc.) and a timeline of how they will be used to reach the desired goals.

A specific section is devoted to collaboration on communication and dissemination with the other projects funded under the same call than our project, i.e. H2020-NMBP-TR-IND-2018-2020 (Transforming European industry), under the topic DT-FOF-12-2019. Thus, a successful collaboration with the three other projects, in particular, has started during the period covered by this document (see section 4). The importance of such collaborative efforts is expected to grow over the rest of the project's duration, with beneficial synergies influencing not only the communication and dissemination impact of this project, but of the whole H2020 research topic.

In the 5th section, evaluation criteria (KPIs) for determining the success of the dissemination and communication actions are discussed. This will be especially relevant for the revision of the plan at M30, and for its final assessment at the end of the project.

1.2. Definitions

In this plan, the terms "Dissemination" and "Communication" are used according to the prevalent definitions used by the European Commission with respect to Research and Innovation projects[1]. A brief reminder of the scope of the two terms follows.

Dissemination is defined as *the public disclosure of the results by any appropriate means, including by scientific publications in any medium.* It is focussed on **project results only**; it is addressed to audiences that may use the results in their own work e.g. peers (scientific or the project's own community), industry and other commercial actors, professional organisations, policymakers, etc., and it aims to *enable use and uptake of results.*

Its overall goals are:

- transfer of knowledge and results to the ones that can best make use of it;
- maximize the impact of research, enabling the value of results to be potentially wider than the original focus;
- ensure Open Access to publications (an underlying principle in H2020).

[1] https://ec.europa.eu/easme/sites/easme-site/files/h2020_energy_info_days_communication_dissemination_and_exploitation_presentations_all.pdf

Communication is instead defined as the set of activities that focus on both the project itself and the results, that are addressed to multiple audiences beyond the project's own community (including the media and the public) and that aims to inform and reach out to society to show the benefits of research.

2. Communication

2.1. Objectives

The following Objectives for Communication were defined in the Project Proposal.

- (O1) to involve young minds into digitisation, namely in the development of digital manufacturing technologies and their importance and impact onto the economy and society
- (O2) to promote gender equality, integrate gender dimension in R&I activities, promote career opportunities in robotics and manufacturing
- (O3) to achieve societal endorsement linked to R&I on digital manufacturing
- (O4) to achieve support of industry potentially open to the adoption of **MERGING** technology and solutions for the project, and for future initiatives linked to robotic solutions for manufacturing
- (O5) to mobilise the European Research Area for the adoption of knowledge generated in the project for the development of new technologies and applications
- (O6) to raise awareness among EC, Public Authorities and Policy Makers to foster cooperation in spreading the benefits of robotics manufacturing and contributing to regulatory process.

The six objectives listed above can be turned into operative principles for preparing content and guide the selection of Key messages for communication (see following paragraph). This means that the MERGING communication actions and products must put particular emphasis on:

- countering the perception that automation is associated to job loss, by highlighting the human/robot collaborative potential of solutions for soft objects manipulation;
- presenting robotisation as a beneficial, and ultimately more ethical and sustainable, alternative to job displacement towards low-wages country, in particular in sectors such as the textile industry where the problem is relevant and affects the public perception;
- framing the project as part of an overall European strategy for competitive, resilient and sustainable manufacturing, made even more urgent by the impact of the COVID-19 pandemic;
- providing lay audiences with the necessary technical background to capture the importance and innovative content of this technological effort;
- informing timely about the project's results, and insert these information in the news cycle so that they can be picked up by the news media.

2.2. Key messages

The first step for a communication strategy is to define key messages that have to be conveyed through various media, and that should stick with the audience after any encounter with the project's communication. This is fundamental in order to achieve consistency in the communication.
The preliminary plan included in the project proposal outlined some general messages regarding:

KEY MESSAGE 1:
The relevance of MERGING results in our daily life.
KEY MESSAGE 2:
The relevance of MERGING project in jobs creation, energy efficiency, citizen's security and life quality.
KEY MESSAGE 3:
The MERGING project results and its impact beyond robotic industry.
KEY MESSAGE 4:
(The potential for) Collaborating with robots and contribution to job quality improvement.
KEY MESSAGE 5:
Career opportunities for women in robotics and automation derived from MERGING results.

These general messages can now be declined more precisely, in the form of brief statements / content points that can be used as "building blocks" in communication materials, presentations, press releases etc., and in general guide the communication.

KEY MESSAGE 6 (technology focus) :
MERGING will pioneer the use of robotics and Artificial Intelligence for manipulating flexible and fragile objects.
KEY MESSAGE 7 (areas of application) :
The solutions will be tested in the textile, food and transport industries, but will have potential for other industrial sectors.
KEY MESSAGE 8 (main expected outcome) :
MERGING aims to design a versatile, low cost and easy-to-use robotic solution that manufacturers can apply to support or automate tasks involving the handling of flexible or fragile objects.
KEY MESSAGE 9 (technology building blocks) :
The solution will consist of a new robotic dexterous gripper taking advantage of an integrated adaptive electro-adhesive skin. Control will include dedicated perception and supervision functions to adapt the system's response to the environment and to the object's behaviour, and abilities to make the human-robot or multi-robot co-manipulation of the flexible object safer, using Artificial Intelligence like Machine Learning.
KEY MESSAGE 10 (consortium) :
MERGING is a three-and-a-half years project coordinated by CEA (Commissariat à l'Energie Atomique et aux Energies Alternatives) in France, and involving academic and industrial partners from five countries.
KEY MESSAGE 11 (partners' role) :
The specific role of each individual partner in the project (relevant at the national/local level) is clearly defined.

2.3. Target audiences

The preliminary plan outlined in the project proposal already defined the most relevant target audiences for MERGING, namely:

- **Young Minds** (i.e. students)
- **Stakeholders** (industrial clusters and associations) :
  Examples: EFFRA, EuRobotics, Euratex/ETP Fibres Textiles Clothing, Text4IM, ERTRAC, ACARE, International Federation of Robotics, EUROPEN, etc.
- **Workers** (i.e. in particular those in the sectors where soft manipulation is relevant)

- **European Research Area** (i.e. the general scientific community in Europe, who should be made aware of the potential for research and innovation in this sector)
- **Women** (i.e. in relation to the under-representation of women and gender imbalance in the engineering sector) :
  European Platform of Women in Science (EPWS), European Association of Women in STEM (WITEC)
- **Public in general**

This list remains valid, with the addition of :

- **Media**

(i.e. journalists on print, online, Tv and radio, in particular those specialising in technology, AI, robotics, business and industry) :
Although the media can also be seen as a vector to reach targeted audience mentioned above, effectively engaging media professionals requires treating them as a separate audience with its own need and specificity.

2.4. Tools and actions

The MERGING communication plan leverages the following principal communication tools and actions :

- Public website
- Leaflet
- Presentations at public events promoted by industrial associations
- Publication of project information in EC platforms
- Publication of project information in national networks for research and innovation
- Press releases
- School visits to partners' facilities
- Joint initiatives with European associations for gender balance in science
- Short videos
- Project video
- Social network profiles and information publication

The following table presents an updated timeline of how these actions and tools are planned to be deployed over the course of the project in order to convey the key messages listed in section 2.2 to the key audiences listed in 2.4.

Action/tool	Target Audience	Key Messages	Timing
Website	Stakeholders / European Research Area / Public in general	2, 4, 6-10	M2 – M18
Website	All	2, 4, **5,** 6-10	M18-M30
Website	All	All	M30-M42
Leaflet	Stakeholders / European research area / public in general	2, 4, 6-10	M18-M42
Presentations at public events promoted by industrial associations	Stakeholders / European research area	2, 3, 4, 6-10	Up to M18

Action/tool	Target Audience	Key Messages	Timing
Presentations at public events promoted by industrial associations	Stakeholders / European research area	2, 3, 4, **5,** 6-10	M18-M30
Presentations at public events promoted by industrial associations	Stakeholders / European research area	All	M30-M42
Publication of project information in EC platforms	Stakeholders / European research area	All	M18 onwards
Publication of project information in national networks for research and innovations	Stakeholders, researchers, public in general	All	M18 onwards
Press releases	Media (and stakeholders / public in general via the media)	6-11	M1-M18
Press releases	Media (and stakeholders / women / public in general via the media)	All	M18-M42
School visits to partners' facilities	Young minds	1-5	M24 onwards*
Joint initiatives with European associations for gender balance in science	Women, Public in general, stakeholders	5	M24 onwards
Short videos shared via YouTube/website/social networks	Young minds, public in general, women	All	M18 onwards
Project final video	Young minds, stakeholders, European Research area	2, 4, 6-9	M40
Social media profiles (LinkedIn, twitter) and information publication	Stakeholders, Workers, European Research area, Women	All	M6 onwards

**depending on COVID-19 restrictions being lifted*

A more detailed description of each tool/action is presented in the subsections below, including how they have been used over the first 18 months (where applicable) and plans for future use.

2.4.1. Public website

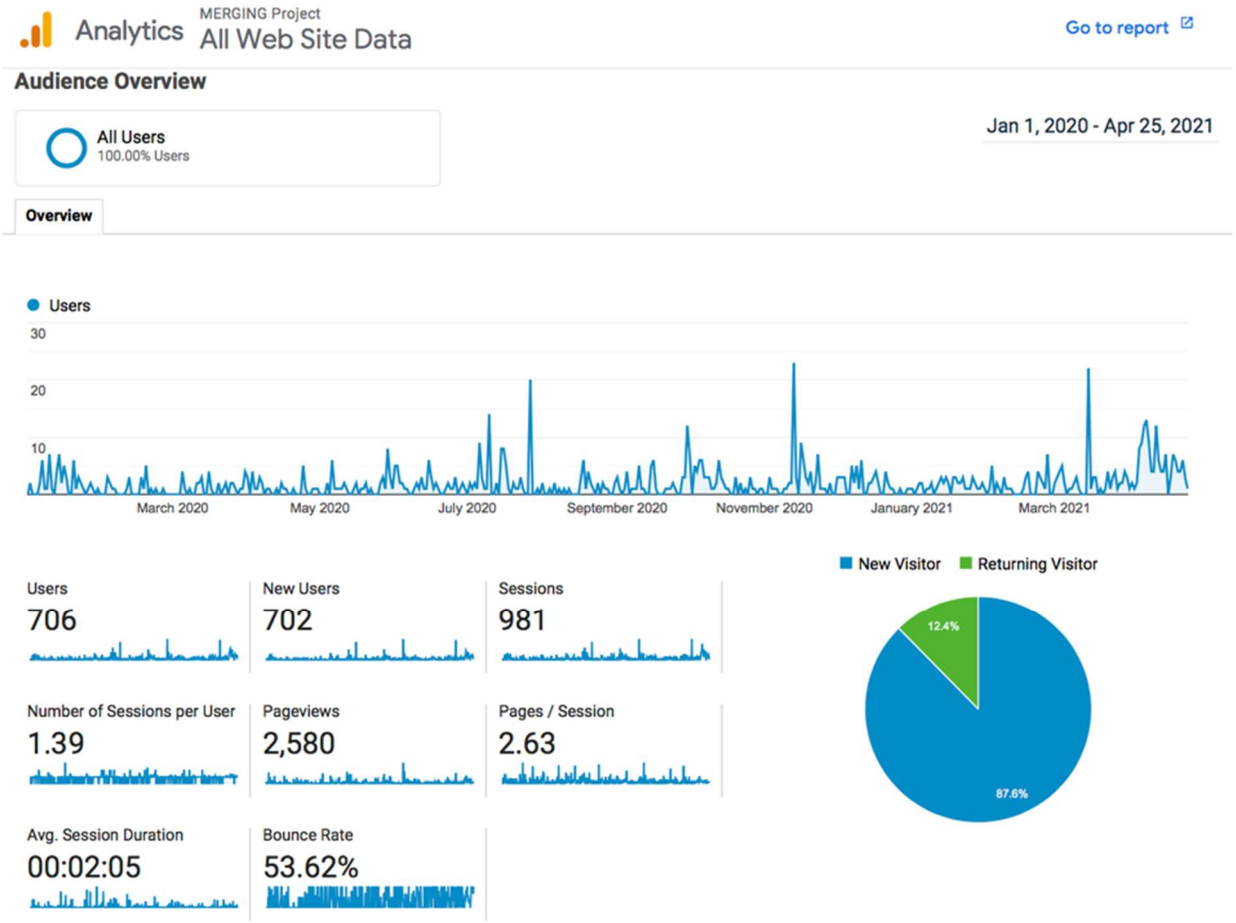
The main objective of the MERGING Public Web Portal is to promote the MERGING project via Internet. The aim is to achieve worldwide dissemination of the knowledge of the project, to publish news and information and to enable the communication between the project coordinator and everyone who is interested in the project. It was primarily developed for any person who wants to be informed for the content and the achievements of the MERGING project. The MERGING public web portal can be reached at the link: http://www.merging-project.eu/. This portal has been developed and is being maintained by Merging partner n° 2, i.e. the Laboratory for Manufacturing Systems and Automation (LMS) of University of Patras (Greece). It is based on the open-source WordPress. WordPress is a flexible Content management/Portal solution that is easy to install, use, extend and maintain. A complete description of

the structure and technical aspects of Merging website is provided in deliverable D 9.1 – Public website. It has been launched online by the end of Month 2 (December 2019).

Over the course of the first 18 months, the website has been used to present :

- the project's overall concept;
- the composition of the consortium and the role of each partner in the project;
- the structure (title and main topic of each WP) as well as the status of the main technical WPs that are ongoing or already completed;
- an overall presentation of the project in the form of a news story/press release that serves as reference extended description;
- news items about events, in particular presentations at conferences and workshops;
- the project leaflet, that can be downloaded from the website.

An overview of the traffic analytics for the first 18 months is shown in the figure below (from Google analytics):



General presentation of MERGING has been also included on the CEA-LIST website in French : http://www-list.cea.fr/recherche-technologique/programmes-de-recherche/manufacturing-avance/robotique-collaborative/59-robotique-collaborative.

2.4.2. Leaflet

A six-page leaflet was developed by EPFL, with collaboration from all partners. The leaflet presents the overall concept and fields of application, the technology building blocks, the use cases and the composition of the consortium. Texts and images were extensively discussed in several WP9 meetings. The leaflet can be downloaded from the website and is presented in Annex A.

2.4.3. Presentations at public events promoted by industrial associations

The main associations to be targeted by this action line include EFFRA, EuRobotics, Euratex/ETP Fibres Textiles Clothing, Text4IM, ERTRAC, ACARE, International Federation of Robotics, EUROPEN, etc.
This action line covers both Communication (focussed on the project itself) and Dissemination (focussed on result, see section 3).

2.4.3.1. Realized actions

For what concerns Communication during these 18th months, an opportunity to present the project was created and leveraged at the **European Robotics Forum 2021** organised by EuRobotics, which took place virtually from 13 to 15 April 2021, with over 800 registered participants.
Already in the 1st MERGING General Assembly meeting (in July 2020), following a suggestion from the Project Officer, the consortium started planning the organization of a **common workshop with the other 2 (later, 3) projects** funded under the same topic ("Handling of flexible materials"): APRIL, REMODEL and SOFTMANBOT. In November 2020, MERGING Consortium selected the European Robotics Forum 2021 as the most suitable venue. In parallel, from October 2020, SOFTMANBOT reached out to MERGING and to REMODEL to propose an internal discussion/have a round table discussing common topics, issues, solutions and way forward.
On our initiative, the four projects met online, agreed to combine the two ideas and collaborate in preparing a Workshop proposal for the European Robotics Forum, with the following outline:

- Joint workshop on "Soft robotic manipulation for the future of European factories" with the SoftManBot – Remodel – April projects, together with MERGING.
- Objectives: get to know each other, and have the opportunity to communicate and exchange, together and with the European robotic community, about fundamental needs in robotic developments and challenges, and eventually identify possible common technical work with our four projects.
- Format: Discussion style workshop / Presentation-oriented workshop
- Duration: 90 minutes (20' per project + 10' discussion)

The proposal was submitted to ERF by the 15 January 2021 deadline. It was accepted and the workshop was scheduled for 13 April, 11:20 CET (see the ERF programme at the following link: https://www.eu-robotics.net/robotics_forum/programme/programme/index.html). The final agenda and abstract is presented below:

TITLE : *Soft objects robotic manipulation for the future of European factories*

MOTIVATION, OBJECTIVES, EXPECTED OUTCOMES
The handling of soft materials with robots will play a significant role in the factories of the future. The European Commission launched a dedicated call, under which four projects have been funded

between 2019 and 2020 and are now working on the robotic manipulation of soft objects, which presents many scientific and technological challenges. Use cases from the textile, electric, toy and food industries will be presented, describing current industrial situation, needs and specificity of a robotic cell, technological challenges and proposed approaches, and elements that can be applied to other cases. A final roundtable will discuss the changes in relative function and place of humans and robots in future European factories, and possibilities for standardization.

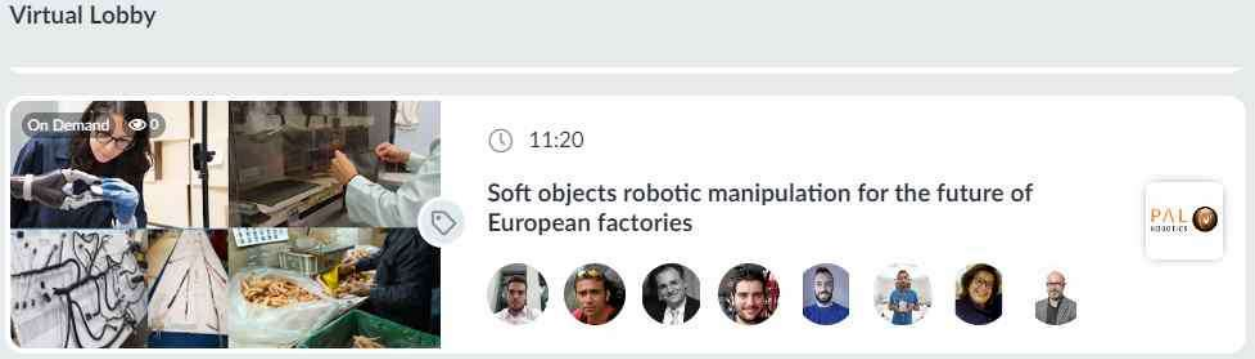
AGENDA :
11:20 : The Factories of the Future
Welcome and introduction from José Carlos Caldeira, Honorary Board Member, *EFFRA - European Factories of the Future Research Association*
11:25 : Robotic manipulation for the textile industry: the MERGING project
Dionisis Andronas, project technical manager of MERGING
Current industrial situation - needs and specificity of a robotic cell in this use-case - technological challenges and proposed approach - elements that can be applied to other cases.
11:40 : Robotic manipulation for the food industry: the APRIL project
Xenia Beltran, project coordinator of APRIL
Current industrial situation - needs and specificity of a robotic cell in this use-case - technological challenges and proposed approach - elements that can be applied to other cases.
11:55 : Robotic manipulation for the electric industry: the REMODEL project
Gianluca Palli, project coordinator of REMODEL
Current industrial situation - needs and specificity of a robotic cell in this use-case - technological challenges and proposed approach - elements that can be applied to other cases.
12:10 : Robotic manipulation for the toy industry: the SOFTMANBOT project Juan Antonio Corrales Ramón, project technical manager of SOFTMANBOT
Current industrial situation - needs and specificity of a robotic cell in this use-case - technological challenges and proposed approach - elements that can be applied to other cases.
12:25 : Final roundtable, questions and answers
Moderators: Marco Controzzi (Principal investigator, APRIL project), Leonard Engels (Dissemination manager, APRIL), Nicola Nosengo (Dissemination manager, MERGING project)
Synergies between the four projects; opportunities for standardisation; how the function and place of humans and robots will change in future European factories;

Information about the workshop was distributed through various communication channels, in order to maximise attendance:

- A news item was published on the CORDIS website, using the WIRE tool for contributions from H2020 projects (see also section 2.4.4) : https://cordis.europa.eu/event/id/148884-erf-2021-workshop-on-soft-objects-robotic-manipulation-for-the-future-of-european-factories.
- The MERGING Twitter and LinkedIn profiles (see section 2.4.11) each published 2 posts about it, ahead of the event in addition to re-posting the information from the other 3 projects' profiles (a common presentation text had been agreed upon in advance). CEA LIST and Shadow Robot also posted information about the workshop from their own Twitter and LinkedIn profiles. During the event, the MERGING Twitter profile was used for live-tweeting highlights from individual talks.
- CEA-LIST promoted the even through its website http://www-list.cea.fr/medias/agenda/icalrepeat.detail/2021/04/13/211/-/- and through two posts on LinkedIn and Twitter, both translated in English and French, reaching a combined audience of 692 (on LinkedIn) and 2750 (on Twitter) followers.

- Shadow posted information on the even on social media, promoted it in company-wide email signature and sent out a newsletter to over 8,000 subscribers

The workshop was attended by about 125 participants (speakers included), representing higher education institutions, large companies, SMEs, Research and Technology Organisations. A complete list of participants, including affiliation and contact information is available but cannot be included in this public deliverable for privacy reasons. The workshop remains available for on-demand viewing (video record) on the event's platform at the workshop's page, for ERF 2021 registered participants only.



This line of action will be continued in the future, and we plan to propose similar workshops at next editions of the European Robotics Forum (2022, 2023) as well as to IROS 2022. Because the next workshops are likely to present technical and scientific results in addition to the projects concepts, they are discussed in section 3 of this report.

2.4.3.2. Planned actions

Additional participations at public events are forecasted by individual Merging project partners (the following list will be updated and expanded with the M30 version of the plan).

Event type	Timing	Audience	Partner involved
Participation to national research group events (GDR Robotics - Workgroup : Multiscale manipulation)	2021	French robotics researchers (scientific, customers)	CEA
DigiHall days* (forecasted at CEA premises, probably moved to virtual event)	June 2021	French industrial, stake holders, partners (customers, scientific, investors, media)	CEA
Swiss Robotics Day	2021-2022	Swiss robotic industry, scientific community, general public	EPFL

**depending on COVID-19 restrictions being lifted*

2.4.4. Publication of project information in EC platforms

The CORDIS website of the European Commission includes a news section that publishes summary of project results as well as important updated on H2020 projects, and allows projects to post updates

through the WIRE service, where articles can be submitted, are vetted by CORDIS's editorial team and then published.

This opportunity was used in April 2021 to advertise the workshop described in section 2.4.3.1. : https://cordis.europa.eu/event/id/148884-erf-2021-workshop-on-soft-objects-robotic-manipulation-for-the-future-of-european-factories

This tool will be further used in the following months to highlight specific aspects of the projects. The following milestones can be used for scheduling the CORDIS articles.

Topic	**Timing**
The MERGING project is nearly halfway	M18
Demonstration of the perception system	M28
Demonstration of the gripper and skin	M29
Demonstration of Robot control	M33
Final results	M42

2.4.5. Publication of project information in national networks for research and innovations

CEA has already (to advertise the workshop described in section 2.4.3.1.), and will continue, leverage the communication network of Réseau C.U.R.I.E., that in France federates the professionals active in innovation, valorisation and technology transfer related to publicly-funded research. It gathers 190 institutions including universities, hospitals, research institutes, exploitation entities of the public research, INPI, IP practice, SMEs and large industries, and its communication network reaches several thousands of people.

From M19 (May 2021), information about MERGING will be included in Réseau C.U.R.I.E.'s newsletters; press releases will be targeted specifically at its members network; information will be disseminated through their social network profiles and through their public website. The table here below shows a tentative timing of such actions.

Action	**Timing**	**Target audience**
Information on MERGING-related events in Réseau C.U.R.I.E. Newsletters and social networks	every 6/12 months	more than 190 French research institutional members (French research universities, institutes, exploitation entities of the public research, INPI, IP practice, SMEs and large industries)
Press releases - Members of Réseau C.U.R.I.E.	Every 12 months	French public, medias, industrial, stake holders, investors, customers
Innovation news - Réseau CURIE on Twitter, Linkedin and Facebook	depending on the results	professional and public audience
Innovation news - Réseau CURIE's large public website	depending on the results	French public
Innovation news - Réseau CURIE's professional website	depending on the results	French industrials

2.4.6. Press releases

An initial press release was prepared, upon request by members of the consortium, and published on the website in early 2020. The text has also the function to provide all partners with a reference text to be used for adapting individual press releases in other languages and aimed at national/local level media relations. The press release is available on the website here :
http://www.merging-project.eu/european-funded-project-aims-at-creating-a-robotic-platform-that-can-manipulate-soft-materials-in-industrial-environments/

Additionally, AIMEN and Selmark prepared a Spanish-language press release (http://aimenweb.ayco.net/sala-de-prensa/noticias?p=2) highlighting their role in the project, that resulted in 2 articles at the national level (ABC, EFE) and 8 articles at the regional media level.

CEA-LIST also distributed a press release on the MERGING project in French and English, and posted it on its website (http://www-list.cea.fr/medias/toute-l-actualite/2021/502-30-avril-2021-merging-un-projet-europeen-coordonne-par-le-cea-list-pour-la-manipulation-d-objets-flexibles-en-robotique & http://www-list.cea.fr/en/media/news/2021/502-april-30-2021-merging-an-european-project-coordinated-by-cea-list-for-the-manipulation-enhancement-through-robotics-of-flexible-objects).
CEA-LIST distributed it also on LinkedIn profile both in French (https://www.linkedin.com/feed/update/urn:li:activity:6793901601988874240/) and in English (https://www.linkedin.com/feed/update/urn:li:activity:6793902524706418688/), and on Twitter's one in French (https://twitter.com/CEA_List/status/1388138268445843457) and also in English (https://twitter.com/CEA_List/status/1388138935726092290).

Future press releases will be issued with the following timing (some of the topics overlap with the CORDIS articles in section 2.8, but texts will be slightly adapted).

Topic	**Timing**
The MERGING project is nearly halfway	M18
Soft objects manipulation for the European textile industry*	M24
Demonstration of the perception system	M28
Soft objects manipulation for the European food packaging industry*	M28
Demonstration of the gripper and skin	M29
Soft objects manipulation for the European automotive industry *	M32
Demonstration of Robot control	M33
Final results	M42

**these three press releases will not include yet detailed results from the use cases, nor confidential information, and aim to result in articles and stories highlighting the economic potential of automation in the respective sectors and a high-level view of the MERGING approach in each specific area.*

A mailing list has been prepared for distributing the press releases, with over 30 selected contacts (not included here for privacy reasons) from publications including:

- AgriTrade news
- Digital Labels & Packaging magazine
- Manufacturing & Engineering Magazine
- New Electronics
- Food & Drink Technology
- Food Navigator

- Advanced Manufacturing – The Engineer
- The Manufacturer
- Industrie & Technologies
- Science & Vie Junior
- L'Esprit Sorcier
- Reseau c.u.r.i.e
- SwissInfo
- IEEE Magazine
- Wired
- the Economist
- AgriTrade news
- Digital Labels & Packaging magazine
- Manufacturing & Engineering Magazine
- New Electronics
- Food & Drink Technology
- Food Navigator
- Advanced Manufacturing – The Engineer

Further articles at the national/regional level highlighting the role of individual partners will also be prepared. Those foreseen at the moment include in particular:

Topic	Publication	Timing
Opteamum's activity and small focus on the participation in the H2020: Merging project	L'Usine Nouvelle	2021/2022
Description of Opteamum's research and participation in the H2020: Merging project	Républicain Lorrain	2021/2022

2.4.7. Joint initiatives with European associations for gender balance in science

Starting from M24, MERGING will start liaison with associations such as the European Platform of Women Scientists (https://epws.org/) or the European Association for Women in Science, Technology, Engineering and Mathematics (STEM) (https://www.witeceu.com/) to develop joint initiatives on women in robotics, possibly involving the other 3 projects involved in the same H2020 research topic APRIL, REMODEL, SOFTMANBOT.

The activities proposed can include:

- Profile of women scientists/engineers working on the MERGING research topic for the EPWS website;
- A joint Twitter campaign to launch on the International Day of Women and Girls and Science (11 February) to counter gender bias & stereotypes in robotics, to be repeated in 2022 and 2023.

2.4.8. School visits to partners' facilities

These activities, delayed due to the COVID-19 pandemic during the first 18 months of the project, will hopefully start in the school year 2021/2022 (if the health situation allows). Projects partner will contact

schools in its area (targeting students ages 14-19 y.o.) aiming to organise at least one visit to its premises during the school year, providing students with a general presentation and "invitation" to the topic of robotics and AI, and a technology demo focussed on the MERGING technologies. The aim is to organise for the entire consortium at least 5 visits overall over the next 2 school years, involving more than 300 students.

2.4.9. Short videos

In the remaining timeline of the project (probably around 2022-2023), short (1'-2') interviews will be recorded with consortium members to highlight specific aspects of the project (from accessible explanations of its technical aspects to its potential impact, as well as the societal and ethical aspects related to research on robotics and automation).

A list of potential interviewees from various partners has been prepared and will be used for producing the interview starting from M24 onwards. Interviews will be complemented with footage and still images from experiments and industrial use cases. Videos will be uploaded on a dedicated YouTube channel, referenced on the project public website, and shared via social networks (see section 2.12).

2.4.10. Project Video

A project video will be realised before month 40, counting that by that time the progressive easing of COVID-19 restrictions allows a film crew to travel, to visit individual partner's premises for shooting on site (both in the main research laboratories involved in the project and in the locations of the industrial use cases) and possibly to attend to a physical consortium meeting, for shooting interviews and moments of collective work in the consortium. The video will be about 5 minutes long, and will present the concept, building blocks, use cases and potential impact, with a content structure similar to the one used for the leaflet, adding a summary of the main outcomes and results.

2.4.11. Social network profiles

The MERGING Twitter profile is active at the link : https://twitter.com/MergingProject

The MERGING LinkedIn profile is active at the link : https://www.linkedin.com/company/merging-project

They are both used to communicate quickly upcoming events, the publication of new content on the website, to signal important activities from individual partners (participation to conferences, publications, involvement in other projects that have some overlap with MERGING contents, etc.).

3. Dissemination

3.1. Objectives

The following Objectives for Dissemination were defined in the Project Proposal :

- (O1) to raise awareness and interest of potential users on the project results;
- (O2) to potentiate interaction with stakeholders and potential users to obtain key feedback to enhance exploitation opportunities of the MERGING results;
- (O3) transfer of knowledge among the partners;
- (O4) effective acquisition of new skills by users;
- (O5) to ensure a broad applicability of the project results taking into consideration regulations and standards;
- (O6) to foster MERGING technology acceptance by users.

3.2. Target audiences

The key audiences identified by the MERGING Dissemination plan include:

- Project partners
- Industry (hardware and software integrators, as well as robot manufacturers)
- Scientific Community
- Stakeholders
- Standardization Organisation
- High-level education (HLE)
- European robotics researchers and engineers, in general and in particular those working on Haptics, Robotics and Ergonomics
- Investors in robotics
- Customers

3.3. Tools and actions

In order to disseminate the project's *results*, the MERGING dissemination plan leverages the following principal tools and actions:

- Presentations at Scientific Conferences
- Publications in scientific and technical journals
- Organisation of events during scientific conferences, industrial forum and events promoted by Industrial Associations
- Workshop & Webcast
- Online training
- Participation to Trade Fairs
- Project website & Social Media

The following table presents an updated timeline of how these actions and tools are deployed over the course of the project in order to convey the key messages (section 2.2) to the key audiences (section 2.3).

Action/tool	Target Audience	Key Messages	Timing
Presentations at Scientific Conferences	Industry / Scientific Community	Results, feature and performances of the MERGING solutions	M18 onwards
Publications in scientific and technical journals	Scientific Community	Project results	M18 onwards
Organisation of parallel events during scientific and industry forum, and conferences and events promoted by Industrial Associations	Industry, Scientific Community	Results, feature and performances of the MERGING solutions	M18 onwards
Workshop & Webcast	Industry, scientific community, stakeholders	Results, feature and performances of the MERGING solutions	M42
Online training	Industry, high-level education	Results, feature and performances of the MERGING solutions	M36
Participation to Trade Fairs	Industry	Performance of MERGING solution in targeted applications	M36 onwards
Project website & Social Media	All	Project results (in addition to concept and goals, see "Communication" section	M2 onwards

Within the frame of the Quality Management task of the project (WP1 – Management), an internal review **process** has been formalized for all partners to gain approval from the consortium before submitting journal publications or conference publications:

- 1 month before submission: the publishing partners sends an e-mail to the Consortium in order to inform about the intention of publication, with a brief description of the paper content;
- at least 2 weeks before submission: the publishing partners send an e-mail to the Consortium including the draft with data / photos / figures in order to ensure about non-confidentiality or check about possible opposition of some partners with regard to the CA articles (IP, other…);
- at least 1 week before submission deadline, in case of disagreement, the concerned partner should inform the QCG and the publishing partner.

All publications will follow the Open Access guidelines that are part of H2020. In addition to the publications in journals, Open Research Europe (https://open-research-europe.ec.europa.eu/) will also be considered for publications, in particular for papers at the end of the project describing the 3 use cases.

3.3.1. Presentations at Scientific Conferences

During the first 18 months, one presentation at a scientific conference was carried out :

MERGING partner LMS participated in the 8th Conference on Assembly Technology and Systems (http://cirp-cats2020.com/), held from 29 September to 1 October 2020, by presenting a paper related to planning systems and flexible material modelling :

Title: **On Modelling and Handling of Flexible Materials: A Review on Digital Twins and Planning Systems**

Authors: Dionisis Andronas, George Kokotinis, Sotiris Makris

Abstract:

In this paper, a series of studies dealing with flexible material manipulation in aspects of manipulation, modelling and scheduling are discussed. The main purpose of this work is to provide an overview of the existing technologies and their capabilities both in manufacturing and academia, that can be elaborated in autonomous flexible material handling using robotics. The particularities of flexible material handling require advanced control systems for simulating, monitoring and managing the deformation of plies. A simulation model for predicting and defining the status of manipulated fabrics is proposed. Digital representation of the production system, in the basis of Digital Twin, is intended for achieving real-time adaptation. A pioneer control and planning system, interconnected to the digital model, is proposed for orchestrating the manipulation process. Current limitations of the existing technologies in flexible material handling and modelling are outlined and discussed, towards the implementation of a Workcell controller for flexible material manipulation robotic cell.

and a second one related to the wiring harness twist modelling towards automated robotic assembly operations:

Title: **Twist modelling for assembly of wiring harnesses**

Authors: Alexios Papacharalampopoulos, Sotiris Makris

Abstract:

Wiring harnesses and flexible objects assembly is a major issue for agile manufacturing. However, model-based prediction of shape is a rather complex task, rendering the pre-programming of robots a difficult procedure. The current model, extending previous works on modelling wiring harness mechanical behaviour, deals with twist mechanics. Twist is addressed through adding extra terms to the equations of a previously tested model regarding continuous mechanics. Results on the prediction of the shape are presented and the accuracy of the model is validated using the comparison against experimental data filtered with an image processing algorithm. The integration of the model into a simulation environment is also discussed.

https://www.sciencedirect.com/science/article/pii/S2212827120314244

In March 2021, EPFL submitted a paper proposal for the IROS - IEEE International Conference on Intelligent Robots and Systems 2021 :

Title: **Dexterous textile manipulation using electroadhesive fingers**

Authors: Krishna Manaswi Digumarti, Vito Cacucciolo and Herbert Shea

Abstract :

Handling of fabric is a crucial step in the manufacturing of garments. This task is typically performed by trained workers who manipulate one sheet at a time, thus introducing a bottleneck in the automation of the textile industry. This paper seeks to address the challenge of picking fabric up by proposing a new method of achieving ply-separation. Our approach relies on a finger-tip sized (2 cm2) electroadhesive skin to lift fabric up. A pinch-type grasp is then used to securely hold the separated sheet of fabric, enabling easy manipulation thereafter. The ability to successfully pick up and manipulate a variety of commercial fabrics with diverse materials, shapes, sizes and textures is demonstrated. The ability to handle fabrics 100s of times larger than the electroadhesive skin is unique to our approach. Additionally, we demonstrate the manipulation of non-flat fabrics, a challenge that has not been previously addressed by electroadhesive approaches. We believe

that this method introduces a smarter way of handling flexible and limp materials, showing great potential towards automation of garment manufacturing.

The following participations at future conferences are currently planned. The list will evolve and will be updated depending on the strength of individual results from the various work packages. Participations at conferences will continue for up to four years after the end of the project.

Presentation topic	**Conference title**	**Timing**
Dexterous textile manipulation using electroadhesive fingers	IROS - IEEE International Conference on Intelligent Robots and Systems	September 2021 (cf. proposal above)
Human grasping gestures analysis	IEEE Worldhaptics	July 2021
Analysis of adhesion effect on grasp features and stability with robotic gripper	AIM (IEEE/ASME International Conference on Advanced Intelligent Mechatronics)	July 2022
Sensors fusion for intuitive co-manipulation of large pieces of fabrics	IROS - IEEE International Conference on Intelligent Robots and Systems	2022
Learning based manipulation of large pieces of fabrics	IROS - IEEE International Conference on Intelligent Robots and Systems	2022
Skill-based easy robot programming of industrial handling tasks	IROS - IEEE International Conference on Intelligent Robots and Systems	2022
Smart and versatile solution for automatized fabric handling and manipulation (during composite materials processing)	JEC Conference; SAMPE Europe; ECCM	2022

3.3.2. Publications in scientific and technical journals

The following possible journal submissions are currently foreseen. The list will evolve and will be updated depending on the details of the strength of individual results from the various work packages. Publications will continue for up to four years the end of the project.

Publication topic	**Journal**	**Timing**
Real-time workers tracking and movement decomposition using multi-view images	Advances in Industrial Robotics and Intelligent Systems	2021
Soft electroadhesive grippers for handling textiles	IEEE RA-L/Soft robotics/smart materials and structures	2021
Human grasping gestures analysis: dedicated tools and application examples	IEEE transactions on Haptics	2022
Guidelines for the design of dexterous robotic devices combining human gesture and object centered analysis	Robotics and Autonomous Systems	2022
Theoretical analysis and experimental validation of electro-adhesion effect on grasp stability	IEEE transaction on mechatronics	2022
Smart and versatile solution for automatized fabric handling and manipulation (during composite materials processing)	Journal of Composite Science; Composite Part A / B; JEC Magazine	2022

3.3.3. Organisation of events during scientific conferences, industrial forum and events promoted by Industrial Associations

The following organisation of workshops/parallel events at conferences and industry forums are currently planned. The list will evolve and will be updated depending on the details of the strength of individual results from the various work packages. Organisation of parallel events will continue for up to four years after the end of the project.

Title of workshop	Timing	Conference
Organization of a Workshop on Robotic manipulation of soft materials	2022	IROS
Organization of a common Workshop for APRIL, REMODEL, MERGING and SOFTMANBOT	2023	European Robotics Forum 2023

3.3.4. Workshop & Webcast

A final seminar, the "MERGING Workshop" will be organized (and webcast) at M42 it will gather all stakeholders from several sectors (industry, education, standardization bodies, etc.), present the main results and expected gains of its deployment for the targeted markets and to provide a faster acceptance and integration of the project results in industrial value chain.

3.3.5. Online training

EPFL will be in charge of developing and implementing the Training Plan (D9.4), comprising the elaboration of suitable material for training and technology transfer and organization of the specific training activities during the project (internal seminars -simultaneously to the project meetings), so that the industrial partners can be fully confident about making use of the technology developed within project. Complementarily, a version of the training material excluding confidential information (D9.5), will be made available on-line to ensure training opportunities are widely available for EU workforce.

3.3.6. Participation to Trade Fairs

In the final phase of the project, after M36, the project results will be presented at trade fairs and industry-related events, with a focus on the performance of MERGING solution in targeted applications. A list of potential participations is given in the table below. The list will evolve and will be updated depending on the details of the strength of individual results from the various work packages.

Industry field	Event
Manufacturing	World manufacturing Forum
Manufacturing	Smart Manufacturing Summit
Robotics	LogiMat
Robotics	Global Robot Expo
Robotics	Production & Logistics Forum
Robotics	Hannover Messe
Robotics	Automatica
Robotics	Vision

Industry field	Event
Robotics	Robotics & Motion
Robotics	Sindex
Composite	JEC
Textile & clothing	ITMA
Textile & clothing	Texworld
Textile & clothing	Interfilier
Textile & clothing	Lingerie Pro
Transport	Busworld
Packaging	All4pack
Packaging	FachPack
Packaging	Interpack
Packaging	Packinnove Machine

3.3.7. Project website & Social Media

The website and social media profiles described in section 2.5 and 2.12 will also be used to re-post and highlight journal and conference publications and all disseminated results. The website, in particular, will ensure a single point of entry to locate all public results arising from the project, linking to individual journals, conference website, public repositories, and will continue to do so for up to 4 years after the project end.

4. Clustering and collaboration with other projects

On the occasion of the preparatory meetings of the workshop at the European Robotics Forum 2021 (see section 2.4.3.1.), a fruitful collaboration with the H2020 projects APRIL, REMODEL and SOFTMANBOT has started. Further joint workshops are foreseen, as well as stand-alone online events organized in collaboration by two or more projects, joint news releases and mutual relaunching (on social media, newsletters and websites) of each project's results. MERGING's initiative in organizing the common workshop was key in promoting this collaboration, and further clustering activities will be discussed and planned soon with the other projects. They will be described in more detail in this same section in the future revisions of this deliverable.

5. Assessment / evaluation criteria

The success of each action proposed in this plan will be measured by tracking over time, starting after the official launch of the website, the monthly evolution of the following indicators:

Indicator	Target (M42)	Result (M18)
Traffic on the website	>10,000 pageviews	2,580 pageviews
Number of followers on social networks	>200 followers	60

Indicator	**Target (M42)**	**Result (M18)**
Number of project mentions on general media (TV, magazines, daily newspapers, online-only media portals...) and type (mentions, dedicated articles, interviews to Project members...);	>2 dedicated articles on media with international reach >20 mentions >5 interviews	10 mentions in national-level media
Number of papers accepted by scientific journals	>7 articles	
Number of accepted papers/presentations at conferences and similar events	>7 papers >20 presentations	2
Number of participants to online training	>100	
Number of attendees to final MERGING workshop/webcast	>100	
Number of parallel project events organised	>3 events	1
Number of attendances to trade fairs	>7 participations	
Number of stories/events organized with European platforms for women in science/stem	>2	

ANNNEX A – Project leaflet