European Commission

Fostering knowledge valorisation through the arts and cultural institutions

Research and Innovation

Fostering knowledge valorisation through the arts and cultural institutions

European Commission
Directorate-General for Research and Innovation
Directorate E – Prosperity
Unit E.2. Knowledge Valorisation Policies and IPR
Email RTD-VALORISATION-POLICIES-IPR@ec.europa.eu
RTD-PUBLICATIONS@ec.europa.eu
Contact Iphigenia POTTAKI, policy officer, unit E.2.
Iphigenia.pottaki@ec.europa.eu

European Commission
B-1049 Brussels

Manuscript completed in September 2022

PDF ISBN 978-92-76-53777-9 doi: 10.2777/377987 KI-09-22-309-EN-N

Luxembourg: Publications Office of the European Union, 2022

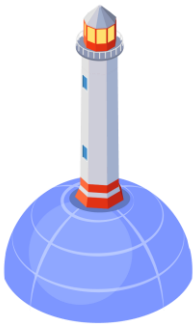
EUROPEAN COMMISSION

Fostering knowledge valorisation through the arts and cultural institutions

2022

Directorate-General for Research and Innovation
Prosperity Directorate

TABLE OF CONTENTS



FOREWORD

A creative and transdisciplinary movement across Europe is in the making with the New European Bauhaus initiative, building bridges between the world of science and technology with the world of art and culture. Through co-creation with artists, researchers, designers, architects, educators, and people, we are addressing societal and environmental challenges and making cities more sustainable, beautiful, and inclusive.

As Commissioner with a portfolio that includes Research and Innovation, Culture, Education, and Youth, I have always believed that the arts and cultural institutions can help bring science closer to our people while creating value to our economy and society. Yet, there has been no such study as this one linking the arts with knowledge valorisation through many case studies, best practices, projects supported by European programmes and national and local initiatives, as well as insights from artists and cultural organisations across the EU.

Europe's arts and cultural organisations can significantly contribute to valorising the knowledge coming from research and innovation. Fostering knowledge valorisation with the arts can happen during all phases of the knowledge chain. Artists and cultural organisations dispose of a unique set of competencies – artistic skills, art thinking methods, artworks – with a clear potential to increase the valorisation of knowledge coming from research. This study finds compelling evidence that arts and cultural organisations play a distinct role in knowledge ecosystems, making them valuable partners in achieving the European Research Area. At the same time, the study also points to barriers at the individual, organisational and ecosystem levels that prevent effective participation of the arts in knowledge processes and impactful knowledge valorisation. The report clearly reconfirms the need for policies that support systemic change and transformation.

We are on the right path. On 9 August 2022, the European Commission adopted a proposal for a Council Recommendation on the Guiding Principles for Knowledge Valorisation to align policy principles and measures for national, regional and local policymakers for more knowledge valorisation. I am pleased to see that the findings of this study are reflected in our proposal. One of the Guiding Principles expressly states the importance of encouraging and facilitating multidisciplinary co-creation, which extends beyond technological areas.

Still, much more can be done to strengthen the role of the arts in knowledge valorisation. This study provides some concrete and actionable recommendations, which we can take forward,

using our funding programmes, overcoming silos and developing concrete initiatives to address the barriers and prepare the ground for the systemic changes required. As a first step, I intend to use the lessons from this study in ensuring that we put in place appropriate conditions for more knowledge valorisation – with a more decisive role for the arts and cultural institutions.

Commissioner Mariya Gabriel

European Commissioner for Innovation, Research, Culture, Education and Youth

EXECUTIVE SUMMARY

In recent years the European Commission has taken several initiatives to increase the impact of research and innovation (R&I) in European society. The Pact for Research and Innovation in Europe, endorsed by the Council in November 2021, identifies value creation and knowledge valorisation as one of the priority areas for joint action in the European Research Area (ERA). On 9 August 2022 the European Commission adopted a proposal for a Council Recommendation on the Guiding Principles for Knowledge Valorisation for a common line on policy principles and measures for national, regional and local policymakers to improve knowledge valorisation. In this context, much attention is paid to a more diverse societal engagement in R&I, involving a multitude of actors such as academia, industry, citizens, public administrations and policy makers.

This study, prepared by IDEA consult, specifically investigates **the role(s) that arts and cultural organisations can play in fostering the valorisation of knowledge coming from research**, and how European policy can strengthen their contribution.

Based on a literature review, diverse stakeholder interviews, case study analysis and focus group discussions, the study provides insights on:

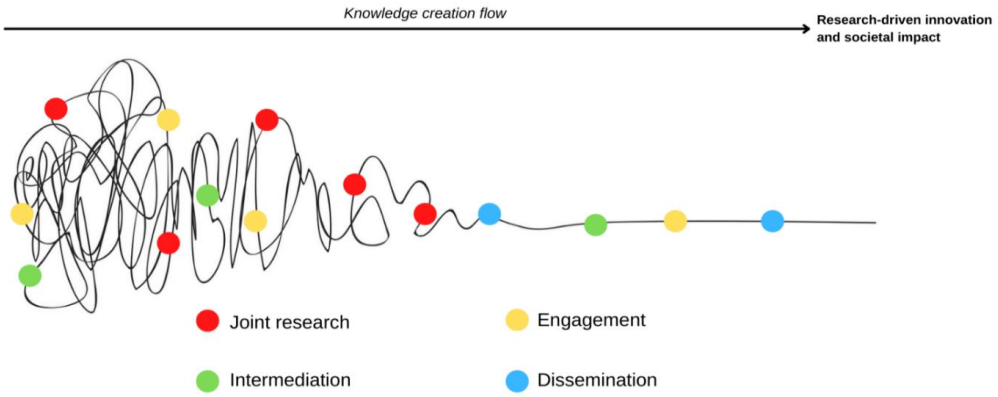
- the drivers and formats of engaging arts and cultural organisations in knowledge processes
- the unique value(s) and competencies that they bring in
- the enabling conditions supporting their participation.

The study also highlights the main barriers that currently limit the arts and cultural organisations from realising their full potential contribution in fostering knowledge valorisation. Based on the findings, the study provides a set of policy recommendations for the European Commission to further improve the conditions in Europe to tap into the potential of the arts and cultural organisations thus increasing the impact of knowledge valorisation coming from research.

Fostering knowledge valorisation is an integral part of knowledge processes

Knowledge valorisation is a process where knowledge is effectively absorbed by specific target groups, users and society. Fostering the valorisation of knowledge coming from research can take place during all phases of the knowledge chain – from formulating the right research questions to communicating about and applying new research results or innovations. As such, the knowledge valorisation process is not a linear process in which valorisation only starts at the end of the chain. It rather occurs through the interaction of multiple actors along the entire knowledge flow. The **arts and cultural organisations are one of the possible actors to collaborate with in the knowledge chain to come to impactful valorisation of knowledge coming from research**.

Figure: Participation of arts and cultural organisations along the knowledge creation flow



Source: IDEA Consult (built on the Design Squiggle illustration)

Based on the research, we distinguish four different collaboration settings in which the arts and cultural organisations contribute to knowledge valorisation:

- **Joint research**: arts actors can feed research during the scoping phase. As they instil new thinking and research questions and connect researchers and society with future scenarios and complex societal issues (so-called 'speculative thinking'), they contribute to the formulation of more relevant research questions for society.
- **Intermediation**: arts actors also take up the role of facilitating the connection between various stakeholder groups in the knowledge processes. They act as connectors between research (academia and research organisations), industry and/or society (citizens and communities). This connecting role may be limited to a specific project or sometimes result in more structured (long-term) partnerships.
- **Engagement**: arts actors also offer spaces for experimentation and citizens engagement. Hybrid spaces, such as citizens labs, creative hubs and maker spaces, among others, are places where citizens can not only familiarise themselves with research results and their benefits for society in a participatory way, but also co-create new research-based visions and solutions to specific issues.
- **Dissemination**: the arts and cultural organisations are also involved in the dissemination of research results. Thanks to their ability to communicate in an unconventional way, they can translate complex content into comprehensible language and as such critically convey research results to society and its sub-target groups (young people, adults, students, elderly people, etc.), as well as give voice to reflections, doubts or other emotions in society that come with new knowledge and innovations.

The main channel through which arts-based processes of knowledge creation and valorisation occur is through **collaboration with multiple actors in the knowledge**

ecosystem (research institutes, industry, policy makers, civil society). These multidisciplinary collaborations with the arts take place either **in open-ended and non-linear knowledge processes or in project-based settings**. In both cases intermediaries play an important role in connecting the actors and facilitating the collaboration. These intermediaries can be either individuals (such as independent researchers, artists or cultural freelancers) or cultural and hybrid organisations (such as creative hubs, living labs, citizen labs) with a focus on network facilitation.

Arts and cultural organisations have a unique set of competencies to strengthen the valorisation of knowledge

What makes the contribution of arts and cultural professionals unique is their very specific set of skills, competences and talents that they bring to knowledge creation and valorisation processes:

- Artists and cultural professionals have very specific skills, notably among them storytelling. They can **present a narrative** in many ways, by using a series of images representing moments in a story, or by selecting a central moment to represent the whole story. Artists also invent their own stories, leaving their audience to imagine the narrative. Most importantly, artists and cultural professionals can stimulate the development of creative skills in others, thus impacting the absorption of knowledge.
- The arts also have the ability to alter the way in which we experience the world thanks to **art thinking**, i.e., the process of applying artistic thinking and an artful view to a broader range of challenges, related to a variety of topics (humanity, technology, ecology, health, etc.).
- These artistic skills can further result in the development of **arts-based methods and artworks**. Together, they tend to develop what is called 'new ways of sensing', as they create conditions for strengthening relationships with the world through signs, forms, actions and objects.

This unique set of competencies can be found both in the person of artists and creatives who work individually and within cultural and creative organisations and organisations of various nature. Moreover, the latter also act as an important exchange platform where it is possible to implement open-ended processes of creation and valorisation.

Arts and cultural organisations are not yet fully considered part of knowledge ecosystems

Despite the unique value that arts and cultural organisations can bring in knowledge (valorisation) processes, such multi-actor collaborations with the arts are still far from being mainstream in current R&I practices. **Barriers at the level of both the individual actors, the knowledge ecosystem and the overall R&I system** (policies, funding, governance)

currently limit artists and cultural organisations from fully participating in knowledge creation and valorisation processes.

At the level of the overall R&I system the main challenges relate to policy silo thinking that is hindering the establishment of transdisciplinary collaborations with the arts. This further translates into a lack of adequate (long-term) funding supporting such collaborations beyond one-off project funding. Finally, it remains very challenging to design effective policies to support the creation of local and (inter)regional knowledge ecosystems that successfully connect and involve all knowledge partners, including the arts.

The second category of obstacles refers to the system of relationships between actors within the knowledge ecosystem. The main challenge is represented by the fact that different 'languages' are spoken at ecosystem level - academic and independent researchers, industrial stakeholders, artistic actors and citizens tend not to understand the others' way of doing, thinking and speaking – while (a lack of) current structures (evaluation structures in universities, lack of connecting platforms, etc.) prevent the actors from overcoming their silos.

Finally at the level of the single actors within knowledge ecosystems, we observe that on the side of research institutes and industry, knowledge valorisation strategies are still very much focused on economic outputs rather than on knowledge (valorisation) activities to increase the societal impact of their work. Moreover, researchers are often not trained to work collaboratively with other partners for knowledge valorisation purposes. On the side of arts and cultural organisations we find a reluctance towards the involvement of the arts in knowledge valorisation processes. Especially a fear of being instrumentalised often prevents transdisciplinary collaborations.

The analysis of obstacles hindering collaboration at macro- and micro-ecosystem level, along with the overall investigation, leads to the identification of a number of **enabling conditions that appear critical for arts and cultural organisations to strengthen their role in knowledge ecosystems in Europe**. They can be clustered into four pillars:

1. Awareness & recognition
2. Networking & interaction
3. Valorisation frameworks & support
4. Skills & capacity building.

Multiple actors have a role to play in creating these enabling conditions, such as universities and research institutes, educational institutes, industrial platforms and cluster organisations or representative networks of artists and cultural organisations. In this study we specifically focus on the role of European policy makers. How can they mobilise relevant policy

instruments to orchestrate the multitude of actors and initiatives, and establish a supportive environment for collaborations with arts and cultural organisations for more impactful knowledge valorisation?

> *Reinforcing the role of arts and cultural organisations in knowledge ecosystems requires policies that support systemic change*

To be able to fully tap into the potential of arts and cultural organisations in knowledge valorisation for the benefit of society in Europe, we advise the European Commission to specifically activate a policy toolkit that is oriented towards a systemic change, where current dominant practices with respect to knowledge valorisation are complemented with new concepts and frameworks that much better recognise the distinctive role(s) that arts and cultural organisations play in knowledge ecosystems.

Such policy toolkit for systemic change should focus on the following five elements:

1. Further increase pressure for change

The fact that arts and cultural organisations can positively contribute to fostering knowledge valorisation and impact-oriented innovations is not yet fully reflected in strategic EU policy documents, let alone at national or regional level. Although this study is a clear indication of changing mindsets at the European level about the multidimensional potential of arts and cultural organisations in knowledge (valorisation) processes, this is not yet translated in key European documents that relate to both knowledge valorisation and knowledge ecosystems.

Based on this research, the study recommends that the European Commission further stimulates **awareness creation at the various levels of policy making** of the importance of user-driven and co-creative approaches for knowledge creation and of the relevance of involving the arts. One way to do this, is by leading by example and **committing to a holistic and long-term European policy vision and strategy** that promotes the integration of the arts in research and innovation policies and instruments.

2. Create new conditions and networks

The uptake of arts and cultural organisations in knowledge (valorisation) processes benefits from the existence of transdisciplinary networking opportunities. However, this study finds that only few policy instruments encourage and support multi-actor collaborations and networking with arts and cultural organisations.

Therefore, it is recommended that the European Commission facilitates a more **structured exchange** between policy makers in the areas of R&I and knowledge valorisation on the one hand and EU networks promoting collaborations with the arts on the other hand. Moreover,

the European Commission can actively **support the establishment of platforms** for transdisciplinary consultation and exchange, both at the EU level and Member State level.

Furthermore, the study highlights the importance of **removing barriers in existing policy instruments for transdisciplinary networking and collaboration with the arts**. It is recommended to involve sectoral professionals and experts with a transdisciplinary mindset, citizens and societal actors in designing funding programmes and calls (co-design of calls).

3. Continue mobilising resources for experimentation

Existing policy instruments supporting the engagement of arts and cultural organisations in knowledge (valorisation) processes primarily focus on providing financial support for experimentation. Such funding for experimentation is still very important to create the necessary space for stakeholders to engage in this high-risk activity (in terms of unfamiliar working environment, uncertain outcomes, etc.), test and evaluate it, and draw lessons from this.

However, an important drawback of these funding programmes is the lack of financial support to cover costs for exploring and building collaborative partnerships, mediation (by skilled mediators) and learning between partners, as well as for structured reporting of the impact generated through the collaboration, the barriers that have been encountered or lessons learnt. The lack of funding for these activities perpetuates the fragmentation of results and lessons learnt, and hinders the development of an evidence base on which more effective policy support frameworks can be designed to upscale these types of practices.

Based on these findings, it is recommended that the **range of funding instruments** to support collaborations with arts and cultural organisations in knowledge valorisation processes is **widened, to cover all scientific disciplines** (hard and soft sciences) **and types of innovations** (technological, social, etc.), while fitting the needs and structures of the different types of actors (academia, large corporations, SMEs and microstructures, freelancers) and multi-actor collaborations. Furthermore, the study highlights to not only focus on funding project-based experimentation, but also to provide **funding for physical exchange platforms** that are especially important to enhance open-ended collaborations.

Finally, the study advises to incentivise all stakeholders involved in knowledge valorisation processes with arts and cultural organisations, to **accelerate (impact) reporting and the development of an evidence base** on the role(s) that arts and cultural organisations play in these processes**.**

4. Facilitate the mainstreaming of positive system changes

To accelerate the mainstreaming of arts-based collaborations in knowledge valorisation processes, the study highlights that it is critical to inspire current non-users and take away

their doubts and questions. Relevant instruments to do this could be e.g., exchanges with current users, testimonies of users, verifiable evidence of the benefits, innovation contests or repositories with inspiring cases. At the same time, this study finds that also early adopters would benefit from being better connected, to share experiences and lessons learnt, to further expand the body of knowledge and expertise on this topic in Europe and overcome fragmentation of initiatives.

Based on these findings, the study recommends that the European Commission **further develops the existing EU Knowledge Valorisation Platform** and its repository of practices in such a way that it also allows to specifically put the spotlights on the role(s) that arts and cultural organisations can play in knowledge valorisation processes.

Finally, it is recommended to **further mobilise resources for capacity building and competence development** for all partners involved in knowledge (valorisation) processes, including those from arts and cultural organisations.

5. Establish direction and monitor

With this study, the European Commission has signalled a clear interest to investigate the potential of involving arts and cultural organisations in fostering knowledge valorisation. When the European Commission decides to implement European policy initiatives to further strengthen the uptake of such practices in Europe, a next step would be to translate this decision into a plan of action. Such plan of action would come with a monitoring and evaluation cycle, to ensure that progress is made with respect to the systemic change needed to fully tap into the potential of arts and cultural organisations in knowledge valorisation processes.

Possible actions as follow-up to this study may include a workplan to:

- **a)** define short-term, medium-term and longer-term objectives of the European Commission with respect to fostering knowledge valorisation through the arts, and
- **b)** define actions, key responsibilities and necessary resources to meet these objectives.

It is suggested to **foresee an in-depth evaluation** after e.g., four-five years to take stock of the policy actions taken and reflect upon the impact they have had on the position of the arts and cultural organisations in knowledge ecosystems and their role in knowledge valorisation in Europe.

RÉSUMÉ ANALYTIQUE

Ces dernières années, la Commission européenne a pris plusieurs initiatives pour accroître l'impact de la recherche et de l'innovation (R&I) dans la société européenne. Le Pacte pour la recherche et l'innovation en Europe approuvé par le Conseil en novembre 2021, identifie la création de valeur et la valorisation des connaissances comme l'un des domaines prioritaires pour une action conjointe dans l'Espace européen de la recherche (EER). Le 9 août 2022, la Commission européenne a adopté une proposition de recommandation du Conseil sur les principes directeurs pour la valorisation des connaissances établissant une ligne commune sur les principes et les mesures stratégiques à l'intention des décideurs politiques nationaux, régionaux et locaux visant à améliorer la valorisation des connaissances. Dans ce contexte, une grande attention est accordée à un engagement sociétal plus diversifié dans la R&I, impliquant une multitude d'acteurs tels que le monde universitaire, l'industrie, les citoyens, les administrations publiques et les décideurs politiques.

Cette étude, préparé par IDEA Consult, examine spécifiquement le(s) rôle(s) que les organisations artistiques et culturelles peuvent jouer pour favoriser la valorisation des connaissances issues de la recherche, et comment la politique européenne peut renforcer leur contribution.

Sur base d'une revue de la littérature scientifique, d'entretiens avec diverses parties prenantes, d'une analyse d'études de cas et de discussions de groupe, l'étude fournit un aperçu :

- les moteurs et les formats d'engagement des organisations artistiques et culturelles dans les processus de connaissance
- la ou les valeurs et compétences uniques qu'ils apportent
- les conditions favorables à leur participation.

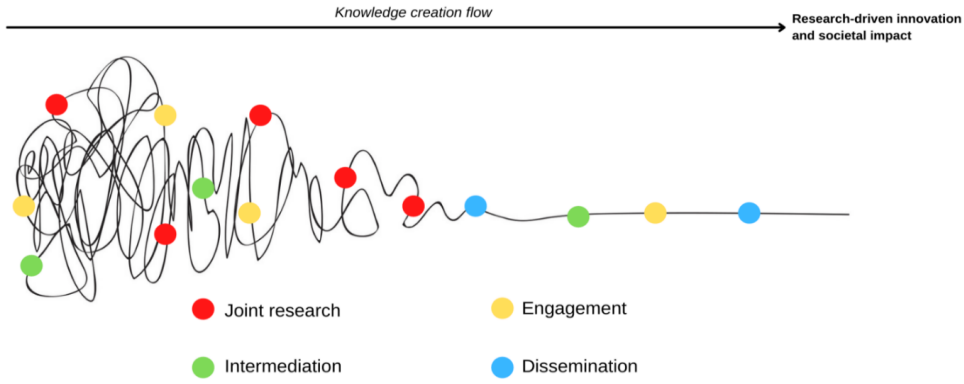
L'étude met également en évidence les principaux obstacles qui empêchent actuellement les organisations artistiques et culturelles de réaliser pleinement leur contribution potentielle à la valorisation des connaissances. Sur la base de ces résultats, l'étude fournit une série de recommandations politiques pour la Commission européenne afin d'améliorer les conditions en Europe pour exploiter le potentiel des organisations artistiques et culturelles et ainsi augmenter l'impact de la valorisation des connaissances issues de la recherche.

Favoriser la valorisation des connaissances fait partie intégrante des processus de connaissance-

La valorisation de la connaissance est un processus par lequel la connaissance est effectivement absorbée par des groupes cibles spécifiques, des utilisateurs et la société en général. La promotion de la valorisation des connaissances issues de la recherche peut intervenir à toutes les étapes de la chaîne de la connaissance, de la formulation des bonnes questions de recherche à la communication des nouveaux résultats de recherche ou des

innovations. En tant que tel, le processus de valorisation de connaissance n'est pas un processus linéaire dans lequel la valorisation ne commence qu'au bout de la chaîne. Elle se produit plutôt par l'interaction de multiples acteurs tout au long du flux de connaissances. **Les organisations artistiques et culturelles sont l'un des acteurs possibles avec lesquels collaborer dans la chaîne de la connaissance pour parvenir à une valorisation efficace des connaissances issues de la recherche.**

Figure : Participation des organisations artistiques et culturelles le long du flux de création de connaissances



Source: IDEA Consult (basé sur l'illustration Design Squiggle)

Sur la base de cette recherche, nous distinguons quatre contextes de collaboration différents dans lesquels les organisations artistiques et culturelles contribuent à la valorisation des connaissances :

- **Recherche conjointe** : les acteurs artistiques peuvent enrichir la recherche dès la phase de cadrage. En suscitant de nouvelles réflexions et questions de recherche et en mettant en relation les chercheurs et la société avec des scénarios futurs et des problèmes sociétaux complexes (ce que l'on appelle la "pensée spéculative"), ils contribuent à la formulation de questions de recherche plus pertinentes pour la société.
- **Intermédiation** : les acteurs artistiques ont également pour rôle de faciliter la connexion entre les différents groupes de parties prenantes dans les processus de connaissance. Ils agissent comme des connecteurs entre la recherche (universités et organismes de recherche), l'industrie et/ou la société (citoyens et communautés). Ce rôle de connexion peut être limité à un projet spécifique ou parfois déboucher sur des partenariats plus structurés (à long terme).
- **Engagement** : les acteurs artistiques offrent également des espaces d'expérimentation et d'engagement citoyen. Les espaces hybrides, tels que les laboratoires citoyens, les hubs créatifs et les maker espaces, entre autres, sont des lieux où les citoyens peuvent non seulement se familiariser avec les résultats de la recherche et leurs avantages pour la société de manière participative, mais aussi cocréer de nouvelles visions fondées sur la recherche et des solutions à des problèmes spécifiques.

- **Diffusion** : Finalement, les arts et les organisations culturelles sont également impliqués dans la diffusion des résultats de la recherche. Grâce à leur capacité à communiquer de manière non conventionnelle, ils peuvent convertir des contenus complexes en un langage compréhensible et, de ce fait, transmettre les résultats de la recherche à la société et à ses sous-groupes cibles (jeunes, adultes, étudiants, personnes âgées, etc.), ainsi que donner une voix aux réflexions, doutes ou autres émotions de la société qui accompagnent les nouvelles connaissances et innovations.

Le principal canal par lequel les processus de création et de valorisation de la connaissance basés sur les arts se produisent est **la collaboration avec de multiples acteurs de l'écosystème de la connaissance** (instituts de recherche, industrie, décideurs politiques, société civile). Ces collaborations multidisciplinaires avec les arts se déroulent soit **dans le cadre de processus de connaissance ouverts et non linéaires, soit dans le cadre de projets**. Dans les deux types de collaboration, les intermédiaires jouent un rôle important en mettant en relation les acteurs et en facilitant la collaboration. Ces intermédiaires peuvent être soit des individus (tels que des chercheurs indépendants, des artistes ou des indépendants culturels), soit des organisations culturelles et des organisations hybrides (telles que des hubs créatifs, des living labs, des citizen labs), l'accent étant mis sur la facilitation des réseaux.

Les organisations artistiques et culturelles disposent d'un ensemble unique de compétences pour renforcer la valorisation de la connaissance

Ce qui rend la contribution des professionnels des arts et de la culture unique, c'est l'ensemble très spécifique d'aptitudes, de compétences et de talents qu'ils apportent aux processus de création et de valorisation des connaissances :

- Les artistes et les professionnels de la culture ont des compétences très spécifiques en matière de narration. Ils peuvent **présenter un récit de plusieurs façons**, en utilisant une série d'images représentant des moments de l'histoire, ou en sélectionnant un moment central pour représenter l'ensemble de l'histoire. Les artistes inventent également leurs propres histoires, laissant leur public imaginer le récit. Plus important encore, les artistes et les professionnels de la culture peuvent stimuler le développement de compétences créatives chez les autres, ce qui a un impact sur l'absorption des connaissances.
- Les arts ont également la capacité de modifier la façon dont nous percevons le monde grâce à **la pensée artistique**, c'est-à-dire le processus d'application de la pensée artistique et d'une vision artistique à un plus large éventail de défis, liés à une variété de sujets (humanité, technologie, écologie, santé, etc.)
- Ces compétences artistiques peuvent ensuite déboucher sur le développement de **méthodes et d'œuvres artistiques**. Ensemble, elles tendent à développer ce que l'on appelle de "nouvelles façons de sentir", car elles créent des conditions permettant de

renforcer les relations avec le monde par le biais de signes, de formes, d'actions et d'objets.

Cet ensemble unique de compétences se retrouve à la fois dans la personne des artistes et des créatifs qui travaillent individuellement et au sein d'organisations culturelles et créatives de nature diverse. En outre, ces dernières font également office de plate-forme d'échange importante où il est possible de mettre en œuvre des processus ouverts de création et de valorisation.

Les organisations artistiques et culturelles ne sont pas encore pleinement considérées comme faisant partie des écosystèmes de la connaissance

Malgré la valeur unique que les organisations artistiques et culturelles peuvent apporter aux processus de connaissance (valorisation), ces collaborations interdisciplinaires avec les arts sont encore loin d'être intégrées dans les pratiques actuelles de R&I. **Des obstacles au niveau des acteurs individuels, de l'écosystème de la connaissance et du système global de R&I** (politiques, financement, gouvernance) empêchent actuellement les artistes et les organisations culturelles de participer pleinement aux processus de création et de valorisation des connaissances :

- Au niveau du système global de R&I, les principaux défis sont liés au cloisonnement des politiques, qui empêche l'établissement de collaborations interdisciplinaires avec les arts. Cela se traduit également par un manque de financement adéquat (à long terme) pour soutenir ces collaborations au-delà du financement de projets ponctuels. Enfin, il reste très difficile de concevoir des politiques efficaces pour soutenir la création d'écosystèmes de connaissances interdisciplinaires locaux et (inter)régionaux qui connectent et impliquent avec succès tous les partenaires de la connaissance, y compris les arts.
- La deuxième catégorie d'obstacles concerne le système de relations entre les acteurs de l'écosystème de la connaissance. Le principal défi est représenté par le fait que différents "langages" sont parlés au niveau de l'écosystème - les chercheurs universitaires et indépendants, les acteurs industriels, les acteurs artistiques et les citoyens ont tendance à ne pas comprendre la façon de faire, de penser et de parler des autres - tandis que le (manque de) structures actuelles (structures d'évaluation dans les universités, manque de plateformes de connexion,...) empêche les acteurs de surmonter leurs silos.
- Enfin, au niveau des acteurs individuels au sein des écosystèmes de la connaissance, nous observons que du côté des instituts de recherche et de l'industrie, les stratégies de valorisation de la connaissance sont encore très axées sur les résultats économiques plutôt que sur les activités de valorisation de la connaissance visant à accroître l'impact sociétal de leur travail. En outre, les chercheurs ne sont souvent pas formés pour travailler en collaboration avec d'autres partenaires à des fins de valorisation des connaissances. Mais du côté des organisations artistiques et

culturelles, nous constatons également une réticence à l'égard de l'implication des arts dans les processus de valorisation des connaissances. En particulier, la crainte d'être instrumentalisé empêche souvent les collaborations interdisciplinaires.

L'analyse des obstacles à la collaboration au niveau des macro- et micro-écosystèmes, ainsi que l'enquête globale, conduisent à l'identification d'un **certain nombre de conditions favorables qui semblent essentielles pour que les organisations artistiques et culturelles renforcent leur rôle dans les écosystèmes de la connaissance en Europe.** Elles peuvent être regroupées en quatre piliers : 1/ Sensibilisation et reconnaissance ; 2/Réseautage et interaction, 3/ Cadres de valorisation et soutien et 4/ Compétences et renforcement des capacités.

De multiples acteurs ont un rôle à jouer dans la création de ces conditions favorables, comme les universités et les instituts de recherche, les instituts d'enseignement, les plateformes industrielles et les organisations de clusters ou les réseaux représentatifs d'artistes et d'organisations culturelles. Dans cette étude, nous nous concentrons spécifiquement sur le rôle des décideurs politiques européens. Comment peuvent-ils mobiliser les instruments politiques pertinents pour orchestrer la multitude d'acteurs et d'initiatives, et établir un environnement favorable aux collaborations avec les organisations artistiques et culturelles pour une valorisation plus efficace des connaissances ?

Renforcer le rôle des organisations artistiques et culturelles dans les écosystèmes de la connaissance nécessite des politiques qui soutiennent le changement systémique.

Afin d'être en mesure d'exploiter pleinement le potentiel des organisations artistiques et culturelles dans la valorisation de la connaissance au profit de la société en Europe, nous conseillons à la Commission européenne d'activer spécifiquement un ensemble d'outils politiques orientés vers le changement systémique où les pratiques dominantes actuelles en matière de valorisation de la connaissance sont complétées par de nouveaux concepts et cadres qui reconnaissent beaucoup mieux le(s) rôle(s) distinctif(s) que les organisations artistiques et culturelles jouent dans les écosystèmes de la connaissance.

Cette boîte à outils politique pour un changement systémique devrait se concentrer sur les cinq éléments suivants :

1. Accroître encore la pression pour le changement

Le fait que les organisations artistiques et culturelles puissent contribuer positivement à la valorisation des connaissances et aux innovations axées sur l'impact n'est pas encore pleinement reflété dans les documents stratégiques de l'UE, et encore moins au niveau national ou régional. Bien que cette étude soit une indication claire de l'évolution des mentalités au niveau européen concernant le potentiel multidimensionnel des organisations artistiques et culturelles dans les processus de valorisation de la connaissance, cela ne se traduit pas encore dans les documents clés européens qui concernent à la fois la valorisation de la connaissance et les écosystèmes de la connaissance.

Sur la base de cette recherche, l'étude recommande que la Commission européenne **stimule davantage la prise de conscience, aux différents niveaux de l'élaboration des politiques**, de l'importance des approches orientées vers l'utilisateur et co-créatives de la création de connaissances et de la pertinence de l'implication des arts. Une façon d'y parvenir est de montrer l'exemple et de **s'engager dans une vision et une stratégie politique européenne holistique et à long terme** qui promeut l'intégration des arts dans les politiques et instruments de recherche et d'innovation.

2. Créer de nouvelles conditions et de nouveaux réseaux

La participation des organisations artistiques et culturelles aux processus de connaissance (valorisation) bénéficie de l'existence de possibilités de mise en réseau transdisciplinaires. Cependant, cette étude constate que seuls quelques instruments politiques encouragent et soutiennent les collaborations transdisciplinaires et la mise en réseau avec les organisations artistiques et culturelles.

Il est donc recommandé que la Commission européenne facilite elle-même **un échange plus structuré** entre les décideurs politiques dans les domaines de la R&I et de la valorisation des connaissances, d'une part, et les réseaux européens qui encouragent les collaborations avec les arts, d'autre part. En outre, la Commission européenne peut **soutenir activement la mise en place de plateformes** de consultation et d'échange transdisciplinaires, tant au niveau de l'UE que des États membres.

En outre, l'étude souligne l'importance d'éliminer les obstacles dans les instruments politiques existants pour la mise en réseau transdisciplinaire et la collaboration avec les arts. Nous recommandons d'impliquer les professionnels et les experts sectoriels ayant un esprit interdisciplinaire, les citoyens et les acteurs sociétaux dans la conception des programmes et des appels de financement (co-conception des appels).

3. Continuer à mobiliser des ressources pour l'expérimentation

Les instruments politiques existants qui soutiennent l'engagement des organisations artistiques et culturelles dans les processus de connaissance (valorisation) se concentrent principalement sur le soutien financier à l'expérimentation. Ce financement de l'expérimentation reste très important pour créer l'espace nécessaire aux parties prenantes pour s'engager dans cette activité à haut risque (en termes d'environnement de travail peu familier, de résultats incertains,...), la tester et l'évaluer, et en tirer des leçons.

Cependant, un inconvénient important de ces programmes de financement est le manque de soutien financier **destiné à** couvrir les coûts liés à l'exploration et à la mise en place de partenariats de collaboration, à la médiation (par des médiateurs qualifiés) et à l'apprentissage entre les partenaires. Il en va de même **pour le manque de soutien financier dédié au rapport structuré de l'incidence générée par la collaboration, des obstacles rencontrés ou des leçons apprises**. Le manque de financement de ces activités perpétue la fragmentation des résultats et des leçons apprises, et entrave le développement

d'une base de preuves sur laquelle des cadres de soutien politique plus efficaces peuvent être conçus pour étendre ce type de pratiques.

Sur la base de ces résultats, il est recommandé d'élargir la gamme des instruments de financement destinés à soutenir les collaborations avec les organisations artistiques et culturelles dans les processus de valorisation des connaissances, afin de couvrir toutes **les disciplines scientifiques** (sciences dures et molles) et tous **les types d'innovations** (technologiques, sociales, ...), tout en s'adaptant aux besoins et aux structures des différents types d'acteurs (universités, grandes entreprises, PME et microstructures, indépendants) et aux collaborations transdisciplinaires. En outre, l'étude souligne qu'il ne faut pas seulement se concentrer sur le financement de l'expérimentation par projet, mais aussi sur **le financement des plateformes d'échange physique** qui sont particulièrement importantes pour renforcer les collaborations ouvertes.

Enfin, l'étude conseille d'encourager toutes les parties prenantes impliquées dans les processus de valorisation des connaissances avec les organisations artistiques et culturelles, afin **d'accélérer les rapports (d'impact) et le développement d'une base de données probantes** sur le(s) rôle(s) que les organisations artistiques et culturelles jouent dans ces processus.

4. Faciliter l'intégration des changements positifs du système

Pour accélérer l'intégration des collaborations artistiques dans les processus de valorisation des connaissances, l'étude met en évidence qu'il est essentiel d'inspirer les non-utilisateurs actuels et de lever leurs doutes et leurs questions. Les instruments pertinents pourraient être, par exemple, des échanges avec les utilisateurs actuels, des témoignages d'utilisateurs, des preuves vérifiables des avantages, des concours d'innovation ou des référentiels de cas inspirants. Dans le même temps, cette étude montre que les premiers adoptants bénéficieraient également d'une meilleure connexion, afin de partager les expériences et les leçons apprises, d'élargir le corpus de connaissances et d'expertise sur ce sujet en Europe et de surmonter la fragmentation des initiatives.

Sur la base de ces résultats, l'étude recommande à la Commission européenne de **développer davantage la Plateforme de valorisation des connaissances de l'UE** existante et son référentiel de pratiques de manière à ce qu'elle permette également de mettre spécifiquement l'accent sur le(s) rôle(s) que les organisations artistiques et culturelles (peuvent) jouer dans les processus de valorisation des connaissances.

L'étude suggère également d'intégrer les résultats de l'étude dans les futurs principes directeurs pour la valorisation des connaissances et le code de pratique, et d'encourager la création de preuves de l'impact de la co-création artistique dans les processus de valorisation.

Enfin, il est recommandé de **mobiliser davantage les ressources pour le renforcement des capacités et le développement des compétences** de tous les partenaires impliqués

dans les processus de valorisation des connaissances, y compris les organisations artistiques et culturelles.

5. Définir une orientation et assurer un suivi

Avec cette étude, la Commission européenne a clairement indiqué son intérêt à étudier le potentiel de l'implication des organisations artistiques et culturelles dans la promotion de la valorisation des connaissances. Lorsque la Commission européenne décide de mettre en œuvre des initiatives politiques européennes pour renforcer l'adoption de telles pratiques en Europe, l'étape suivante consisterait à traduire cette décision en un plan d'action. Ce plan d'action serait assorti d'un cycle de suivi et d'évaluation, afin de s'assurer que des progrès sont réalisés en ce qui concerne le changement systémique nécessaire pour exploiter pleinement le potentiel des organisations artistiques et culturelles dans les processus de valorisation des connaissances.

Dans le prolongement de cette étude, la Commission européenne peut élaborer un plan de travail interne pour (a) définir les objectifs à court, moyen et long terme de la Commission européenne en ce qui concerne la promotion de la valorisation des connaissances par les arts, et (b) définir les actions, les responsabilités clés et les ressources nécessaires pour atteindre ces objectifs. Il est suggéré de **prévoir une évaluation approfondie** après, par exemple, 4 à 5 ans pour faire le point sur les actions politiques entreprises et réfléchir à l'impact qu'elles ont eu sur la position des organisations artistiques et culturelles dans les écosystèmes de la connaissance et leur rôle dans la valorisation de la connaissance en Europe.

1. INTRODUCTION AND METHODOLOGY FOR THIS STUDY

In recent years the European Commission has launched several initiatives to increase the impact of Research and Innovation (R&I) in European society. The Pact for Research and Innovation in Europe, endorsed by the Council in November 2021, identifies value creation and knowledge valorisation as one of the priority areas for joint action in the European Research Area (ERA). In this context, much attention is paid to a more diverse societal engagement in R&I, involving a multitude of actors such as academia, industry, citizens, public administrations, and policy makers.

On 9 August 2022 the European Commission adopted a proposal for a Council Recommendation on the Guiding Principles for Knowledge Valorisation for a common line on policy principles and measures for national, regional and local policymakers to improve knowledge valorisation. Replacing the 2008 Commission Recommendation on the management of intellectual property in knowledge transfer activities, it will align policy principles and measures for national, regional and local policy makers to maximise the transformation of research and innovation (R&I) results into solutions that benefit society. One of the guiding principles concerns specifically the need to encourage and facilitate multidisciplinary collaborations and co-creation, going beyond technological areas and involving disciplines such as social sciences, the humanities and the arts.

So far there has been no specific focus on promoting the involvement of the arts and cultural organisations in the EU Valorisation policy. With this study the European Commission wants to **investigate what role(s) the arts and cultural organisations (can) play in fostering valorisation of knowledge arising from research**, and how European policy can contribute to strengthening their contribution.

More specifically, the study aims to support the European Commission in its investigation by:

1. mapping current practices where arts and cultural institutions are actively involved in knowledge valorisation and engaging with citizens and industry

2. identifying and analysing opportunities and challenges arising from the involvement of arts and cultural institutions in knowledge valorisation processes

3. identifying the key conditions for arts and cultural professionals and institutions to fully participate in knowledge valorisation processes and the main barriers that prevent arts and cultural institutions from playing a role in knowledge valorisation processes and initiatives

4. formulating recommendations on how European policy makers can contribute to reinforcing or creating enabling conditions, thus strengthening the impact of the arts and

cultural institutions and their role in co-creation and demand-driven knowledge valorisation.

The study does so by:

- collecting almost 100 inspiring practices, with examples from 23 EU Member States and some neighbouring countries
- setting out eight case studies, illustrating how the arts participate in knowledge creation and valorisation processes, highlighting the main challenges and the impact that has been generated
- analysing the major trends and defines distinct enabling conditions for the arts and cultural organisations to foster innovation and the uptake of new creative solutions derived from research and developed in co-creation with citizens and/or industry
- outlining potential policy actions via recommendations addressed to the European Commission.

The research was carried out by IDEA Consult in the period September 2021 - February 2022, with the expert support of Prof. Dr. Bart Van Looy (INCENTIM, Catholic University of Leuven).

This report is organised as follows:

- In this first chapter, we further elaborate on the policy context for the study, present the methodology for this study as well as the main assumptions underlying the study and guiding our approach.
- In Chapter 2, we analyse the collaboration models and participation mechanisms through which arts and cultural professionals and organisations participate in knowledge processes, with a particular focus on fostering knowledge valorisation. Starting from some considerations on the existing literature, we present the main drivers for collaborations, as well as the formats and the unique set of competencies and tools that artists and institutions bring to the table.
- In Chapter 3, we present our findings on what prevents artists and cultural organisations from fully participating in knowledge creation and valorisation processes including barriers at system, knowledge ecosystem and individual actor levels. From the analysis of obstacles hindering collaboration, we move towards the identification of a number of enabling conditions necessary for arts and cultural organisations to be fully engaged in knowledge ecosystems.
- In Chapter 4, we use the transition x-curve as a framework, to take stock of how the current policy toolkit of the European Commission fosters the participation of arts and

cultural organisations in knowledge valorisation processes, to identify gaps and to make recommendations for further improvements. These recommendations aim to advise European policy makers on how they can take better account of the potential of arts and cultural organisations to promote innovation for the benefit of society. In addition, the recommendations also aim to inform the collaboration with Member States and regions in this field.

- Lastly, Chapter 5 summarises the main findings of this study and their validity, including indication on the main limitations and constraints in the findings as well as future needs for research.

1.1. POLICY CONTEXT FOR THE STUDY

NEED FOR GREATER SOCIETAL IMPACT OF R&I IN THE EU

In 2020 – in the midst of the COVID-19 pandemic – the European Commission launched its Communication on **A new ERA for Research and Innovation**. Due to major societal, economic, and environmental challenges that the European Union is facing, the single market for research, innovation and technology needed revitalisation. At the heart of this revitalisation process lies the question of **how greater societal impact can be achieved through research and innovation (R&I) in Europe**. In that respect, the Communication on the new European Research Area (ERA) emphasises the engagement of citizens, local communities and civil society as actors at the core of the new ERA.

The importance of valorising research to the benefit of society was widely reflected in the previous Horizon 2020 programme (2014-2020). In fact, Responsible Research and Innovation (RRI) was the key action of the 'Science with and for Society' objective. Responsible Research and Innovation implies that societal actors (researchers, citizens, policy makers, business, third sector organisations, etc.) work together during the whole research and innovation process in order to better align both the process and its outcomes with the values, needs and expectations of society.

In order to enhance knowledge valorisation, in recent years the Council of the European Union has asked the European Commission to develop a strong strategy to accelerate the potential uptake of research and innovation results and data[1]. Also, the European Research Area and Innovation Committee (ERAC) has repeatedly called for more effective valorisation of research results.[2]

[1] See e.g. Council Conclusions on 'Accelerating knowledge circulation in the EU' (2018).
[2] See e.g. the recommendations by the ERAC Standing Working Group on Open Science and Innovation (SWG OSI) on open science and innovation (2018) and especially to recommendation n. 4: develop end user skills for better appropriation of knowledge deriving from research.

Building further on these recommendations, the European Commission pursues an **EU Valorisation policy** to increase the impact of research and innovation investment. The policy aims to ensure that data, research results and innovation are transformed into sustainable products and solutions that benefit society, bring economic value and improve policy making. The EU Valorisation policy places much attention on a more diverse societal engagement involving a multitude of actors such as academia, industry, citizens and policy makers in order to create value through innovation benefiting all of society.

CHALLENGES RELATED TO KNOWLEDGE VALORISATION AND INNOVATION UPTAKE IN SOCIETY

The need to further step-up knowledge valorisation efforts is confirmed in the policy review '**Valorisation Channels and Tools – Boosting the transformation of knowledge into new sustainable solutions'** (2020). The review states that despite efforts at EU and national levels in recent years to increase the quantity and quality of scientific outputs and to improve policy frameworks, the achievements in terms of valorisation have not been commensurate. Still, too few researchers have a valorisation mind-set, many universities do too little to promote a valorisation culture that encourages to look beyond the academic environment and to actively engage in making research results available for broad societal use.

This is in line with the results of the H2020 project 'OpenUP'. They found that, even though a large percentage of researchers agrees that it is important to disseminate to non-research audiences, the dissemination channels specifically designed for doing so are used only by less than a third of researchers on a regular basis. Communicating to a wider audience seems therefore to be more of a trend amongst enthusiastic early adopters as opposed to a widely exercised practice. When asked about the reasons for not using innovative dissemination channels, lack of knowledge of innovative dissemination channels and methods were among the main factors hampering valorisation of research results.

Many challenges are still hampering the building of effective knowledge valorisation ecosystems. The recent report **'Towards a Policy Dialogue and Exchange of Best Practices on Knowledge Valorisation'** identifies four main challenges that are relevant to this study:

- **Incentivising and connecting valorisation partners** from research, industry and society in a more efficient way is a first condition for ensuring a comprehensive and systemic approach to the uptake of science-based solutions. However, persisting silos are a major obstacle to successful knowledge valorisation that happens at the intersection of research-economy-society and requires thinking outside the box and interaction amongst partners from different backgrounds.
- **Citizen engagement for knowledge valorisation**. A common understanding of the objectives, role and means of 'citizen engagement' in knowledge valorisation is still

lacking. Although citizen engagement and citizen science are well accepted Open Science practices, their use as a tool for R&I valorisation is relatively new and, so far, mainly limited to communication and dissemination of research results.

- **Funding of knowledge valorisation activities**. While investment in R&D is well described and monitored at EU-level, at Member State-level the public support to knowledge transfer and valorisation is less defined and traceable in terms of investment and impact. This may be largely due to the complexity of the process of turning research results into tangible societal and economic benefits. This is the subject of interventions of different national ministries and organisations, shared competences between national and regional levels, a combination of horizontal general measures and more thematic or sector-specific schemes.
- **Managing knowledge assets in open R&I systems**. Open Science/Open Innovation needs to be reconciled with Intellectual Property (IP) exploitation strategies underpinning EU policy objectives. While Open Science and Open Innovation, on the one hand, as well as IP management and protection, on the other hand, are considered very important, there is a need to better coordinate and balance these policies. This concerns all levels (political/operational) and notably the concrete implementation of these policies.

THE ROLE OF ARTS AND CULTURAL ORGANISATIONS IN FOSTERING KNOWLEDGE VALORISATION

Considering the numerous challenges, successful knowledge valorisation seems to require out of the box thinking and interaction among partners of different backgrounds. Models and practices fostering disruptive thinking through cross-sectoral, cross-disciplinary teams and informal interactions are needed. In fact, as stated in the report 'Towards a Policy Dialogue and Exchange of Best Practices on Knowledge Valorisation', creating innovative solutions means thinking out of the box of academic niches, industrial sectors, and societal boundaries. This implies finding new valorisation models and linking a broad variety of actors with different expertise and sometimes unusual backgrounds.

In this context, the arts, and especially arts-based processes and methods, can be a valuable ally to partner with academia, society, industry, and policy makers. The arts are increasingly being recognised by the research world as a stimulus to the transformation of scientific and technological knowledge into innovative products, services, and processes. They can inspire unconventional solutions and human-centred innovation. Technology-based enterprises may also embrace the arts to enhance their innovation capacity. As also highlighted in the policy review 'R&I Valorisation channels and tools', the arts can bring science and technology closer to the general public as well as an interested art public, thereby contributing to knowledge diffusion and uptake in a critical and reflective society.

Despite a growing base of literature on the beneficial role of arts and cultural organisations in knowledge valorisation processes, their involvement is still very limited. At the same time, although research on the role of arts and cultural organisations in knowledge valorisation processes has already been conducted, little literature focusses on the barriers that prevent them from playing a key role in knowledge valorisation processes.

1.2. MAIN RESEARCH QUESTIONS AND METHODOLOGY

To be able to design effective policies to foster the participation of arts and cultural organisations in knowledge valorisation processes, a better understanding about the exact role(s) of arts and cultural organisations in knowledge valorisation processes, as well as about the enabling conditions that allow them to fully participate is needed.

Starting from the objectives of the study, we have identified the following main **research questions** driving the study. These are presented in the table below.

Table 1: Main research questions

Study objectives	Research questions
Objective 1: Map current practices where arts and cultural institutions are involved in knowledge valorisation	1. What are the current practices of the arts and cultural institutions in promoting creativity and innovation through engaging citizens and/or industry? 2. What are the factors that make the practice successful? What are the barriers encountered? Are the winning factors and challenges related to the internal institutions' environment, to the broader knowledge ecosystem or to both?
Objective 2: Identify and analyse opportunities and challenges arising from the involvement of arts and cultural institutions in knowledge valorisation processes	3. What opportunities do arts and cultural institutions present for the valorisation of knowledge and engagement of citizens and industry? 4. What challenges does the involvement of arts and cultural organisations in knowledge valorisation processes pose?
Objective 3: Identify the conditions for arts and cultural institutions to fully participate in knowledge valorisation processes	5. What are the key conditions for arts and cultural institutions to fully participate in knowledge valorisation processes? 6. Based on the key conditions identified, what are the main barriers at ecosystem level that prevent them from fully participating?
Objective 4: Suggest recommendations on how European policy can contribute to reinforcing or creating enabling conditions	7. Which existing policy actions and initiatives can be strengthened at European level to reinforce the key enabling conditions? 8. Which new policy actions and initiatives should be taken at European level to create favourable enabling conditions?

Source: IDEA Consult

When assessing the information availability to answer these research questions, we observed that a screening of existing literature allowed us to gain first insights on research questions 1, 3, 4 and, partially, 2, but could not provide sufficient insights to answer the remaining research questions.

Therefore, we adopted an approach that combined different research methods, to allow for triangulation during our research and to draw accurate conclusions despite the very fragmented availability of information. This approach is summarised in the table below.

Table 2: Research approach (triangulation)

Research Method **Research Question**	Exploratory interviews	Literature review and desk research	In-depth interviews	SWOT analysis	Focus group
1. What are the current practices of the arts and cultural institutions to promote creativity and innovation through engaging citizens and/or industry?	x	x			
2. What are the factors that make the practice successful? What are the barriers encountered? Are these winning factors and challenges related to the internal institutions' environment, to the broader knowledge ecosystem or to both?		x	x	x	
3. What opportunities do arts and cultural institutions raise for the valorisation of knowledge and engagement of citizens and industry?	x	x	x	x	
4. What challenges does the involvement of arts and cultural organisations in knowledge valorisation processes pose?	x	x	x	x	

5.	What are the key conditions for them to fully participate in knowledge valorisation processes?	x	x	x	x	x
6.	Based on the key conditions identified, what are the main barriers at ecosystem level that prevent them from fully participating?	x	x	x	x	x
7.	Which existing policy actions and initiatives can be strengthened at European level to reinforce the key enabling conditions?		x		x	x
8.	Which new policy actions and initiatives should be taken at European level to create favourable enabling conditions?					x

Source: IDEA Consult

The study was structured into **four main phases.**

Phase 1: Inception

During the inception phase, the project team updated the proposed methodology, work plan and timing based on the feedback of the policy unit responsible for the study at the European Commission.

Phase 2: Mapping

In the mapping phase, the project team undertook initial exploratory interviews that provided guidance to the literature and documentary review as well as initial insights on some of the research questions. A literature review and desk research were additionally conducted to collect and select inspiring practices. This resulted in a longlist of almost 100 inspiring practices from across Europe, in which arts and cultural organisations are involved in knowledge valorisation processes.

As a first task in the mapping phase, we conducted **exploratory semi-structured interviews** to collect information that was used to further refine and enrich the literature review with complementary qualitative information. Key experts and networks that operate in the area of knowledge valorisation of R&I with arts and cultural institutions were interviewed to:

- refine the conceptual and analytical frameworks and related research questions
- indicate relevant literature and complementary qualitative information
- support the first identification of relevant inspiring examples to be considered during the case study selection
- identify important cross-cutting themes and issues we need to take into account for the rest of the study.

As for the **profile of the interviewees**, we targeted experts who have an in-depth knowledge of both the role of arts and cultural institutions in fostering knowledge valorisation and the link between arts and cultural institutions, academia and industry. These profiles can be found in several contexts: intermediary organisations and networks, cultural policy observatories, academic and policy contexts. When selecting the interviewees, gender balance and balanced geographical distribution were also relevant points of attention.

Following the refinement of the methodology and research questions, we conducted a **literature and documentary review**. Among the sources considered, the research team screened and analysed the following types of sources:

- policy documents and documents issued by public institutions
- briefs presented by relevant civil society and network organisations at European and national levels
- studies, projects and reports commissioned by public authorities (including European projects)
- research papers and books
- scientific articles
- internet sources
- public/private databases.

The exploratory interviews, literature review and desk research served to **identify and collect inspiring practices** that focus on innovative initiatives of arts and cultural institutions in terms of the way they support, enhance and foster dissemination of knowledge and research-based innovation, by engaging citizens and the industry. The main aim of the overview of inspiring practices was thus not just to provide a detailed description of current practices or initiatives found in the sector. The objective was rather to focus on innovative practices that inspire and stimulate reflection about opportunities that currently might still be underexplored, but have the potential for wider positive impact on all the stakeholders involved, if the practices were implemented on a wider scale. As such, the overview of inspiring practices added useful insights and fed into the SWOT analysis and formulation of policy recommendations. For the selection of the practices, we started from a longlist of initiatives that were identified during the literature review and desk research. To allow for a

meaningful documentation and analysis, we developed a **list of criteria** to select the practices.

Table 3: Framework for selection of inspiring practices to be included in the inventory

Relevance	The inspiring practice involves at least one arts and cultural institution. The inspiring practices will cover all the roles that arts and cultural institutions play in fostering knowledge valorisation and building bridges between academia, society and the industry. Hybrid practices combining several roles are also in the scope.
Effectiveness	The inspiring practices provide evidence on the reached or expected results. The practice has to contain indications on outcomes and takeaways, as well as on potential or actual impact.
Geographical scope	The initiatives need to cover at least 10 Member States of the EU and a good geographical balance distribution of (macro)regions across the EU (Northern Europe – Southern Europe – Western Europe – Eastern Europe).
Diversity	The selected initiatives have to reflect the diversity of arts and cultural institutions, in terms of mission, size and governance structure, and the diversity of typology of initiatives launched (e.g. one-off project, ongoing programme, strategic partnership, etc.).
Time frame	The inspiring practices need to be relatively recent or ongoing (having been launched in the last five years).

Source: IDEA Consult

Phase 3: In-depth analysis

The in-depth analysis phase builds upon the results from the previous phase. Starting from the longlist of inspiring practices, eight case studies were selected for further analysis via in-depth interviews.

The **selection of the case studies** was based on the following criteria emerging from the conceptual framework and from exchanges with the European Commission:

- The initiatives ensure a good **geographical balance distribution** by (macro)regions (Northern Europe – Southern Europe – Western Europe – Eastern Europe) and cover at least 10 Member States (or neighbouring countries) of the EU.
- The practices take place thanks to the establishment of (formal or informal) **collaborations with other actors of the knowledge ecosystem** and include a component of **engagement with civil society.**
- The selected initiatives reflect the **diversity of arts and cultural institutions**, in terms of profiles covering artists and creatives, museums and institutions, hybrid organisations and intermediaries.
- The selection guarantees a **balance between temporary** and one-off initiatives/projects **and permanent** programmes/organisations.
- The practices need to be relatively **recent or ongoing** (having been launched in the last five years).
- The selected practices provide information on the **attained or expected results**.

The eight case studies add to the existing literature by providing an in-depth case-based analysis of two main aspects:

- Artistic competencies and arts-based processes participating in knowledge co-creation and/or valorisation processes
- The role of mediators and their ability to create platforms for exchange and long-term connections

In this phase, an analysis of the strengths, weaknesses, opportunities and threats (SWOT analysis) was conducted. We structured the insights gathered and analysed in the previous tasks in a **SWOT framework**. The main aim of the SWOT analysis was to come to the identification of the main enabling conditions at ecosystem level, for the arts and cultural institutions to fully participate in knowledge valorisation processes. After the identification of all the four elements (Strengths, Weaknesses, Opportunities, Threats), the following questions arose:

- How can weaknesses be turned into strengths in the future? Which are the main internal and external intervention areas? Which are the main gaps to be filled at internal and external levels?
- How can threats be turned into opportunities (internal / policy levels)? Which are the main internal and policy solutions already available? Which are the main gaps to be filled at internal and policy levels?

Reflection about these questions led to identifying the **enabling (ecosystem) conditions** and **barriers** to the role of the arts and cultural organisations as actors in knowledge valorisation policy and to the consequent first drafting of **policy recommendations**.

Phase 4: Policy recommendations and final reporting

Based on the analysis of the main enabling conditions and issues/barriers that demand further action, a final objective of this study was to inform EU policy makers engaged in knowledge valorisation policy about how the European valorisation policy can take account of the arts and cultural institutions and empower them to promote innovation for the benefit of society. To this end, we made use of the x-curve for transition model to reflect on **how EU policy makers can support the transition towards a more enabling ecosystem** in which new infrastructures are created, to limit/remove the barriers for participation and to fully empower the arts and cultural institutions to take part in knowledge valorisation processes to the benefit of the whole society.[3] We then reflected on the potential overarching and specific actions that policy makers can take to reach these goals.

In the final phase, a **focus group** was organised. During this focus group the draft findings and policy recommendations were presented to a selected group of experts and policy makers. Based on that, the recommendations were discussed with the participants in an interactive setting.

The focus group brought together experts on the topic and policy makers involved in valorisation policy, in a panel composed of 12 persons. We strived for a gender-balanced and diverse panel in terms of profile, to ensure a participatory atmosphere and lively debate. Some of the interviewees involved in the previous phases also participated in the focus group.

In conclusion, a draft final report was sent to the responsible EC policy unit, followed by a meeting in which we presented a summary of the main findings, key messages and recommendations, as well as exchanged on lessons learnt from the implementation of the study. The work culminated in this final report.

[3] We refer to chapter 0 for a more detailed explanation of the x-curve for transition model.

In addition, it is important to note that the main findings of the study were presented during the "Put citizens in the picture: Arts facilitating knowledge valorisation" webinar, organised in the context of the European Knowledge Valorisation Week 2022.

1.3. CONSIDERATIONS UNDERLYING THIS STUDY

Important initial considerations underpin this study and are necessary to set the scene that served as a framework to conduct this research:

1. We consider **arts and culture as indisputable contributors to research and innovation in society** and key drivers of innovation. Based on this assumption and the requirements for this study, the aim of this research is not to investigate how the arts participate in research & innovation (R&I) ecosystems in general. The specific objective is to understand what the potential of involving the arts in knowledge processes is, with a particular focus on how this knowledge is disseminated and valorised.

2. We define knowledge **valorisation** as the process where knowledge is effectively absorbed by target groups, final users and society in general. Fostering knowledge valorisation can happen in all phases of the knowledge chain or knowledge flow – from formulating the right research questions through to communicating on new research results or innovations, and transforming data and research results into sustainable products and solutions that benefit society. The knowledge chain itself is not seen as a linear process from scoping to valorisation, but rather as a messy process, with a lot of back and forth.

3. We acknowledge that there are various types of knowledge (e.g., explicit, tacit) and that it can be generated in a variety of contexts (e.g., formal, informal, academic, industrial). However, in the context of this study, we **focus on knowledge as the output of a research process** that can take place in various contexts, namely universities and research institutes, independent research organisations (such as think tanks and non-profit organisations), and industry.

4. We adopt the **definition of knowledge ecosystem provided by the OECD, namely**: "*Innovation ecosystems are diverse networks of actors who work together to develop new ideas, products or services which address shared goals. These "ecosystem partners", who often come from across the private sector, the public sector, research institutions and civil society (known as the 'quadruple helix), commit to work together and share resources to identify, understand and act upon opportunities and threats.*"

5. We recognise that knowledge can be produced in a variety of disciplinary domains: natural sciences, health science, social sciences, engineering, industry and technology, arts and humanities, etc. Therefore, we consider the arts as an important source of

knowledge and we recognise that they have their own modes of research and knowledge creation. However, this study takes **as a starting point the knowledge that is created in disciplinary domains other than the artistic one**. This is done to investigate how arts and cultural organisations can:

- take part in the creation of new (transdisciplinary) knowledge, either for a common goal or for individual interests, always with the perspective of fostering knowledge valorisation

- step in to valorise this knowledge (once it is created).

This study does not investigate how research in other knowledge domains contributes to the artistic practice.

6. Although recently there has been a change in the view of the relationship between research and society, with greater attention to societal impact, the technology transfer model as an ideal-type model for how research creates wider economic (and possibly societal) benefits is still strongly internalised in innovation policy frameworks. A too narrow concept of valorisation is still present.

7. In the context of this study, it is important to remark that the concept of **valorisation is intended as a much broader category than pure technology transfer and the valorisation of knowledge coming from the Science, technology, engineering, and mathematics (STEM)** disciplines and that, although the impact of social research and humanities are not often as quantifiable as that in other disciplines, this does not make it any less important to society.

8. When conducting the research, we have looked at two main bodies in the arts and cultural sectors, namely **individual artists/cultural workers** and **arts/cultural organisations**. In fact, each body contributes in different ways to knowledge valorisation and has different potentialities:

    - Individual level: artists and individual cultural/creative professionals act as creative thinkers, sources of R&D, repositories of specific skills and competencies. They can either be incorporated within an organisation or work as freelancers. Often, they are involved in research and innovation-oriented processes and projects due to their creative and unconventional attitude and research approach, as well as their expertise with artistic methods.

    - Organisation level: arts organisations, museums, hybrid organisations, among others, serve as a common space where the bridge between various stakeholders is built – a space that is often difficult to find in research environments. Their importance lies not only in being mediators between domains, but especially in the arts-based

language utilised to create links, build bridges and engage with knowledge actors (including research target groups and citizens).

9. We are aware that, while there are artists who actively explore transdisciplinary collaborations and engage in knowledge valorisation as a core part of their artistic practice, there are also artists who are not interested in such multi-actor collaborations and who do not pursue objectives other than the artistic/aesthetic act. We acknowledge that the two perspectives are both extremely relevant in society and will continue to co-exist together. The purpose of this study is **not to promote one perspective over the other, but merely to share evidence on the opportunities** that collaborations between artists/cultural organisations and other R&I partners can bring to better valorise knowledge for the benefit for society. In addition, it highlights the benefits that these collaborations bring to the different participants and their work, and **support European policy makers in designing a policy framework that is conducive to such collaborations**. The choice remains with all individual actors – both arts and other R&I partners - to engage or not.

2. THE ROLE(S) OF ARTS AND CULTURAL ORGANISATIONS IN KNOWLEDGE PROCESSES

2.1. REFLECTIONS ON THE STATE OF THE ART

For this study, a wide variety of sources has been screened and analysed to examine the topics under investigation. These include academic papers, government-commissioned reports and studies, project reports, policy reports and web articles. The triangulated analysis of these sources has brought out **some considerations on the state of the current literature available on the subject**:

- there is a **general lack of studies and publications that address the theme** of the role and benefits of artists and cultural organisations in knowledge valorisation processes **in a holistic way**. Most of the literature examined focuses either on dissemination/communication practices or on art-science co-creation processes. The focus on one or the other, but rarely on both, is illustrative of the **fragmented view** on how artists and cultural organisations can play a role in valorising knowledge. An all-encompassing view of how arts and cultural organisations take part in knowledge creation and valorisation processes is missing.
- The current literature **rarely takes the perspective of knowledge valorisation processes** and how they are enhanced by multi-actor collaborations and by partnering with arts and cultural actors.
- There is almost a total **lack of studies and frameworks assessing the impact** generated by transdisciplinary collaborations within research creation and valorisation processes. The information is fragmented and mainly proposes case studies or examples of good practices. There is also limited and scattered evidence on the role and benefits of artists and cultural organisations in knowledge valorisation processes, and as such there was the need for complementary analysis to serve the purpose of this study.

The **inputs coming from the exploratory and in-depth interviews** and **focus group**, together with the analysis of the **long list of collected practices** and the elaboration of **case studies**, have greatly benefited the definition of an analytical framework and have made it possible to approach the topic in a holistic way. For this reason, these inputs have been harmonised with the insights deriving from the literature review.

The next sections present the main findings of this study, in the form of main trends of the involvement of the arts and cultural organisations along the knowledge chain and lessons learned. As mentioned, these reported findings are the result of a triangulation exercise. The

exploratory interviews, the analysis of the long list of practices and case studies, the screening of existing literature and the results of the focus group have jointly fed the results presented in the next sections.

2.2. DRIVERS OF COLLABORATION

Looking at the contribution of arts and cultural organisations from a holistic perspective, we use the concept of **knowledge creation flow**, a chain that encompasses all the steps necessary to generate and circulate knowledge:

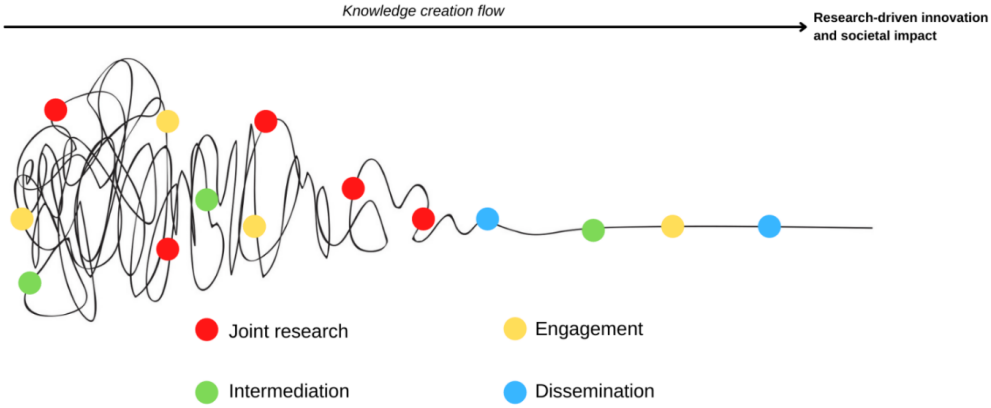
- **Scoping**: this concerns the first phase of a research process where researchers build their research questions and assumptions to be used as a foundation for analytical thinking. This is the phase in which research ideas start to form and the research methodology is designed.
- **Creation**: in this phase, knowledge is produced thanks to scientific research processes based on the investigation of evidence, discussion, prototyping (if applicable), modelling, testing, etc. This process aims to answer the research questions previously formulated.
- **Valorisation**: this refers to the process of being able to convert knowledge into value for society (commercial and societal value). Knowledge valorisation is a non-linear process where knowledge is effectively absorbed by target groups, final users, and society in general. This process is affected by interactions with multiple actors throughout the phases of the knowledge flow.

Although presented sequentially, **the knowledge creation flow is not a linear process** in which all the steps are consecutive. It is often a tortuous process where research questions (scoping) are constantly under revision and where valorisation is a process (ideally) implemented throughout the entire creation process, from scoping onwards.

In general, we observe that **the arts (both at the individual and organisational level) play a role in all steps along the knowledge creation flow or have the potential to do so.** As shown in Figure 1, current thinking about the role of arts and cultural organisations in knowledge chains tends to see their contribution in all the steps along the chain, from the scoping and creation/production (the creative and non-linear processes) to valorisation. All contributions along the chain are equally important and contribute to knowledge uptake.

Figure 1 : Participation of arts and cultural organisations along the knowledge creation flow

Source: IDEA Consult (built on the Design Squiggle illustration)



The triangulated analysis of literature, practices and experts' inputs indeed confirms that artists and cultural organisations take part in all the phases of the knowledge flow. They do so with a variety of purposes, that we call **drivers of collaboration.** Based on the analysis, we distinguish four different models. It is very common for these collaborations to be activated for a variety of simultaneous purposes and not as stand-alone practices. Therefore, although presented in separate sections, it should be emphasized that **most of the practices analysed are hybrid and multidimensional**. A holistic view must therefore be adopted.

1. Joint research

In joint research models, arts and cultural organisations feed into research already in the scoping phase. They instil new thinking and research questions and connect researchers and society with future scenarios and complex societal issues. This so-called **'speculative thinking' role of the arts** focuses on the speculative intent of the collaboration with other knowledge actors, beyond the final research outcome.

It is often argued in literature that science has been splitting up into numerous paths of ever deeper specialisation, seeking knowledge within reductionist paradigms. It is also often remarked that it has largely abandoned free science, with the risk of losing the global vision and the ability to reflect on future scenarios/(un)imaginable futures in a holistic way. Art - at the price of the mainly precarious employment conditions of its professionals - still offers more degrees of freedom, openness and trust.[4]

[4] G. Stocker, A. J. Hirsch, *The Practice of Art and Science*, 2021.

These types of collaborations, linking up artists, cultural organisations, researchers, citizens and representatives of industry therefore aim to build a culture of creative thinkers who join together to combine their knowledge and skills to create new visions for the future.

Box 1 : Examples of practices of the arts participating in scoping and co-creation processes

Ars Electronica Futurelab - Beyond the Frame – 8K Future Projects: this collaboration focuses on several key scenarios that explore the framing and application of 8K television content, based on questions of image composition, new content and forms of staging.

3D printed steel bridge: The world's first 3D printed metal bridge, designed and built thanks to the collaboration between artists, designers, industry, scientists and local policy makers. All actors collaborated to configure the future urban space. What makes the case interesting is that the key drivers were art/design and technology. They determined together what would be the best result under the challenging circumstances of a lack of time, budget and people. Because the creative driver was so strong, all the rest of the participants got a clear directive from the beginning.

Sources: Ars Electronica Futurelab and The first 3-D printed steel bridge – Ars Electronica Blog.

In several joint research cases, arts actors also participate as **partners in knowledge co-creation processes**. In this case, arts, science, and industry stakeholders cross-fertilise and co-produce knowledge by collaborating towards a shared outcome to solve a shared problem. The type of relationship is of a peer-to-peer and reinforcing nature building on mutual understanding. Existing literature and insights from interviewees point out that this practice typically involves individual artists and hybrid organisations with a strong vocation for innovation and cross-sectoral research, rather than traditional cultural organisations.[5]

This model sees artists and organisations involved in the creation process as **peer researchers**, rather than brokers or connectors. They are often involved in prototyping activities and the development of new concepts or ideas. The co-production (art-science) is innovative from the point of view of the research approach and might also lead to greater market potential. However, this trend inevitably carries with it the risk that the research produced remains locked in academic niches, if not duly linked to a valorisation strategy or wider public engagement from the very beginning. In order to make co-produced research 'practice-ready', valorisation should be embedded into the research process from its inception. Doing so requires research to leave the academic environment and for it to be

[5] The Art-Driven Innovation method is developed by In4Art to generate ideas and include the insights from artistic experiments on technological and social domains to achieve more responsible innovations); EUNIC, 6 current models for collaboration between artists and technologists in the United States, Art + tech report 2019, see https://artdriveninnovation.eu/.

complemented with new ways of creating knowledge (e.g., using living labs, new tools and methodologies, new alliances).

2. Intermediation

In the intermediation model of collaboration, arts and cultural actors take up the **role of facilitating the connection between various and diverse stakeholders**. They act as bridge-builders and connectors between research (academia and research organisations), industry and/or society (citizens and communities). This connecting/intermediation action may be limited to a specific project or, on some occasions, may result in strategic structured (long-term) partnerships. The role of the intermediary is often played by hybrid organisations, born with the precise mission to serve as an environment where the different stakeholders can interact and connect, both on a project or more regular basis.

In literature, intermediaries are defined as cultural producers, curators, mediators, or translators between the fields, and facilitators who guide the project and help to communicate the project to the microcosmos of the organisation in which it is embedded and beyond. "*This person or organisation has to be able to grasp the artistic and scientific value and impacts of the work, and to contextualise it within the organisation and the disciplinary fields*".[6]

Box 2 : Examples of practices of the arts activating mediation processes

Hexagone Scene nationale arts sciences 'Avec vous' programme – France: A joint research laboratory uniting artists and scientists. The mission is to put artists, scientists and society in touch with each other. Artistic practice workshops, debates, meetings with artists, discovery of the latest innovations, among others, are all opportunities to create social ties, develop a critical eye and expression, discover other cultures and other points of view on the world.

Show & Tell - Belgium: a programme for companies from all sectors in which companies present an issue they cannot solve and then they connect (speed dating format) with artists/makers to find a possible approach. Its objective is to show the opportunities and the impact that creative and artistic professionals can have on the developments in the field of our physical environment at work locations. The maker has the opportunity to inspire with his own work and to enter into a conversation with these institutions and companies about the role of art in a rapidly changing living environment.

Sources: Avec vous - Théâtre Hexagone Scène Nationale Arts Sciences | saison 2021-2022 (theatre-hexagone.eu) and Show & tell | Logistiek landschap (kunstlocbrabant.nl).

[6] C. Schnugg, Creating ArtScience Collaboration, 2019.

3. Engagement

The arts and cultural organisations also serve as a **space for experimentation and citizens engagement**. Hybrid spaces, such as citizens labs, creative hubs and maker spaces, among others, are the place where citizens can not only familiarise themselves with research results and their benefits for society in a participatory way, but also co-create new research-based visions and solutions related to specific issues. These hybrid spaces can be incorporated into an institutional environment (e.g., museum labs) or can be autonomous entities.

These hybrid spaces do not only act as platforms where different actors can interact. Thanks to the transdisciplinary and transversal skills of their professionals (artists, makers, out of the box thinkers, etc.), target groups are mobilised and engaged in participatory processes.[7] These hybrid spaces are often the places to incubate creativity and innovation through interactions between the science and creative fields.[8]

As shown in Figure 1, these practices are usually activated along the entire knowledge chain. The participatory process can in fact be activated both in the scoping and creation phase (in this case we can talk about citizen science), as well as for valorisation purposes. Existing literature highlights that these practices fit into a context of an open citizen-centric, user-driven innovation system, an idea incorporated into the Quadruple Helix model.[9] While traditional approaches to innovation systems are still based on the cooperation between academic organisations, private corporations and governments (triple helix model), the quadruple helix model allows individuals, schools, civil society organisations and the general public to enter the research and innovation system.

What clearly emerges from literature is that these hybrid spaces are just emerging within the current R&I systems and that, although not yet considered as generators of new academic knowledge, in practice they produce knowledge-based innovations outside of the official research and innovation system.

Box 3 : Examples of practices of the arts participating in engagement processes

Remix el Barrio - Spain: it was born with the ambition to propose a learning space to encourage and nurture new practices based on food-waste crafts. It is the result of a pilot program where various designers learn about biomaterial design and explore projects with food scraps using artisanal techniques and digital fabrication.

[7] A. Bandelli, *Museums as brokers of participation: how visitors view the emerging role of European science centres and museums in policy*, Science Museum Group Journal, 2015; https://www.interaliamag.org/interviews/claudia-schnugg/. See also S+T+ARTS Collaboration toolkit, July 2020.

[8] KiiCS Art & Science for Innovation - A Guide to Incubating Innovation in Art and Science (the KiiCS project is supported by the European Commission within the Seventh Framework Programme).

[9] A. Serra, Citizen labs, basis for universal innovations ecosystems, ECISTE online SPOKES series; R Arnkil, A Järvensivu, P Koski, T Piirainen, 2010, Exploring quadruple helix outlining user-oriented innovation models.

Remix El Barrio was created in the regenerative district of Poblenou, more specifically in the ecosystem of Fab Lab Barcelona, where designers united to co-produce new forms of crafts from their individual aspirations, benefitting from regular peer-learning sessions, access to machines and tools, and learning from the maker open-source culture present all over the place.

Bioart Society – Finland: this is a Helsinki-based association developing, producing and facilitating activities around art and natural sciences with an emphasis on biology, ecology and life sciences. The association runs a space called SOLU, an artistic laboratory and platform for art, science and society in Katajanokka, Helsinki, and - together with the Kilpisjärvi Biological Station of the University of Helsinki - Ars Bioarctica, an art & science program with a focus on the sub-arctic environment.

Sources: Remix el Barrio, Food Waste Biomaterial Makers – STARTS PRIZE (aec.at) and SOLU / Bioart Society | Projects.

4. Dissemination

The arts and cultural organisations are increasingly involved in the dissemination of research results, due to their ability to communicate in an unconventional way. Arts and cultural organisations critically convey research results from academia and the research world to society and its sub-target groups (young people, adults, students, old people, etc.), by using arts-based solutions, such as exhibitions, interactive events, virtual reality, etc. They **translate complex content into comprehensible language and open up new sources of knowledge and information**. The involvement of artists and cultural professionals was also particularly relevant during the Covid-19 crisis. Several examples show how artists were involved in the communication and dissemination of information about the pandemic and the relevance of hygiene measures.[10] This role is based on a **functional relationship model**, in which arts and cultural organisations serve academia and the disseminate its research results.[11] At the same time, the arts and cultural organisations can give a voice to (critical) reflections, doubts, fears or other emotions in society that come with new knowledge and innovations, thus also fostering the dialogue between researchers and civil society.

This set of communication and dissemination practices can be more or less engaging and participatory and can involve more or less partners. Based on our analysis, we conclude that the greater the level of engagement of audiences and communities and the number of partnerships established, the greater the innovativeness and effectiveness of the approach

[10] http://artistsagainstaninfodemic.org/ and https://www.globaltimes.cn/content/1182486.shtml.

[11] M. Achiam, A framework for understanding the conditions of science representation and dissemination in museums, Museum Management and Curatorship, Volume 29, 2014 - Issue 1; J. Lapum, Arts-Informed Research Dissemination in the Health Sciences An Evaluation of Peoples' Responses to "The 7,024th Patient" Art Installation, SAGE Open 4(1), March 2014.

to convey research results to the general public. Usually, the most interactive dissemination methods actively involve audiences.

Box 4: Examples of practices of the arts participating in dissemination processes

Oceans Space – Italy: a planetary centre for exhibitions, research and public programmes catalysing ocean literacy and advocacy through the arts. Its aim is to engage and involve the audience on issues concerning the pressing challenges facing the environment and society around the world, with the aim of establishing a new "ocean generation". One of the main objectives is to help foster the growth of the number of future citizens with an awareness of the ocean's importance to humanity, and convey the message that oceans are a vital resource that needs to be protected to safeguard the existence of all forms of life on planet Earth.

The Dancing Particles - UK: this research project won the first Public Engagement with Research Award by the European Research Council (ERC) in the category of public outreach. The project looks at the origin of mass by exploring the interactions of the elementary matter particles with the Higgs boson. The underpinning idea was to engage the public in activities that educate and potentially inspire them about particle physics through art. There were three pillars. First was the engagement with artists per se. The second pillar was to engage with the public. Finally, the third pillar was engaging with students.

Sources: Exhibitions | Ocean Space (ocean-space.org) and The dancing particles | ERC: European Research Council (europa.eu).

2.3. FORMATS OF MULTI-ACTOR COLLABORATIONS

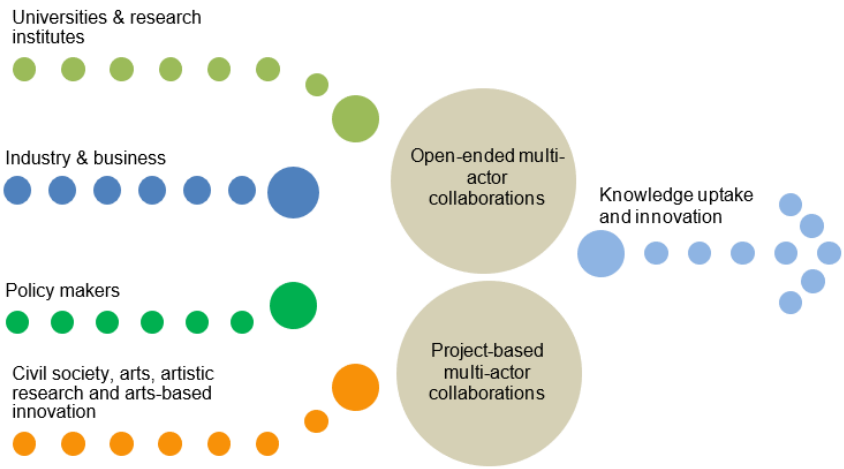
In this section, we discuss the **formats** through which multi-actor collaborations occur. Interviews and literature review reveal that the main channel through which arts-based processes of knowledge creation and valorisation occur is the **collaboration between multiple actors of the quadruple helix**.

Contrary to the traditional definition of Quadruple Helix that includes civil society in the model (the fourth helix), an innovative perspective by Carayannis and Campbell **adds as a fourth helix: the "media-based and culture-based public", the "civil society" and "arts, artistic research and arts-based innovation".**[12] The reason why the role of the arts is stressed is attributed to their being a driver in forming inter-science and transdisciplinary configurations and networks. Arts and cultural actors, arts-based research, and arts-based innovation contribute to co-creating the basis for new models of economic growth and social

[12] E G Carayannis and David FJ Campbell, Developed democracies versus emerging autocracies: arts, democracy, and innovation in Quadruple Helix innovation systems, Journal of Innovation and Entrepreneurship 2014, 3:12.

sustainability. This indicates opportunities for the evolution of a knowledge economy, a knowledge society, and a knowledge democracy. The case studies in Annex show how these types of collaborative valorisation and co-creation practices develop in practice. In the next chapter, we investigate what are the obstacles encountered and the conditions for the theoretical model to be effectively translated into practice.

Figure 2 : Quadruple Helix model (considering arts actors under the 4th helix)



Source: IDEA Consult (visual representation of the model developed in Carayannis and Campbell, 2014).

These **collaborations can occur in different formats and can involve two or more actors** at the same time.

1. Open-ended multi-actor collaborations

Collaboration can take place in open-ended and non-linear processes that do not aim to produce a specific research output, but which are simply inspired by a common vision to explore or to create a common open-ended project, based on a peer approach, trust and transparency. They can be established to start either a long-term co-creation process, a future-oriented valorisation pathway or both. It is important to note that in these types of less structured and long-term collaborations, the arts are seen as a research partner and not as a mere contributor.

An important place to set up these open-ended collaborations are physical exchange platforms where different actors can meet. These platforms are often permanent physical

spaces such as hubs and labs that allow for unexpected encounters and networking between actors who would not have met if these platforms had not existed.[13]

Some examples of multi-actor long-term collaborations are provided in the box below.

Box 5 : Example of open-ended collaboration

Waag Future lab - the Netherlands: Waag is a Future Lab for technology and society. Its objective is to reinforce critical reflection on technology, develop technological and social design skills, and encourage social innovation. Waag works in a transdisciplinary team of designers, artists, and scientists, utilising public research methods in the realms of technology and society. Waag empowers as many people as possible to design an open, honest, and inclusive future. Waag's activities primarily take place in research labs, where research and development are carried out on technological and social issues. As part of its public program, Waag organises workshops, exhibitions, and debates. Additionally, Waag offers educational courses on creative technology and society with its Waag Academy program.

Source: Waag: Future Lab for design and technology | Waag.

2. Project-based multi-actor collaborations

Collaboration between quadruple helix actors can also take place with the aim of working towards a mutually agreed and defined outcome. These collaborations often occur in pre-established research processes or in project-oriented activities and have a temporary nature. The role of the artists or cultural organisations is more structured, and aims to either participate in the knowledge creation, in the valorisation phase or both. Being project-based, these types of collaborations do not necessarily originate from a common overarching vision, but rather derive from the willingness to reach a specific objective (to co-find a solution to a common problem, to co-produce a specific output, to co-valorise certain knowledge, etc).

The establishment of these types of collaborations is facilitated by both the above-mentioned platform for exchange and periodic events such as festivals and thematic weeks that are in turn very often promoted by the same organisations/platforms. We also observe that occasions for project-based collaborations are often stimulated by targeted funding opportunities that financially support these types of partnerships.

The box below provides examples of some types of project-based collaborations.

[13] This was an insight shared unanimously by all interviewees, both in the exploratory and in-depth phase.

Box 6 : Example of project-based collaboration

Technology & Art & Commerce - Austria: this short- project-based collaboration between scientists and a cultural organisation led to an exhibition at the Kunsthalle Wien. It provided scientifically grounded – and playfully presented – insights into images used in the media. The exhibition focused on the dynamic relationship between technological developments and their use in commercials ad films. The initiative is funded by the Austrian Science Fund FWF – and thanks to numerous outstanding project proposals, has led to an extremely positive "funding balance" for the republic. The entire project was financed in the context of the European ERA-NET scheme HERA (Humanities in the European Research Area) as a Joint Research Programme (JRP). This is an initiative of a total of 13 European funding organisations and the European Science Foundation (ESF) with financial support from the European Commission.

Source: Technology & Art & Commerce: Kunsthalle Wien Takes a Scientific Look at Advertising (fwf.ac.at).

Regardless of the permanent or temporary nature of the collaboration, in both cases we observe that:

- Arts actors and cultural organisations take part in these collaborations building on different knowledge and methods they bring to the table, in other words they contribute to the multi-disciplinarity of the knowledge creation and valorisation process. As rightly pointed out by some interviewees, collaborations with arts and cultural actors are very often activated for one main reason: to benefit from their skills and the potential that all other knowledge ecosystem actors do not have. In other words, because, regardless of what the set goal is, the (open-ended or prefixed) goal could not be achieved so effectively without collaboration with the arts and cultural organisations.
- The challenges we are facing at societal level are in fact complex and the relevant knowledge produced is hardly exploitable by adopting a one-sided approach. Sociology and other disciplines have highlighted over time that complex problems require bold and unconventional solutions. In particular, interdisciplinarity is more often viewed as offering a response to the widely perceived multiple complexities of the modern age. A single disciplinary approach is no longer considered adequate to analyse or communicate about the complexity of today's issues.[14] It has now become apparent how important it is to leave one's world in order to really get to the bottom of the complex

[14] Grahame F Thompson (2016), *Interdisciplinary complexities*, Journal of Cultural Economy, 9:3, 322-329.

problems of the present and future, to look at them from a different perspective and to gain new perspectives on them.[15]

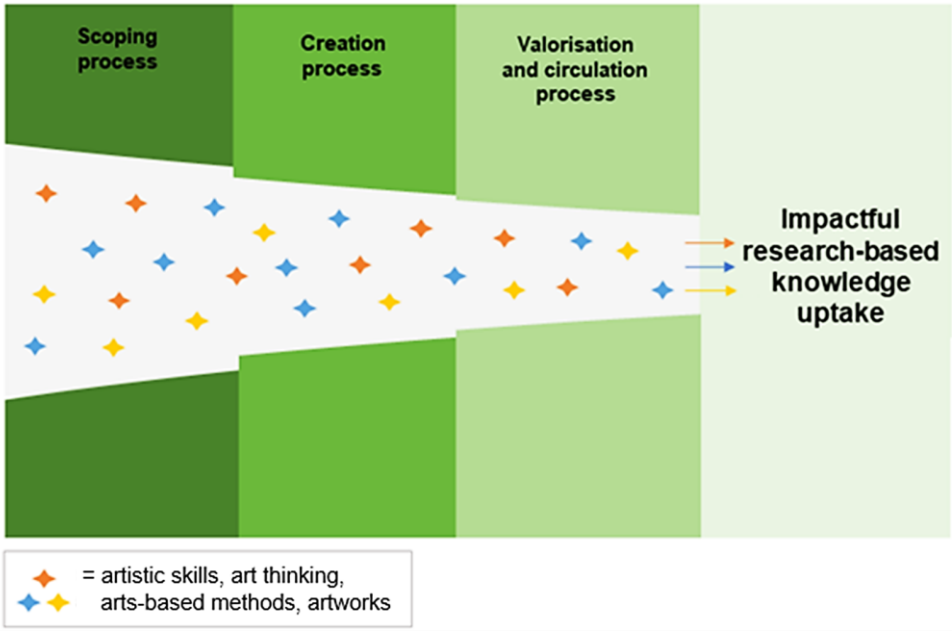
- The role of intermediaries in both types of collaborations is evident and both the analyses of practices and the literature confirm that. Intermediaries are organisations or individuals that enable collaboration, by both "*seeking artists, scientists, organisations or companies that share a mutual interest, or indirectly by enabling or facilitating the collaborative capacity of regions, nations or sectors*".[16] They can be either individuals (such as independent researchers, artists or cultural freelancers) or cultural organisations and hybrid organisations (such as creative hubs, living labs, citizen labs) with a focus on network facilitation. They could be social impact-driven organisations, or they could be (platform) organisations with a focus on research and innovation. Intermediaries play a key role in supporting activities that close the gap between art, science and industry, and bring actors closer to citizens. Their role is also crucial in thinking beyond the 'experimental' nature of the practices and to think long-term.
- As for the more operational aspects of these collaborations, we observe that several methods can be used to facilitate these collaborations and their specific objectives. They can take the form of workshops, focus groups, hackathons, brainstorming, serious games, and residencies. In general, open dialogue and discussion seem to be the main (open) method through which various actors interact and collaborate. In general, strict models of collaboration tend to leave room for open patterns that embrace open innovation, experimentation and sensitivity to the needs of project research and national contexts. This is especially relevant for valorisation processes where the (research-based) knowledge derives from the humanities. Contrary to other disciplinary domains, researchers in this domain tend to privilege open methods for collaboration and, as previously anticipated, tend to team up with artistic partners for both creation and valorisation purposes on a regular basis.[17]

[15] https://ars.electronica.art/aeblog/en/2021/09/29/where-science-meets-society/
[16] S+T+ARTS Collaboration toolkit, 2020.
[17] Public Engagement, Knowledge Exchange and Impact: A Toolkit for HERA Projects, developed by Prof. Jo Sofaer (University of Southampton), Prof. Tony Whyton (Birmingham City University), Dr Craig Hamilton (Birmingham City University) and Elysia Greenaway (University of Southampton).

2.4. A UNIQUE SET OF COMPETENCIES BENEFITING KNOWLEDGE VALORISATION

Beyond the specific type and purpose for collaboration, we observe that what makes the contribution of arts and cultural professionals unique is the **unique set of competencies and tools** that these actors are able to provide when taking part in knowledge creation and valorisation processes.

Figure 3 : Unique arts-based toolbox for knowledge creation and valorisation



Source: IDEA Consult

Artists and cultural professional have **artistic skills** that they use to present narratives in many ways, such as a series of images, sounds or words representing moments in a story, or by selecting a central moment to stand for the whole story. Sometimes, however, artists invent their own stories, leaving the viewer to imagine the narrative.[18] Most importantly, artists and cultural professionals can often **stimulate the development of creative skills in others**, thus impacting the absorption of knowledge. Knowledge (valorisation) in creative practice is increasingly seen through the process of creating links, mediating between various actors and encountering art rather than in any perceived final form.

[18] I. Sutherland, S. Krzys Acord, *Thinking with art: from situated knowledge to experiential knowing*, Journal of Visual Art Practice, 6:2, 125-140.

Box 7 : An example of unique artistic skills

Visual art as a way to communicate climate change: a psychological perspective on climate change–related art: several projects and studies show that art typically uses novel metaphors, analogies or narratives, which climate communication generally lacks. In addition, art can provide people with visualisations of the problem and give them a personal experience with the subject matter. This is especially important regarding climate change as many people still see it as an abstract issue that poses no direct threat. Art may also help to establish a collective identity and to give people a sense of being supported in their efforts to help combat climate change.

Source: Visual art as a way to communicate climate change: a psychological perspective on climate change–related art: World Art: Vol 8, No 1 (tandfonline.com).

Art thinking. The arts are able to alter the way in which we experience the world. The analysis highlights that **art thinking** is the process of applying artistic thinking and an artful view to a broader range of challenges, related to a variety of topics (humanity, technology, nature and science, health, etc.). The literature provides several examples of art thinking processes and it seems that, in general, there is agreement on the characteristics of such form of thinking. While design is a solution to shape a service or product, art can act as a compass posing the right questions with the aim to see new possibilities and open up towards new directions.

"Art holds the power to scrutinise existing beliefs, cast doubt on common perceptions, and find a way to think outside the box. They detect social and technological trends that are not yet given a name, and give a form to communicate those micro trends tangibly".[19]

The concept of art thinking has had scarce mention in academic publications and it has only recently become popular.[20] One of the most relevant examples of how the concept of art thinking has been developed and applied is given by the Ars Electronica Futurelab. The lab developed a concept of art thinking as a response to and differentiation from a design thinking mindset, although the two were never put in opposition. From the perspective of Ars Electronica, art thinking is not meant to be understood as a methodology but rather as an attitude, a way of explaining the role of mindsets and cognitive skills of artists in multi-actor collaborations.

[19] https://ars.electronica.art/futurelab/en/research-art-thinking/.
[20] K. Minski, Collaboration in experimental art: case studies in co-creation, trans-disciplinarity and art-science practice at Ars Electronica Futurelab, PhD thesis, 2020.

Recent literature stresses that the three key characteristics of the art thinking mindset are: [21]

- emotional engagement: suggesting that artists have more "emotional feeling" than scientists and (unconsciously) use empathy as a way to explore emotional states and conflicts or as a means of problem-finding (or concept/theme-finding) and solving;
- intuition: connected to emotional engagement, intuition is another key point of emphasis in art thinking. For artists, ideas do not always arise from an assignment, but they spring internally from life experiences and knowledge of their medium. Contrary to others, artists make connections and associations between embedded knowledge[22];
- tolerance of ambiguity: as an integral part of their process, artists are accustomed to testing an idea and failing. Artists go beyond pure tolerance and rather embrace ambiguity, as this allows them to step back and make connections between ideas.

These above-mentioned characteristics can be crucial along the entire knowledge flow. In fact, they allow not only to define and rethink research questions, but also to reflect on how to valorise and convey knowledge. Formulating the right research questions is the first step for impactful valorisation, as better concepts conceived thanks to creative and divergent thinking will create more potential for valorisation itself. In fact, thanks to art thinking, researchers can more easily anchor the research questions in a variety of societal topics and thus bring research questions closer to society, making the valorisation and exploitation process more impactful.

Box 8 : An example of art thinking process

Ars Electronica Futurelab's Art Thinking programme and school: at Ars Electronica Futurelab, Art Thinking experts design programs to meet the needs of various partners. The program generally consists of three phases: inspiring, envisioning, and prototyping. In the Inspiration phase, participants experience how to generate Creative Questions by experiencing a variety of artworks featured at the Ars Electronica Center and Ars Electronica Festival, and by participating in special workshops such as Art Thinking Card Workshop. In the Envision phase, the questions discovered in the inspiration phase are sublimated into missions for the partners and a concrete plan of action is developed to realise that missions. The goal of this phase is to conceptualise and sketch the future ideas. In the Prototype phase, that vision is embodied through research and development. The various Futurelab artists, researchers and partners collaborate to create a tangible future, and present it in public to gain feedback and generate social dialogue.

[21] J. Jacobs, Intersections in Design Thinking and Art Thinking: Towards Interdisciplinary Innovation, Creativity, Vol. 5, Issue 1, 2018.

[22] Embedded knowledge refers to the knowledge that is locked in processes, products, culture, routines, artifacts, or structures.

The art, science, and techniques of reframing in psychiatric mental health nursing: artists, together with health practitioners and scientists, can effectively contribute to 'reframe', which is a powerful psychotherapeutic intervention. Changing the "frame" in which a person perceives events can change the meaning the person associates with the events.

Sources: Art Thinking – Ars Electronica Futurelab and The art, science, and techniques of reframing in psychiatric mental health nursing - PubMed (nih.gov).

When applied to a research and valorisation context, artistic skills can result in the development of **arts-based methods and artworks**. Together, they tend to develop what in the literature is referred to as 'new ways of sensing'. In other words, they have the unique ability to create conditions for knowing, experiencing and strengthening relationships with the world through signs, forms, actions and objects.

Arts-based methods are often the expression used by researchers to refer to so-called unconventional and alternative **research methods**. The goal of, and benefit deriving from, the adoption of such approaches is to **engage understanding in a more multisensory, bodily, and experiential manner**. Arts-based methods for research purposes are increasingly becoming an important tool for critiquing traditions of, and discussing power structures within, academia, as it employs a different approach to what knowledge is, how and when knowledge is created, and who is a part of knowledge-creation.[23]

Today, arts-based research is evolving to encompass a broader conceptual foundation and is defined as "*research that uses the arts, in the broadest sense, to explore, understand, represent and even challenge human action and experience*".[24]

One of the main reasons why researchers select arts-based approaches for engaging the public with research, both in creation and valorisation phase, is the desire to find more effective ways of engaging stakeholders than can be achieved by using traditional research outputs (e.g. disseminating information through journal articles). This is particularly relevant when a broad and diverse audience needs to be engaged on complex or sensitive topics, or when specific communities who may not find traditional research outputs accessible need to be reached.[25]

[23] U. A. Seregina, Co-creating bodily, interactive, and reflexive knowledge through art-based research, Consumption Markets & Culture Volume 23, 2020 - Issue 6.

[24] Vv. Aa., *ARTS-BASED METHODS IN SOCIALLY ENGAGED RESEARCH PRACTICE: A CLASSIFICATION FRAMEWORK*, Art/Research International: A Transdisciplinary Journal, Volume 2 Issue 2.

[25] S. Ball and others, *Arts-based approaches to public engagement with research*, 2021.

Box 9 : An example of arts-based method

Artist-led building: farming organic knowing: this example presents a collaboration between an ethnographer and two artists, developed during a one-week residency at Kultivator, which is an artist-led project situated on an organic farm on the Swedish island of Öland. Kultivator is doing organic farming and building a farm to *think-with organically*. The research contributes an experiential account of artist-led practice in a rural context. Rather than focusing on artworks, this collaboration asks us to consider the way we 'build' our participatory process of living together and the role that artistic knowledge can have in doing so.

Source: Artist-led buildiSng: farming organic knowing: Journal of Visual Art Practice: Vol 19, No 4 (tandfonline.com).

At the same time, **artworks** are able to visually involve effective and experiential aspects, thus engaging people 'bodily'. In other words, works of art have the unique power to stimulate perception and experience rather than intellectual activity alone. Artworks are active mediators and intermediaries, thanks to which the experience is transformed into knowledge. Artworks and object-oriented artistic practices are an example of how knowledge can be produced through experience, rather than simply replicated. This is particularly relevant when the object-oriented artistic practice is the result of a transdisciplinary research process or has at its base a knowledge that is the result of a research process in disciplinary domains other than the artistic one.

In this context, an important role is played by cultural organisations, where visitors can shape their encounter with artworks thanks to the presence of those who are co-present in the space.

Box 10 : An example of artworks

'Trust me, I am an artist': the project Trust Me, I'm an Artist - Developing Ethical Frameworks for Artists, Cultural Institutions and Audiences Engaged in the Challenges of Creating and Experiencing New Art Forms in Biotechnology and Biomedicine in Europe has propagated innovative artistic production in biotechnology and biomedicine. All artworks produced deal with and incorporate scientific findings and knowledge, laboratory techniques and their meanings, reflection on and elements of ethical complexities as found in bio sciences research. These works are presented via the innovative format of Trust me, I'm an artist where an ethical evaluation panel consisting of ethical and artistic experts assesses and judges the artwork, its meaning and possible ethical implications as if it were research in biotechnology and biomedicine. The way these artworks investigate the ethical complexities in biotechnology and biomedicine and the way these artworks have been presented to both a professional and generally informed audience has strongly contributed to the skills to better understand ethics of techno-sciences research such

as clinical experiments, welfare of test animals, patient data protection, the understanding of ecological and human risk of biotechnologies and the understanding of the way ethics evaluation panels work in science.

Source: Search | Culture and Creativity (europa.eu).

The unique set of competencies (artistic skills, art thinking, arts-based methods and artworks) can be found both in artists and creatives who work individually and within cultural and creative organisations and organisations of various nature. The latter act as an important exchange platform where it is possible to implement open-ended processes of creation and valorisation.

2.5. CONCLUSIONS

Building further on these findings, one of the main conclusions is that, regardless of which actors are involved, in order to generate a significant impact on society and push the uptake of research-results and innovation, **knowledge valorisation should be conceived as a circular and transversal process**, starting immediately from the definition of the research questions. This process is, ideally, collaborative and involves the target users or civil society (the 'valorisation targets') from the initial phase.

Individuals and organisations from civil society need to be able to generate and exploit knowledge to develop new thinking and mindsets as well as practical solutions to approach and address complex societal challenges. In order to do so, it is needed to **better bridge the gap between production and valorisation**. This concept forms the backbone of the most innovative co-creation and valorisation practices, as well as of several national innovation policies. When conceived as an inter-twined process, production and valorisation follow an interactive and transdisciplinary path, in which knowledge is actively constructed by different actors, and not merely absorbed by them at the end of the process.

Knowledge valorisation occurs through the interaction of multiple actors along the entire knowledge flow. Literature gives empirical proof that **goals and actions about co-production and valorisation of knowledge for innovation, ideally are formulated and supported collaboratively to maximise the impact of the knowledge produced on target groups or civil society in general**.[26]

[26] F. Geerling Eiff and others, *Triple helix networks matching knowledge demand and supply in seven Dutch horticulture Greenport regions*, Studies in Agricultural Economics 119 (2017) 34-40; Värmland County Administrative Board, A Quadruple Helix guide for innovations, 2018.

Collaborating with societal actors and engaging with them in research production and valorisation can serve to legitimise research trajectories and produce more sustainable innovations by re-orienting research and development towards pressing societal issues.

The arts and cultural organisations are one of the possible actors to implement the circular and transversal concept of impactful valorisation. Fostering knowledge valorisation with the arts can happen during all phases of the knowledge chain or knowledge flow – from formulating the right research questions through communicating about new research results or innovations, to transforming data and research results into sustainable products and solutions that benefit society. See examples below:

- When involved in the creation phase, arts and cultural organisations increase critical, speculative and creative thinking. Formulating the right research questions is the first step for impactful valorisation, as concepts that are better conceived thanks to creative and divergent thinking can create more potential for valorisation. A very important benefit of working with artists and cultural organisations in knowledge networks is that they enhance the capability of thinking holistically and speculatively about complex societal issues and constructs, rather than from a (often very specialised) scientific/technological angle. Industry and research benefit from artists'/cultural organisations' involvement to address questions that are not yet thought of and addressed.
    - Arts-driven approaches makes it possible to **develop new ideas** and to **challenge research questions**, thus leading to the identification of new or revised ones. Researchers in domains other than the arts are in fact those dealing with hypotheses, knowledge findings and experiments. They are often limited by the very specific research focus they have or scientific discipline they are working in. On the contrary, the experimental and research approach of artists is much more open ended, as they do not have the limitation of verifying hypothesis and freely can experiment. We observe that the involvement of artists and the arts-based approach adopted by organisations allows scientists to broaden their scope outside the usual hypothesis setting and define research methods and questions that are more impactful for society. By allowing for a better understanding of which research questions and expected results are more relevant for society at large, artists and the arts help fill the gap between the practical knowledge of day-to-day life and the knowledge from research.[27]
    - Arts and cultural organisations provide a **space to connect and discuss speculative ideas on future scenarios**, addressing big societal/ethical questions (e.g., on AI, biases, gender dimensions, etc.), usually not

[27] https://ars.electronica.art/aeblog/en/2021/09/29/where-science-meets-society/

included in research practices. They can bring up these questions allowing citizens and the industry to understand the issues and the research behind, and be instrumental in the further public debate about it and incorporation of insights from this debate in research. These learning and capacity building processes are crucial if research aims to have an impact on society. Civil society and the industry can also take an active role in this speculative discussion and contribute to the definition of the 'right' questions on big societal issues as well as to the reflections on the impact through speculative future scenarios. To a large extent these are still unknown.

- Help connect with society in a more impactful way and spur research uptake. Arts and cultural organisations:
    - **translate science and technologies into stories** and participatory processes of understanding and, as such, contribute to building the meaning of, and trust in, as well as critical reflection on them in society. Artists are able to create the stories and the images that society needs to foster an understanding of what science and technology mean to society. This is one of the very promising and interesting aspects of the encounter between art and science, namely, to create messages that are telling us how science and technology are changing our lives from an arts perspective (shedding light on both the opportunities and the possible caveats/dangers/ethical consequences, etc.);
    - **awake interest and create a mental and emotional connection to scientific knowledge** (often very complex), as an incentive to deal with the many difficult issues facing our society today, thus **building a bridge** that enables an encounter with science. When this bridge includes a participatory engaging process, the expected impact is higher;
    - **spur research uptake and use**. Researchers (and research funders) are increasingly interested in supporting effective and impactful ways to stimulate the uptake of research findings and develop solutions. As elaborated above, in addition to increasing the public understanding of research and the relevance and impact of research on society, arts-based methods can also effectively build an **enabling environment for research uptake and use**. Creative spaces, such as hubs and labs, are the privileged place to **'push' research results to end users** and, vice versa, to strengthen the **'pull' from end users towards researchers**. In fact, these spaces enable end users to critically engage with research and search for solutions themselves;
    - by working together with industry and research organisations, understand what are the **cutting-edge topics/trends that need to be discussed** at societal level. This leads to the transformation of the artistic outputs.

Box 11 : Participants' motivations for transdisciplinary collaboration with the arts

Motivation for technologists and scientists:

- Emotionality – the artistic process can help push companies and organisations towards developing products and services that emphasise shared societal bonds.
- Exploration – engaging artists is not about discovering solutions but discovering needs as they add thinking about the consequences of technology to the process.
- Testing – artists can act as lead users of new technologies, critically testing them in non-conventional settings.

Motivation for artists:

- Role – these sorts of collaborations allow artists to directly shape its continued reconstruction, deepening their role in public and private life.
- Bridge – integrating artists into collaborative projects with scientists and technologists challenges them to develop skills to constructively integrate their thinking into developments, thereby benefitting their personal artistic practices and augmenting their potential for continued work with collaborators.
- Inspiration - science and technology are also a source of inspiration for artists and the development of their artistic practice.

Source: IDEA Consult, adapted from S+T+ARTS Collaboration toolkit, 2020

3. OBSTACLES AND ENABLING CONDITIONS

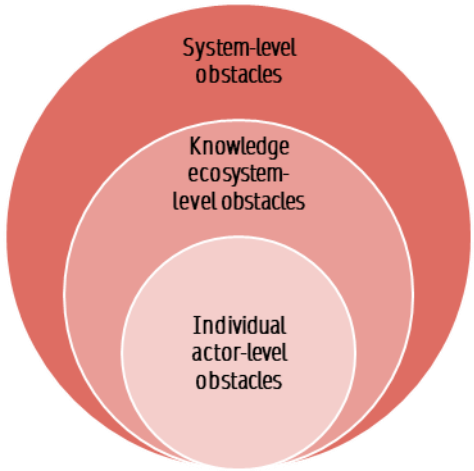
3.1. OBSTACLES

In the previous chapter we examined the collaboration models and participation mechanisms through which arts and cultural professionals and organisations take part throughout the knowledge creation chain, with a particular focus on fostering knowledge valorisation. We then presented what is the unique set of characteristics that these actors bring in.

However, looking at current R&I practices, such multi-actor collaborations with the arts are still far from being mainstreamed. In the following paragraphs we specifically analyse the question '**what prevents artists and cultural organisations from fully participating in knowledge creation and valorisation processes?**'

Based on the literature review, but above all on the inputs received from the interviewees, we have identified the main **barriers at system, knowledge ecosystem and individual actor levels**.

Figure 4 : Obstacles preventing artists and cultural organisations from fully participating in knowledge creation and valorisation processes



Source: IDEA Consult

SYSTEM LEVEL OBSTACLES

The first category of obstacles includes all those that originate at the level of the macro R&I ecosystem. They relate to structural challenges about policy, governance and funding and include:

- **Policy silos**: one of the main barriers preventing the arts from fully taking part in knowledge creation and valorisation processes and, in general, hindering the establishment of transdisciplinary practices, is silo-thinking at the level of policy making and the level of the different stakeholder groups. Although remarkable initiatives both at EU and Member State level have been launched to increment inter-departmental dialogue, policy departments still tend to work in silos when designing policy and funding programmes. Silos often persist due to a lack of awareness not only of other policy domains and the possible interconnections with them, but also of the benefits and impact that cross-domain collaborations can generate.

  Policy and funding programmes without a holistic view are the result of this lack of stable and continuous cooperation between policy domains. Transdisciplinary practices and mindsets at the level of the knowledge actors require transdisciplinary practices and mindsets at policy level to flourish.

- **Lack of awareness and consequent imbalance at Member State level**: while at the EU policy level mindsets are shifting and awareness is changing, at the national level both the interviewees and the literature point out that there is a strong imbalance and that some Member States still lag far behind, in terms of awareness of the importance of looking at knowledge creation and valorisation processes and, in general at R&I, with a holistic perspective. This directly affects the (lack of) multi-actor collaborations that policy makers stimulate via strategies and policy programmes.

  As an example, we record a lower number of multi-actor co-creation and valorisation practices in Eastern European countries. This is due to the fact that their R&I policy ecosystems are not as developed and innovative as those of Western and Northern European countries.[28] Nevertheless, also at the national/regional level things are advancing in some countries, especially at regional and city level: countries such as Croatia, Poland, Slovenia etc. are picking up fast and learning from the practices that have already been established in other countries. In Southern Europe, the situation is evolving too, with some countries (such as Italy) and especially specific regions, experiencing strong growth in this sense. A relevant example comes from the Emilia Romagna region (Italy) where the policy focus is on interdisciplinarity and strong involvement of arts and cultural actors in the regional innovation ecosystem.[29] Another example comes from the INTERREG project Smart Specialisation Creative Districts,

[28] Europees innovatiescorebord | Europese Commissie (europa.eu).
[29] Informal exchange with regional policy makers on regional strategies.

where six European regions developed policies to integrate arts and cultural actors in their local innovation ecosystems and increase cross-collaboration and cross-fertilisation initiatives between CCSI and other sectors of economy, education and research to drive innovation.[30]

- **Limitation of valorisation policies**: the concept of knowledge valorisation is still mainly connected to technology transfer and exploitation.[31] The concept is in fact underpinned by an implicit bias in favour of the hard sciences.[32] Although efforts are being done at EU level and by some Member States to reverse this trend, the idea of progress and innovation is still firmly rooted on technological advances based on new ideas, products and processes and research's value is increasingly understood in terms of its immediate contributions to economic growth, both at EU and MS level (with imbalances between MS). Therefore, it seems hard to see a place for arts and humanities research in this discourse. Traditional transfer outputs (e.g., spin-off companies, patents, licenses, etc.) and their measurement indicators fail to capture the true "breadth of humanities' research societal contributions".
- As a direct consequence of the above-mentioned obstacles, the **lack of adequate (long-term) funding is another barrier**. Both at EU and Member State level, it is rare that programmes fostering interdisciplinarity are inserted within a long-term established policy framework: they are often one-off initiatives or calls, whose renewal depends on political and budget priorities. This overarching framework should be built at the inter-departmental level, bringing R&I, industrial, cultural and education policies together.

  When it comes to reflecting on how specific funding programmes should be structured, there are several positions: we observe that usually funding opportunities for transdisciplinary collaborations originate either from research & innovation policy or from the cultural policy field, and as such often suffer from a **traditional unidimensional perspective** on the subject (either too focused on traditional R&D policy objectives and actors, or too focused on artistic/cultural policy objectives).

  Moreover, they often tend to **prioritise experimental practices to reach a specific objective (solution-oriented programmes).** This is not in itself an obstacle if counterbalanced by the presence of open experimentation programmes. Creation and valorisation processes involving different actors (including arts and cultural organisations), often have a back-and-forth nature and diverge from traditional management processes (that are instead based on the achievement of milestones).

[30] CREADIS3 | Interreg Europe.
[31] P. Benneworth, Tracing how arts and humanities research translates, circulates and consolidates in society. How have scholars been reacting to diverse impact and public value agendas?, Arts & Humanities in Higher Education 2015, Vol. 14(1) 45–60. This considerations has also been shared by the experts interviewed in the context of this study.
[32] "Hard sciences are all those branches of science in which facts and theories can be firmly and exactly measured, tested, or proved" (source: https://dictionary.cambridge.org/dictionary/english/hard-science).

According to interviewees, at the moment **policy programmes at national level supporting this open experimentation are still rare** and confined to some sporadic policy experiments or very cutting-edge policy contexts.

Some examples of targeted funding programmes are PEEK – programme for Arts-based Research provided by the Austrian Science Fund, and RESEARCH–CREATE–INNOVATE, a Greek state aid Action.[33] PEEK is open to any person engaged in arts-based research who has the necessary qualifications and whose main aims are to support high quality and innovative arts-based research in which artistic practice is integral to the research question and to increase both public awareness and awareness within the academic and the arts communities of arts-based research and its potential applications. The Greek case RESEARCH-CREATE-INNOVATE has a strong focus on the creative sector and aims to increase business initiatives and partnerships to support economic growth based on knowledge, by increasing research-related jobs and integrating new knowledge and innovation.

- When looking at cross-country and especially cross-regional collaboration, designing effective policies to support the creation of local and (inter)regional multi-actor knowledge ecosystems is still very challenging. The involvement and engagement of regional anchors and their connection across Europe still needs mediation and facilitation to take place. There are various initiatives across Europe facilitating the interrelation (and sometimes even creation from scratch) of regional and local knowledge ecosystems (e.g., S+T+ARTS, EDIHs, EER). Networking, exchange of best practices, capacity building and collaboration are necessary starting points to strengthen local policy contexts and knowledge ecosystems.
- **Lack of impact assessment evidence and mindset**: the added value of the arts in knowledge valorisation processes is a soft value, which is often difficult to measure in terms of impact. At the moment, there is a general lack of evidence and (widely accepted) measurement framework to assess the impact generated by the arts and cultural organisations on creation and valorisation processes and therefore on society as a whole. This lack is due to both the scarce focus on the topic over time and the fact that traditional impact assessment frameworks are not pertinent when working at the intersection of arts and science, as these latter frameworks are mainly based on economic parameters. An important challenge for policy makers is to stimulate and support impact assessment strategies and to build up evidence in a (scientifically sound) systemised manner about arts and culture's contribution in knowledge valorisation processes. This would be the key to showcase their value to researchers,

[33] https://www.fwf.ac.at/en/research-funding/fwf-programmes/peek and https://www.interregeurope.eu/policylearning/good-practices/item/3546/research-create-innovate-state-aid-action/.

industry, policy makers, etc. and how they can benefit from the involvement of arts and cultural organisations.

While investment in R&D is well described and monitored, at Member State level the public support to knowledge transfer and valorisation is less defined and traceable in terms of investment and impact. This may be largely due to the complexity of the process of turning research results into tangible societal and economic benefits. This is the subject of interventions of different national Ministries and organisations, shared competences between national and regional levels, a combination of horizontal general measures and more thematic or sectors-specific schemes.

- **Lack of a shared database for art-science resources at EU level**: this challenge pairs with the lack of impact assessment frameworks. Currently, insights from the numerous projects and initiatives already implemented at the crossroad between arts-science-industry-civil society are only available in a very fragmented manner. There is no repository at EU level where the results of those projects and available data on their outcomes and impacts, as well as existing resources and literature, can be consulted. This not only hinders the ability to easily show evidence to other knowledge actors (especially less convinced ones), but also increases the fragmentation of the sector and puts a strain on the sustainability of the practices themselves. A positive example in this sense is the repository from the Society for Artistic Research, a non-commercial, collaboration and publishing platform for artistic research. The repository is free to use for artists and researchers. It serves also as a backbone for teaching purposes, student assessment, peer review workflows and research funding administration. It strives to be an open space for experimentation and exchange.

KNOWLEDGE ECOSYSTEM LEVEL OBSTACLES

The second category of obstacles entails all those factors that are internal to knowledge ecosystems and refer specifically to the system of relationships between ecosystem actors. The main challenge is represented by the fact that **different 'languages' are spoken at ecosystem level**. Academic and independent researchers, industrial stakeholders, artistic actors and citizens tend not to understand the others' way of doing, thinking and speaking. This is not in itself a negative aspect per se, as long as there is openness, awareness and willingness to cooperate, and as long as there are intermediaries playing the role of mediator. However, if these three conditions are not present, speaking different languages can represent the cause of a series of resulting obstacles that hinder collaboration, namely:

- **Silo-mindset of knowledge ecosystem actors**: one of the main barriers preventing the arts from fully taking part in the processes that happen in the knowledge chain is silo-thinking among the different actors. As highlighted above, it is still difficult to convince the main stakeholders in the knowledge ecosystem (researchers, industry and policy makers) of the importance of thinking collaboratively with arts and cultural actors. Silo-thinking is as much linked to the individual and institutional mindset as it is to a

series of practical barriers that prevent stakeholders from acting collaboratively (e.g., the evaluation criteria being used in individual silos not stimulating transdisciplinary collaborations). This attitude inevitably reflects the choice of activating 'external partners' (i.e., those stakeholders who are not part of the knowledge ecosystem and who are still perceived as 'unusual') or not,. However, at the same time, artists and cultural organisations also have to bring convincing arguments first-hand to make other knowledge actors understand the value that they (can) bring to research and innovation. Overcoming this obstacle requires sound capacity building and targeted intermediation actions.

    - Sporadic project-based involvement of the 'unusual actors': as a consequence of the silo-thinking, the participation of the arts in knowledge co-creation and valorisation processes is still very much project-based, exploratory and experimental. In other words, it is mainly activated when it is thought that a project needs 'unconventional' partners to bring research messages to society. Their involvement in knowledge chains is far from mainstream. This bring us to the conclusion that artists and cultural organisations are not perceived as a potential partner that is structurally part of the knowledge ecosystem. Most of the practices screened show that the dominant view on artists and cultural organisations in knowledge systems is still that of actors to bring into the knowledge arena 'from the outside' with the focus on dissemination of already existing research outcomes. The idea of systematically working together with an artist or a cultural organisation is not yet part of the thinking, let alone of the (funding and support) systems in place.

- **Lack of platforms to connect and make fortuitous encounters**: although several sectoral networks and project communities exist both at EU and especially at national level, there is still a lack of physical and virtual platforms for (fortuitous) encounters between different actors (such platforms in fact mainly exist at the level of individual actors). Nevertheless, these platforms are vital to allow non-usual-suspect actors to meet and start collaborations. These platforms are often linked to one or more intermediary actors facilitating collaboration, by creating and nurturing networks, and by conducting and supporting activities that close the gap between the arts, science and industry.
- **Lack of an evaluation culture**: when multi-actor creation and valorisation (long-term or short-term) activities take place, there is often little focus on highlighting the main impact of such collaboration, as well as the challenges and the mistakes to learn from, unless specifically required by the project itself. This is even more relevant when the activity has an experiential nature (like valorisation processes) and does not lead to the production of a well-defined tangible output. Disseminating results and outputs of multi-actor collaborations may not be enough and the absence of evaluation and impact frameworks hampers the 'mainstreaming' of such practices at ecosystem level. At the

same time these would in fact help build legacy to advocate towards policy makers and increase the awareness of all ecosystem actors. Evaluations and (even more) impact assessments are vital to understanding what difference the transdisciplinary nature of the activity has made and thus what effects were had on the target groups. This would be the key to showcase their value to researchers, industry, policy makers, etc. and how they can benefit from the involvement of arts and cultural organisations.

- Often the **knowledge ecosystem actors lack capacity and skills to activate processes of valorisation** that see the stipulation of collaborations and the engagement of the civil society. This is valid both within the arts and cultural organisations, as well as in the world of research and industry. It relates not only to a lack of dedicated financial resources, but also of mindset and skills. At the level of the single knowledge actors, there are professionals who are used to working in a collaborative way due to their personal inclination and others who lack either the skills or the mindset to do so.

INDIVIDUAL ACTOR LEVEL OBSTACLES

We examine the barriers at the level of the single main actors within knowledge ecosystems (excluding policy makers, who were addressed in the section on system-level obstacles). Results are indicated as follows per actor type:

Universities, Research Institutes and Industry

Even though several incentives are increasingly implemented in the research (and especially academic and industrial) environment, knowledge **valorisation strategies are still very much focused on incentives for economic outputs**. Moreover, it remains unclear how research institutes (and especially universities) and industrial actors configure incentives for a broad societal impact of knowledge. Insights on incentives and strategies to foster societal impact are still few. Since knowledge valorisation encompasses many different dimensions, a single focus on the economic dimension neglects other important impacts of research, such as the generation of societal impact on civil society and research target groups.

Regardless of the broad nature of valorisation activities and despite any best efforts to improve their accompanying processes, **the active engagement of researchers (especially in academic contexts) and industrial actors in these processes continues to be a limiting factor**.[34] The initiation of tailored valorisation processes, and the involvement of various actors in them, highly depends on the personal commitment of the individual researcher or R&D department, as it is not (yet) an institutionalised practice (especially in academia). This is due to various factors:

[34] Linda H. M. van de Burgwal, Ana Dias & Eric Claassen, *Incentives for knowledge valorisation: a European benchmark*, The Journal of Technology Transfer volume 44, pages1–20 (2019).

- As for researchers, as explained above, the **lack of a valorisation framework and incentives** often makes it difficult for researchers to justify the investment in working hours dedicated to valorisation and dissemination, as, from a formal point of view, these are not connected to any of their 'core' activities (research, publishing, teaching). However, some researcher grants exist in which cross-domain and cross-sector collaboration is an explicit criterium for funding, thus allowing them to formally incorporate cross-collaboration and valorisation in their work from the very beginning.
- More broadly, many researchers, academics and industrial actors are still **reluctant to engage** in knowledge valorisation and this may be exacerbated by both the lack of valorisation incentives that affect the responsiveness of the reluctant actors and by a too narrow definition of research value and impact on society. Many perceive this as too time consuming and an unhelpful addition to research commitments.
- Finally, as mentioned above, researchers and industrial actors are often not trained to work collaboratively with partners that do not belong to the usual suspects for knowledge valorisation purposes – let alone with arts and cultural actors.
- In academia, valorisation of academic research results often happen in peer networks (through publication of articles, conference proceedings, etc), thus contributing to increased silos.

Artists and Cultural Organisations

Arts and cultural organisations themselves sometimes **lack awareness and openness** as well. Within the cultural and creative sector, there is reluctance towards the involvement of the arts in knowledge valorisation processes. While there is generally consensus among organisations due to their innate social mission, artists have various positions. Those against have built their careers on the notion of complete artistic freedom meaning that, although collaborating at times with non-creative partners, they reject any type of co-creation and involvement of any third party in their process and projects. At the same time, a considerable number of artists nowadays are very open toward transdisciplinary hybrid practices and collaborations.

The **fear of being instrumentalised** often prevents transdisciplinary collaborations. This often happens because the artist or the organisation perceive that they are considered as 'suppliers', rather than partners. While for some this is not an obstacle and it is fine to contribute and not co-participate, there are others in the sector for whom it remains an issue. Therefore, it is necessary to clarify from the start the nature and objectives of the collaboration and ensure that all partners in the collaboration are met on their terms.

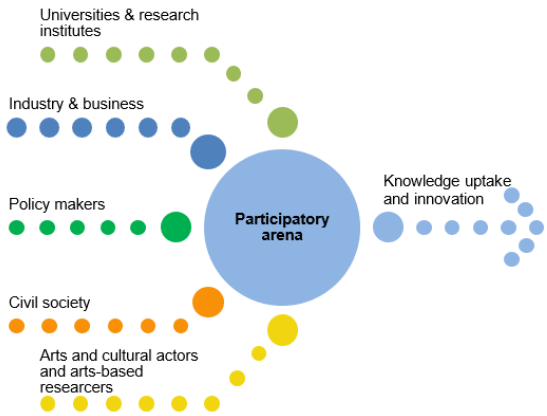
3.2. ENABLING CONDITIONS

The analysis of obstacles hindering collaboration at macro- and micro-ecosystem level, along with the overall investigation, leads to the identification of a number of **enabling conditions necessary for arts and cultural organisations to play a role in the knowledge ecosystem and for other actors to be able to collaborate with arts partners**.

We consider the recognition of the arts and cultural actors as a distinctive source of knowledge and innovation at the system level as a pre-condition. Although progress is being made in this direction, the indispensable role that the arts and cultural organisations play in knowledge ecosystems is underestimated or even not considered. This requires a change in frameworks and perspectives at policy level, in terms of policy agenda and budget, as well as within the science and business innovation fields. The arts need to be considered and treated as part of the knowledge system in this general structure. If this first condition is ensured, then it will be easier for individual knowledge players and institutions to play their roles and start collaborations.

Taking into account the unique characteristics that arts and cultural actors bring in R&I processes, we would state that they actually should represent a **separate helix** in the model developed by Carayannis and Campbell (see chapter 2), rather than being merged with civil society in the fourth helix.

Figure 5 : Arts & cultural actors and arts-based researchers as a separate helix in innovation ecosystems

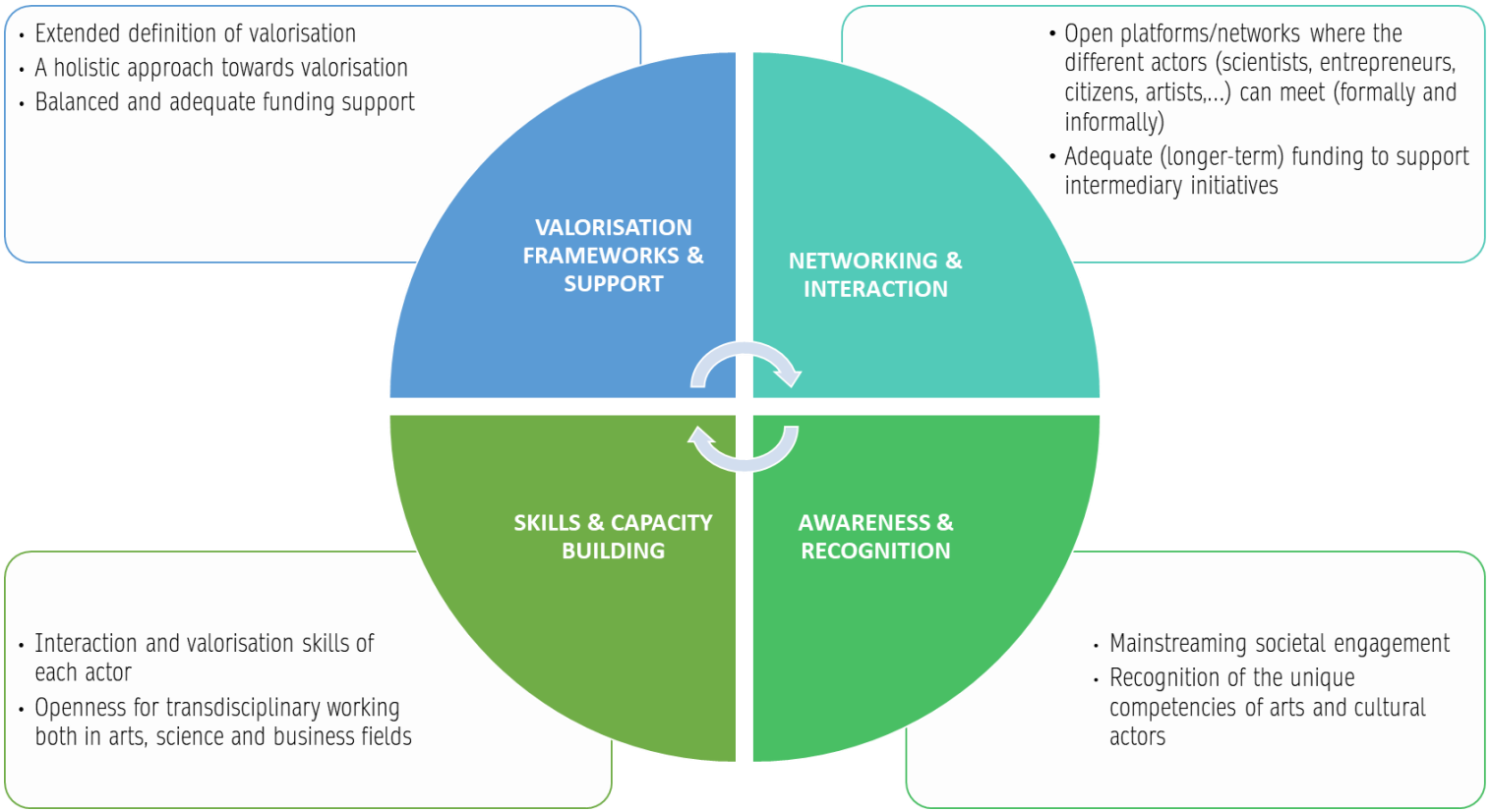


Source: IDEA Consult, adapted from the framework developed by Carayannis and Campbell, 2014

We cluster the enabling conditions into four pillars:

- Awareness & recognition
- Networking & interaction
- Valorisation frameworks & support
- Skills & capacity building.

Figure 6 : Enabling conditions for a full participation of arts and cultural organisations in knowledge creation and valorisation processes



Source: IDEA Consult

VALORISATION FRAMEWORKS & SUPPORT

- **An extended definition of valorisation**: going beyond a concept of valorisation as pure technology transfer and, in general, commercialisation of research results for economic purposes is the first system-level condition for trans- and interdisciplinary knowledge creation and valorisation practices and consequently for an effective generation of societal value. This implies looking at research exploitation including innovations that are not just based on intellectual property and can have not-for-profit applications, along with commercial ones. As pointed out in literature and policy documents, the nature and value of arts and humanities goes beyond financial value, playing a key role in the transmission of culture, practices, meaning and values, and contributing to inclusive societies.

  Expanding the definition of valorisation also implies the recognition of informal collaborations. This refers to acknowledging that valorisation also goes through everyday informal and relationships-based interactions and to accepting that this is more difficult to quantify than IP-based forms of exchange.

- **A holistic approach towards valorisation**: knowledge valorisation should be conceived as a circular and transversal process, implemented throughout the knowledge creation flow and starting right from the definition of the research questions. This process should be collaborative and involve the final target users (civil society or specific groups) from the production phase.
- **Balanced and adequate funding opportunities**: funding programmes, both at EU and national level, ideally are not limited to supporting experimental practices, but should also support the development of long-term visions and a diversity of collaborations with the arts. This requires a balanced plethora of funding opportunities including both seed, challenge-led and project-based funding, as well as for more structural and long-term opportunities. These programmes also take into account the specificities of the arts and cultural professionals and ensure flexibility.

AWARENESS & RECOGNITION

- **Mainstreaming societal engagement**: as a consequence of the adoption of a wider concept of valorisation and the acknowledgement of the diversity between and within actors, a trustful and open environment where societal actors cooperate with the research community is an essential condition to foster research uptake and increase impact on society.
- **Recognition of the unique competencies of arts and cultural actors** to connect with societal actors and to engage them in participatory long-term processes with other knowledge actors. The interest in the arts and culture as a bridge-builder and knowledge

disseminator has been growing in recent years at broad EU policy level. However, the idea that these actors can take part in longer-term engagement processes is not yet mainstreamed. We acknowledge that the involvement of arts and cultural organisations may not suit all research creation and valorisation processes. However, the recognition of their role is an essential condition to instil the idea (at ecosystem level) that the arts can (potentially) serve as a peer ally.

NETWORKING & INTERACTION

- The presence of **open (physical and virtual) platforms/spaces and networks at local/regional level** where the different actors (scientists, entrepreneurs, citizens, artists, etc.) can meet (formally and informally) and have opportunities for (spontaneous) encounters has been highlighted throughout this research as an essential format for the further uptake of arts-science-industry-citizen collaborations. These platforms are ideally created in quadruple (+ arts) helix settings and look into the barriers and enablers of co-creation and valorisation, thus helping bridge the gap between the various actors. Bridges can be built if cross-domain knowledge and perspectives are exchanged and discussed: this is the vital condition behind every creative collaboration.
- Platforms and networks facilitate open dialogue on how to co-develop innovative valorisation models by involving government, industry, civil society participants, academic partners and arts and cultural actors. Regardless of whether they are rooted in a regional, national or international context, these platforms are crucial partners, serving as catalysts for change at local level.
- **Adequate (longer-term) funding to support intermediary initiatives**. As previously discussed, and proven by the case studies developed, the role of mediators is crucial to both activate collaborations and make them successful. Incentivising, supporting and strengthening their role within the ecosystem is a relevant condition for ensuring a comprehensive and systemic approach to the uptake of research-based solutions.

SKILLS & CAPACITY BUILDING

- **Interaction and valorisation skills of each actor**. As mentioned above, quadruple helix actors and the arts are often not used to collaborate with each other for valorisation purposes. If they have not previously worked in this way, there will inevitably be a steep learning curve. Not only do they need to understand the ways the other actors work and ensure that partners feel valued, but they also have to be trained to develop or strengthen such interaction skills. In fact, while there are professionals with a more collaborative inclination, there are others who still need to be trained in doing so. What

emerges from the interviews is that, at least at the level of cultural organisations, the change is in motion and continuous training is underway.

- **Openness towards interdisciplinarity both in arts, science and business fields**. When you bring a researcher in the business environment, everybody expects to learn something, grow and change. The same should happen with artists (the artist can change the course of their business and research), but this is not the case at present. In order to make all actors step out of their comfort zone and seek a dialogue based on a common language, a more open mindset needs to be developed. To do so, targeted capacity building actions need to be developed. This can be reached by establishing platforms for exchange. It is only when all these actors interact that a common level of understanding can emerge.

Box 12: Key intermediary actors influencing the enabling conditions

- **R&I policy makers** (at all levels of governance, and in dialogue with other policy domains): implement R&I policy strategies and frameworks, facilitate structural valorisation pathways oriented towards societal value by implementing knowledge valorisation policies, design funding programmes and support knowledge/technology transfer primarily with the aim of economic impact (job creation, start-ups, etc.).
- **Universities and research institutes:** focused on conducting excellent (academic) research, teaching and targeted use and transfer of academic knowledge to help resolve diverse societal challenges (often oriented towards technology transfer). This is also reflected in Key Performance Indicators (KPIs) and evaluation criteria, although the 'universities' third mission' mostly receives less attention in this context.
- **Educational institutes and education policy** responsible for (lifelong) learning, capacity building and skills development.
- **Industrial platforms and cluster organisations** providing space for networking and collaboration among industry partners.
- **Representative networks of artists and cultural organisations**, advocating and lobbying for more recognition and exchanging in constructive dialogues with other quadruple helix actors.

All the above-mentioned actors within the knowledge ecosystem are responsible for activating themselves to partner and build cross-silo (formal or informal) long-term networks of collaboration across the 'quadruple+' helix.

Integrating the arts and cultural organisations in knowledge ecosystems across Europe requires a change of mindset and approach for all actors to tackle the existing multilevel obstacles. This is particularly relevant for local and regional ecosystems. The European Commission can be an important partner in making the change happen

by providing the right incentives for change, the right structures to connect all stakeholders, or by raising awareness about the positive contributions that the arts and cultural organisations can make for more impactful knowledge valorisation to the benefit of society. We further elaborate on these EC policy recommendations in the next chapter.

Source: IDEA Consult

4. RECOMMENDATIONS TOWARDS THE EUROPEAN COMMISSION

4.1. A POLICY TOOLKIT SUPPORTING SYSTEMIC CHANGE

The study has revealed some compelling evidence on the distinctive role(s) that arts and cultural organisations have in knowledge ecosystems, and on the benefits of such involvement that can make them particularly effective partners in achieving certain objectives set by the new ERA.

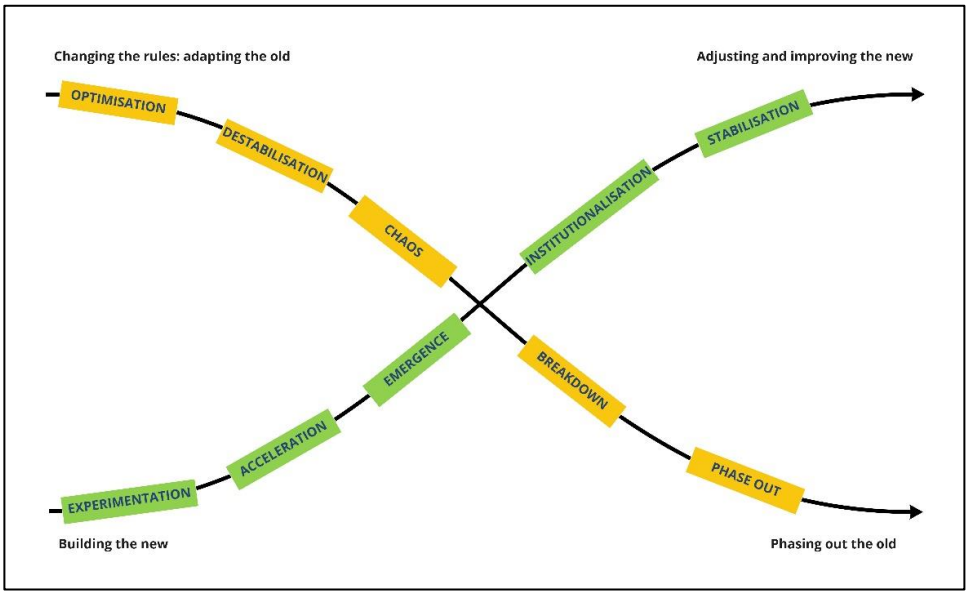
At the same time the study also points to barriers at individual, organisational and ecosystem level that prevent an effective participation of the arts in knowledge processes and impactful knowledge valorisation. Based on the analysis of barriers and enabling conditions, we can state that to fully tap into the potential of arts and cultural organisations in knowledge valorisation for the benefit of society, a systemic change is needed.

This means that:

- several current dominant perspectives and practices with respect to knowledge valorisation need to be complemented with new concepts and frameworks that much better recognise the distinctive role(s) that arts and cultural organisations play in the quadruple helix
- collaborations between arts and other knowledge actors need to outgrow the 'unusual collaborations' status and become more mainstream in our economy and society at large.

An interesting framework in that respect is the **x-curve of transition** (see figure 7) that illustrates how systemic change or transition is a process of fading out practices that are no longer considered sustainable (in this case for ensuring impactful knowledge valorisation for society), while at the same time developing and mainstreaming interesting experiments/new practices to become more impactful for society. **Such transitions take years to fully materialise and are the result of a co-evolution of multiple developments at different levels and involving many stakeholders.**

Figure 7 : The x-curve of transition



Source: IDEA Consult, based on Loorbach (2014)[35]

Driving systemic change is a complex process where a multitude of actors share the responsibility for taking actions to accelerate the transition in a desired direction, without this process being centrally orchestrated. At the end of the previous chapter, we highlight some of these main actors, such as R&I policy makers, universities and research institutes. However, it goes beyond the scope of this study to formulate recommendations for all these actors. In this study, we primarily focus on addressing the European Commission to maximally support this transition.

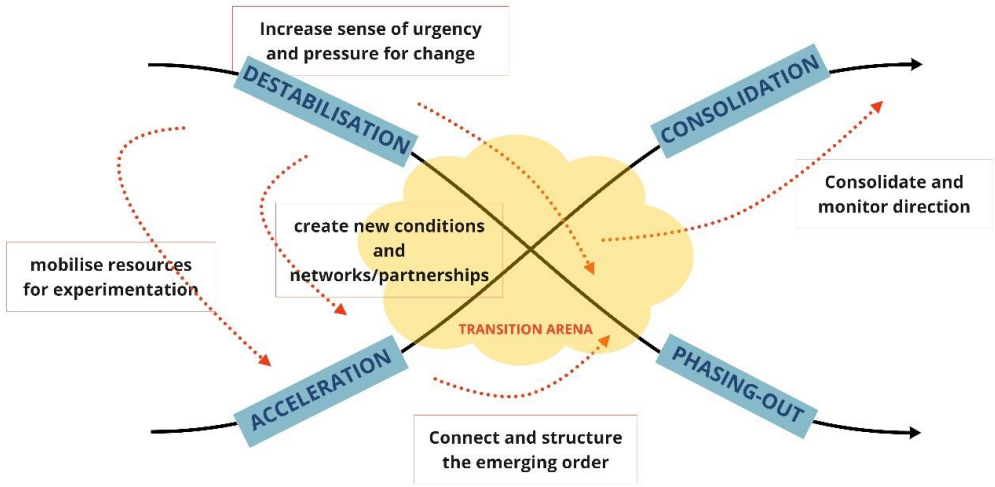
To structure these recommendations, we make use of the model developed by DRIFT[36] that provides a framework for reflecting on the set of policy instruments that can effectively guide transition processes. According to this model, an optimal policy toolkit to support transition ideally focuses on the following five elements (see Figure 8):

- Increasing sense of urgency and pressure for change
- Mobilising resources for experimentation
- Creating new conditions and networks
- Mainstreaming positive system changes by connecting and structuring new ecosystems

[35] Loonbach D., To Transition! Governance Panarchy in the new Transformation, 2014
[36] Dutch Research Institute for Transitions at Erasmus University Rotterdam in the Netherlands (https://drift.eur.nl/)

- Establishing and monitoring direction.

Figure 8 : A policy toolkit that guides transition



Source: based on DRIFT

We use this framework to take stock of how the current policy toolkit of the European Commission fosters the participation of arts and cultural organisations in knowledge valorisation processes, identify gaps and make recommendations for further improvements. These recommendations aim to advise on how European policy makers can take better account of the potential of arts and cultural organisations to promote innovation for the benefit of society. Lastly, they also aim to inform the collaboration with Member States and regions in this field.

Our recommendations build on the insights from the previous chapters and have also been fuelled by a focus group discussion on 25th January 2022 (see Annex 6.3). Moreover, they also build further on relevant policy documents that also investigate the topics under discussion in this study, namely the 2020 Communication on the new ERA, the 2018 OMC report on 'The roles of public policies in developing entrepreneurial and innovation potential of the cultural and creative sectors', the 2020 conclusions of the 'FLIPping the odds' conference in the context of the EU-funded project Creative FLIP and the recommendations developed in the framework of the H2020 project 'SHAPE-ID: Shaping Interdisciplinary Practices in Europe, as several of these recommendations also remain valid in the context of this study.

For each set of recommendations, we indicate the relevant policy tools for their implementation. As a general remark, we also stress the importance of the Commission

expert groups. Although they are not policy initiatives, they have an important advisory role. They can therefore be relevant forums for discussion on the issues touched upon in this study, as well as be relevant structures to connect multiple types of actors. The main expert groups we refer to are:

- the EU Community of Practice to co-create the Code of Practice for the smart use of Intellectual Property
- the Commission expert group on the ERA Forum
- the Commission expert group on the Economic and Societal Impact of Research and innovation
- the Horizon Europe Commission expert group on Partnership Knowledge Hub and Commission expert group on support for the strategic coordinating process for partnerships.

4.2. FURTHER INCREASE THE PRESSURE FOR CHANGE

Current dominant status

The fact that arts and cultural organisations can positively contribute to fostering knowledge valorisation and impact-oriented innovations is not yet fully reflected in strategic EU policy documents – the New European Bauhaus being a rare exception – let alone at national or regional level. Although this study is a clear indication of changing mindsets at the European level about the multidimensional potential of arts and cultural organisations in knowledge (valorisation) processes, this is not yet translated in key European documents that relate to both knowledge valorisation and knowledge ecosystems. The arts are often mentioned in a more limiting role than the multidimensional potential that we have observed in this study (e.g., only as diffuser of knowledge that is produced by others).

Moreover, mainstream concepts about R&I and knowledge ecosystems – such as the concept of the quadruple helix or of technology transfer – largely ignore the authentic role and unique competencies that arts and cultural organisations can bring in.

SPARKING CHANGE – EC POLICY RECOMMENDATIONS

Based on these findings, it is recommended that the European Commission further stimulates **awareness creation at the various levels of policy making** about the importance of user-driven and co-creative approaches for knowledge creation and of the relevance of involving the arts in strengthening the valorisation of knowledge coming from research. This should be better recognised at the different levels of innovation policy development (EU, national, regional, and local).

One way to do this is by leading by example. **Commit at the European level to a holistic and long-term policy vision and strategy** that promotes the integration of arts and culture in research and innovation policies and instruments:

- Systematically and explicitly include arts and cultural organisations as partners when talking about R&I and knowledge ecosystems.
- Repeatedly highlight in strategic communications and events (e.g., European Research and Innovation Days, European Knowledge Valorisation Week) the particular strengths and benefits of the arts in contributing to both the creation and valorisation of knowledge.

Relevant policy tools

A range of EU policy instruments and programmes are relevant to implement the recommendations provided. Some **priority actions** are listed in the box below.

<u>General working methods and policy instruments:</u>

- Commission (or Council) recommendations
- Studies and mapping exercises
- Council and Commission meetings with national ministers
- Conferences.

<u>Specific policy initiatives and programmes</u>

- New Industrial Strategy for a green and digital Europe
- The European Green Deal
- New European Bauhaus

- Horizon Europe, including the EIT KIC's (European Institute of Technology Knowledge and Innovation Community) and the new EIT KIC on CCSI (Cultural and Creative Sectors and Industries)
- European Research and Innovation Days (European Commission's annual flagship Research and Innovation event).

4.3. CREATE NEW CONDITIONS AND NETWORKS

Current dominant status

Based on the study, we conclude that only few policy instruments encourage and support multi-actor collaborations with arts and cultural organisations for knowledge valorisation. Most policy instruments either focus on arts and cultural actors (such as Creative Europe) or on the traditional triple helix R&I actors and networks (academia, scientific research institutes, industry), thus perpetuating existing silos. Support for transdisciplinary networks is rare.

At the policy level, the main advisory platforms on R&I and knowledge valorisation policies lack a representative voice from the arts, thus confirming the dominant knowledge ecosystem structures (primarily traditional triple helix partners). The same holds true for the policy domain of culture, where instruments for exchange such as Voices of Culture or the Open Method of Coordination (OMC) rarely cross the policy silos towards R&I policies.

This policy silo-thinking hinders collaborations fostering knowledge valorisation and is not only present at the EU level, but persists at all governance levels, although in some regions to a lesser extent at the local and regional level.

SPARKING CHANGE – EC POLICY RECOMMENDATIONS

Based on these findings, we recommend that the European Commission **supports the further development of platforms for transdisciplinary consultation and exchange** by**:**

- Installing a more **structured exchange** between policy makers active in R&I and knowledge valorisation policy with existing EU networks that focus on transdisciplinary collaborations with the arts (e.g., NEMO, ECHN, ECISTE, S+T+ARTS community). Enhance the role of these intermediary actors and better integrate them in wider consultations, communities of practice, expert groups, etc.

- Supporting the **set-up of platforms and forums** that connect arts and cultural actors, researchers, citizens, industrial actors and public sector bodies in order to develop collaboration projects.
- Supporting the **creation of a Community of Practice (CoP)** for sharing inspiring practices on fostering knowledge valorisation in collaboration with arts and cultural organisations. This can be achieved by organising ad-hoc workshops and consultations with the practitioners mentioned in this study, together with experts and academics. One of the actions to follow up in this CoP is the co-creation of guidelines and a code of practice on how to enable knowledge valorisation, together with sectoral stakeholders.
- Supporting exchange and **peer-learning among national and regional authorities** on effective policy design for the development of transdisciplinary networks representing the (quadruple + arts) helix at regional and national level. Existing instruments such as the Policy Support Facility or INTERREG can provide forums for such mutual learning and exchange.

Furthermore, the study highlights the importance of **taking away barriers in existing policy instruments for transdisciplinary networking and collaboration with the arts.** More specifically, we recommend the following actions:

- Screen the main existing R&I policy instruments and make them more inclusive for arts actors wherever relevant. This would help create an environment where artists and cultural organisations (structurally) can collaborate on a level-playing field with other sectors and are able to contribute to research and innovation.
- While making the portfolio of policy support instruments for R&I and knowledge valorisation more inclusive for arts and cultural actors, take into account the specific characteristics of actors in those sectors (micro-sized structures, freelancers, etc.). Ensure flexible application procedures and evaluation frameworks to accommodate 'non-standard' research partners. One example might be to introduce two-stage application procedures.
- Involve sectoral professionals and experts with a transdisciplinary mindset, citizens, and societal actors in designing funding programmes and calls (co-design of calls).

Bridge policy silos: identify mechanisms for exchange and cooperation across policy domains, to increase inter-service dialogue and a common understanding of the role of arts and cultural organisations in fostering knowledge valorisation. This is applicable to both the EU level (inter-dialogue between DGs) and Member State level (inter-services between ministries). The following actions can bring this forward:

- Pro-actively share the results of this study to draw the attention of other policy departments (e.g., those responsible for economic and social development) to the topics, and co-ordinate responses, strategies and (joint) actions.
- Systematically evaluate (existing) policy advisory platforms on their multi-stakeholder character and openness to arts actors. E.g., Include representatives from the arts and culture in Commission expert groups such as the Commission expert group on the ERA Forum or the Commission expert group on the Economic and Societal Impact of Research and Innovation.

Relevant policy tools

A range of EU policy initiatives and programmes are relevant to implement the recommendations provided. Some **priority actions** are listed in the box below.

<u>General working methods and policy instruments:</u>

- Peer-learning activities
- Open Method of Coordination working groups and expert groups with MS representatives
- Commission-led expert groups with MS representatives
- Inter-DG discussion groups
- Policy co-design
- Structured dialogues
- Stakeholder consultations
- Policy dialogue on knowledge valorisation with Member States.

<u>Specific policy initiatives and programmes</u>

- All EU funding programmes, with priority focus on Horizon Europe, including European Partnerships in Horizon Europe and the EIT KIC on CCSI
- New European Bauhaus
- INTERREG
- EU Knowledge Valorisation Platform

- Knowledge Exchange Platform (an important forum for dialogue with European regions and cities on issues related to research and innovation)
- JRC Policy Lab
- Policy Support Facility
- S3 Platform on Cultural and Creative Regional Ecosystems - CCRE-S3 partnership
- Voices of Culture, the structured dialogue between the European Commission and the cultural sector in the European Union.

4.4. CONTINUE MOBILISING RESOURCES FOR EXPERIMENTATION

Current dominant status

Existing policy instruments supporting the engagement of arts and cultural organisations in knowledge (valorisation) processes primarily focus on providing financial support for experimentation. For such a practice that is still far from mainstream, funding for experimentation is very important to create the necessary space for stakeholders to engage in this high-risk activity (in terms of unfamiliar working environment, uncertain outcomes, etc.), test and evaluate it, and draw lessons from it.

However, an important drawback of these funding programmes is the lack of financial support to cover costs for exploring and building collaborative partnerships, mediation and learning between partners, nor for structured reporting of the impact generated through the collaboration, the barriers that have been encountered or lessons learnt. The lack of funding for these activities perpetuates the fragmentation of results and lessons learnt and hinders the development of an evidence base on which more effective policy support frameworks can be designed to upscale these types of practices.

Furthermore, this study also underlines the crucial role that mediators play in facilitating and monitoring the process for these collaborations. However, very limited support is given to capacity building for mediators and the development of a pool of strong mediators that can take up this role.

SPARKING CHANGE – EC POLICY RECOMMENDATIONS

Based on the observations from the study, it is recommended to:

- Ensure that there is funding for experimentation with arts and cultural organisations for knowledge valorisation processes in all **scientific disciplines and types of innovations** (technological, social, etc.).
- Provide a **wide range of suitable funding instruments** that fit the needs and structures of the different types of actors (academia, large corporations, SMEs and microstructures, freelancers) and transdisciplinary collaborations, including seed funding for pilot experimental projects and challenge-oriented funding, including:
    - **Funding curiosity-led and experimental transdisciplinary research projects**: ensure adequate funding for curiosity-led, bottom-up collaborative research to stimulate new collaborations.
    - **Funding challenge-led research**: fund collaborative projects around specific challenges as a way to stimulate multi-actor collaborations.
    - Providing **microfunding** programmes and instruments (e.g., vouchers schemes) for small-scale experimentation.
    - Avoiding focus on funding project-based experimentation only, but also providing **funding for physical exchange platforms** that are especially important to enhance open-ended collaborations.
- Provide financial **support for investments in enabling conditions** (at project level, such as e.g., a network of mediators) that support longer-term impact of project-based experimentations.
- Incentivise all stakeholders involved in knowledge valorisation processes with arts and cultural organisations, to **accelerate (impact) reporting and the development of an evidence base** on the role(s) that arts and cultural organisations play in these processes**.**

Relevant policy tools

A range of EU policy initiatives and programmes are relevant to implement the recommendations provided. Some **priority actions** are listed in the box below.

General working methods and policy instruments:

- Peer-learning activities
- Open Method of Coordination working groups and expert groups with MS representatives
- Commission-led expert groups with MS representatives
- Inter-DG discussion groups
- Stakeholder consultations
- Studies and mapping exercises
- Specific policy initiatives and programmes
- Horizon Europe, including European Partnerships in Horizon Europe and the EIT KIC on CCSI
- New European Bauhaus
- Creative Europe
- INTERREG
- Erasmus+ Alliances (skills and capacity building).

4.5. FACILITATE THE MAINSTREAMING OF POSITIVE SYSTEM CHANGES

Current dominant status

We can observe a growing group of 'innovators' and 'early adopters' of arts-based collaborations benefitting innovation and knowledge valorisation processes across Europe. However, for most researchers and innovators, it is still very far from being a common practice to consider. To accelerate the mainstreaming of these practices, initiatives that inspire current non-users and can take away their doubts and questions are critical. Relevant instruments could be e.g., exchanges with current users, testimonies of users, verifiable evidence of the benefits, innovation contests or repositories with inspiring cases. The current EU Knowledge Valorisation Platform and its repository of practices can be a powerful tool in that respect. However, it currently has no focus on specifically showcasing and highlighting knowledge valorisation practices involving arts and/or cultural organisations.

At the same time, this study finds that also early adopters would benefit from being better connected, to share experiences and lessons learnt, to further expand the body of knowledge and expertise on this topic in Europe and overcome fragmentation of initiatives.

Now, such instruments and networks are largely missing at the European level. Support for capacity building to get the most out of these collaborations is currently underdeveloped.

SPARKING CHANGE – EC POLICY RECOMMENDATIONS

Based on the findings of this study, we recommend that the European Commission further develops the existing EU Knowledge Valorisation Platform and its repository of practices in such a way that it also allows to specifically put the spotlight on the role(s) that arts and cultural organisations (can) play in knowledge valorisation processes. More specifically, we recommend to:

- **learn from previous experiences** related to e.g., how citizens and their role in knowledge valorisation has been put to the fore in recent years: how was that implemented in communication strategies? What worked (and what not)
- build in the possibility of specifically searching for **knowledge valorisation practices involving arts/cultural organisations in the existing repository of practices**. The longlist of practices that has been developed in the context of this study can be a good starting point to feed into the repository
- use the moment of publication of this study to widely reach out to and start **building a wide network of 'interested learners' that are open for inspiration** on this topic
- **incentivise EU funded projects** in this area to provide content for sharing on the Knowledge Valorisation Platform and thus feed the repository by providing testimonies or other relevant communication. E.g., make it part of the criteria for funding.

Invest in lowering the barriers for participation in transdisciplinary collaborations with the arts by:

- integrating the findings of this study in the future guiding principles for knowledge valorisation and code of practice
- encouraging evidence creation: there is a need to produce evidence on the impact of arts-based co-creation and valorisation processes and their suitability for achieving important objectives set by the new ERA, among others. This includes the development of new tools to measure the progress and impact of multi-actor co-creation and valorisation practices, as well as the impact of intermediary organisations and networks in support of these practices. The European Commission is in a good position to undertake such a publicising role and promote impact assessment studies in this regard.

Mobilise **resources for capacity building** on the side of all partners involved in knowledge (valorisation) processes, including the arts and cultural organisations.

Recognise that the actors within knowledge ecosystems have low knowledge of the opportunities linked to interdisciplinarity and the involvement of the arts There is a need for appropriate long-term support to build capacity and enhance transdisciplinary competences for user-involvement on all levels.

Relevant policy tools

A range of EU policy initiatives and programmes are relevant to implement the recommendations provided. Some **priority actions** are listed in the box below.

General working methods and policy instruments:

- Peer-learning activities
- Studies and mapping exercises
- Information and publicity campaigns.

Specific policy initiatives and programmes

- EU Knowledge Valorisation Platform – repository of Best Practices
- European Knowledge Valorisation Week
- Horizon Impact Award
- European Research and Innovation Days
- Erasmus+
- ERA policy initiatives
- EIT KIC on CCSI
- JRC makerspace.

4.6. ESTABLISH DIRECTION AND MONITOR

Current dominant status

By investing in this study, the European Commission has signalled a clear interest to investigate the potential of involving arts and cultural organisations in fostering knowledge valorisation, including how the EU knowledge valorisation policy can support the further development of this potential for the benefit of society.

When deciding to implement European policy initiatives to further strengthen the uptake of such practices in Europe, a next step would be to translate this decision into a pragmatic **plan of action including targets (milestones) as well as a monitoring and evaluation cycle,** to ensure that progress[37] is made with respect to EU policy development promoting the systemic change needed to fully tap into the potential of arts and cultural organisations in knowledge valorisation processes.

SPARKING CHANGE – EC POLICY RECOMMENDATIONS

Since systemic change is a very complex process, where many stakeholders (including the European Commission) intervene at different levels, it is important to **be clear on what the European Commission will focus on to strengthen the role(s) of arts and cultural organisations in knowledge valorisation processes**, and monitor and evaluate the EC's efforts in that respect. We recommend to:

- start from the different policy recommendations formulated in this study (and relevant related work) to **decide on an internal workplan** within the European Commission that
    - defines short-term, medium-term and longer-term objectives of the European Commission with respect to fostering knowledge valorisation through the arts
    - defines key actions, responsibilities and necessary resources
    - outlines how these actions are expected to contribute to the envisaged systemic change.
- **define milestones and performance indicators** (quantitative and other) to monitor and evaluate the progress of implementation of policy actions, as well as the contribution(s) that they make to the objectives that have been set. Some examples of easy to monitor performance indicators are e.g.

[37] We remark that this progress can go in all directions, including deciding to stop EU policy support initiatives if evaluations indicate that this would be the most optimal option from an EU policy perspective.

- the (increase in) number of good practices in the EU Knowledge Valorisation repository that involve arts or cultural actors
- the number of Commission expert groups that include artists among its members
- the number of new strategic EU documents/initiatives making reference to the arts and cultural organisations as part of knowledge (valorisation) ecosystems.

A **more in-depth evaluation** can be considered after e.g., four to five years to take stock of the policy actions taken, and reflect on the impact they have on the envisaged systemic change. This reflection could be done together with other key stakeholders contributing to this systemic change and could be fed by an update of this study (or policy evaluation study).

Relevant policy tools

A range of EU policy initiatives and programmes are relevant to implement the recommendations provided. Some **priority actions** are listed in the box below.

General working methods and policy instruments:

- Inter-DG discussion groups
- Studies and mapping exercises
- Open Method of Coordination working groups and expert groups
- Stakeholder consultations.

Specific policy initiatives and programmes

- Knowledge Exchange Platform
- JRC EU Policy Lab
- Smart Specialisation Platform (for CCSI).

5. CONCLUSIONS

Based on the study, we conclude that:

- To generate a significant impact on society and push the uptake of research-results and innovation, **knowledge valorisation should be conceived as a circular and transversal process**, starting from the definition of the research questions. This process should ideally be collaborative and involve target users or civil society in general (the "valorisation objectives") right from the production phase. The **arts and cultural organisations are one of the possible actors to collaborate with** in the knowledge chain to come to impactful valorisation of knowledge coming from research.
- Fostering knowledge valorisation with the arts **can happen in all phases of the knowledge chain** or knowledge flow – from formulating the right research questions and communicating about new research results or innovations, to transforming data and research results into sustainable products and solutions that benefit society.
- Artists and cultural organisations dispose of a unique set of competencies – artistic skills, art thinking methods, artworks – with a clear potential to increase the valorisation of knowledge coming from research in society.
- Several **obstacles** still hamper the creation of multi-actor collaborations, above all:
    - silo thinking at actor and ecosystem level
    - a lack of awareness of the impact that the involvement of the arts can generate on valorisation processes
    - the absence of valorisation frameworks and indicators that foster the activation of such collaborations (especially at the level of research institutes and industry)
    - the difficulty of finding platforms and opportunities to meet all these different actors.
- The **role of policy makers** (at Member State and EU level) in creating the needed conditions to overcome these obstacles is crucial. They have a set of policy instruments that can incentivise systemic change in the way the arts and cultural organisations are involved in knowledge valorisation processes.

Despite the limited scope of this study, its **added value to the existing literature** lies in the following:

- the study proposes a concept of valorisation that goes beyond the pure dissemination of knowledge or technology transfer

- the study sought to shed light on as vast theme a as that of the collaboration of artists and institutions in research and valorisation processes and at the same time to organise the fragmented literature available through a holistic approach to them
- the polarised view provided by the existing literature has been overcome thanks to a series of sectoral consultations. The analysis benefited greatly from the interviews with sectoral representatives and from the focus group discussion with policy makers. The inputs received contributed to the creation of a holistic vision on the theme and to the co-participation design of policy recommendations
- this study analysed eight in-depth cases, covering a wide range of profiles, formats of collaborations and roles taken on by artists and institutions
- the study firmly anchors the policy recommendations to the analysis carried out, including that of existing policies at EU level
- a strategy to disseminate results has been conceived and aims to generate a medium-term impact, especially in terms of awareness raising. Already in the intermediate phase, for example, the results of the study and two case studies were presented during the 2022 EU Knowledge Valorisation Week, generating interest in the topics covered the days that followed.

However, due to the short timeframe expected for the research (5 months), the study inevitably brings with it some **limitations and constraints**:

- the study focuses on knowledge intended as the output of a research process, thus excluding other types of knowledge (e.g. informal knowledge, etc.)
- the study reflects on the benefits of the involvement of the arts for researchers in other disciplinary domains but does not focus on the motivations and benefits for artists and cultural institutions. The impact of multi-actor collaborations on the artistic knowledge and practice was not investigated
- the broader innovation context and the roles of other quadruple helix actors (researchers, policy makers, industry, civil society) in fostering knowledge valorisation was not in the scope. Although the analysis of obstacles and conditions covers the individual level, the focus is in fact on the ecosystem level and on the inter-relation between various actors.

Seeing these limitations and from the results achieved by this study the following **suggestions for future research** arise:

- there is a need to develop a solid framework for documenting and assessing the impact of arts-collaborations on knowledge valorisation in a systematic way. This also implies the definition of indicators that are tailored to the nature of these collaborations and the actors involved

- although geographic coverage was an underlying principle of this study, more evidence on under-represented areas of Europe is needed, particularly the regions of Southern and Eastern Europe. In addition, more research on how differences in regional development and innovation ecosystems impact collaborations with the arts is suggested
- an in-depth study of the obstacles and conditions for each actor in the ecosystem (researchers, industry, civil society, policy makers) and not only addressing the European Commission would be necessary to integrate the results of this study in their work and role and develop more elaborate recommendations for each actor
- the numerous practices collected in this study should be enhanced and inserted in a dissemination and capacity building trajectory with the various actors of the quadruple helix
- awareness raising projects are crucial to bring this topic to the next level and make the involvement of the arts in research and valorisation processes a common practice (when deemed relevant).

6. ANNEXES

Repository of literature

Scientific articles and studies:

N. Shaby, 'I know how it works!' student engagement with exhibits in a science museum, International Journal of Science Education, Communication and Public Engagement**,** Volume 9, Issue 3, 2019

M. Achiam, A framework for understanding the conditions of science representation and dissemination in museums, Museum Management and Curatorship, Volume 29, Issue 1, 2014

A. Bandelli, E. A. Konijn, An experimental approach to strengthen the role of science centres in the governance of science, 2011

C. Schnugg, An Organizational Perspective on ArtScience Collaboration, Journal of Open Innovation Technology Market and Complexity 6(1), 2020

C. Molinari, Approche communicationnelle des rapports entre arts et sciences : le cas des résidences et des festivals, Les Enjeux de l'information et de la communication 2018/1 (N° 19/1), 2018

A. B. Antal, A. Strauß, Artistic Interventions in Organisations: Finding Evidence of Values Added, Creative Clash report, 2013

S. Ball and others, Arts-based approaches to public engagement with research, 2021

J. Gabrys, K. Yusoff, Arts, Sciences and Climate Change: Practices and Politics at the Threshold scientific article, Science as Culture, Volume 21, Issue 1, 2012

G. Born, ART-SCIENCE From public understanding to public experiment, Journal of Cultural Economy, Volume 3, Issue 1, 2010

R. Malina, Art-Science: An Annotated Bibliography, Art Journal 75, 2016

J. Lapum, Arts-Informed Research Dissemination in the Health Sciences An Evaluation of Peoples' Responses to "The 7,024th Patient" Art Installation, SAGE Open 4(1), 2014

C. Cartiere, J. Wingate, Collaborating with Nature: Public Art and the Environment, Public Art Dialogue, Volume 9, Issue 2 2019

K. Minski, Collaboration in experimental art: case studies in co-creation, transdisciplinarity and art-science practice at Ars Electronica Futurelab, PhD thesis, 2020

U. A. Seregina, Co-creating bodily, interactive, and reflexive knowledge through art-based research, Consumption Markets & Culture Volume 23, 2020 - Issue 6

A. Schnugg, Creating ArtScience Collaboration, 2019

E G Carayannis and David FJ Campbell, Developed democracies versus emerging autocracies: arts, democracy, and innovation in Quadruple Helix innovation systems, Journal of Innovation and Entrepreneurship 2014, 3:12

J. G. Bertling, Expanding and sustaining arts-based educational research as practitioner inquiry, Educational Action Research, Connecting Research and Practice for Professionals and Communities, Volume 28, Issue 4, 2020

J. Clifton-Ross, Frameworks and Models for Disseminating Curated Research Outcomes to the Public, SAGE Open, 2019

L. H. M. van de Burgwal, A. Dias, E. Claassen, Incentives for knowledge valorisation: a European benchmark, The Journal of Technology Transfer volume 44, pages1–20, 2019

J. Boydell and others, Ineffable knowledge: Tensions (and solutions) in art-based research representation and dissemination, 2017

Grahame F Thompson, Interdisciplinary complexities, Journal of Cultural Economy, 9:3, 322-329, 2016

J. Jacobs, Intersections in Design Thinking and Art Thinking: Towards Interdisciplinary Innovation, Creativity, Vol. 5, Issue 1, 2018

M. Hladchenko, Knowledge valorisation: A route of knowledge that ends in surplus value (an example of the Netherlands), International Journal of Educational Management, v30 n5 p668-678, 2016

A. Barry, Logics of interdisciplinarity, Economy and Society, Volume 37, Issue 1 2008

P. J. Nicholson and others, Malawi Stories: mapping an art-science collaborative process, Journal of Maps, Volume 15, Issue 3: Art-Geoscience, 2019

A. Bencard, L. E. Whiteley, Mind the Gut—displaying microbiome research through artistic collaboration, Microb Ecol Health Dis., 29(2), 2018

A. Bandelli, E. A. Konijn, Museums as brokers of participation: how visitors view the emerging role of European science centres and museums in policy, 2015

J. Bell, Museum–University Partnerships as a New Platform for Public Engagement with Scientific Research, Journal of Musuem Education, 2016

W. Rössig, L. Jahn, Role of university museums and collections in disseminating scientific culture, Ecsite series, 2010

G. Thurgood, Science as a catalyst for art, Interdisciplinary Science Reviews, Volume 20, Issue 3, 2014

M. Ingram, Sculpting Solutions: Art–Science Collaborations in Sustainability, Environment Science and Policy for Sustainable Development 54(4):24-34, 2012

A. Dell, Soil Narratives: Toward a Symbiotic Art-Science Activisim, Public Art Dialogue, Volume 9, Issue 2, 2019

A. Yaneva, Staging scientific controversies: a gallery test on science museums' interactivity, Public Understanding of Science 18(1):79-90, 2009

A. Orrghen, Surveying the literature on technoscience art: from pioneer stories to collaborations between artists, scientists and engineers as the object of study, Digital Creativity, Volume 28, Issue 2, 2017

C. Hussler and others, Taking the ivory from the tower to coat the economic world: Regional strategies to make science useful, Technovation 30(9):508-518, 2010

D. J. Pesut, The art, science, and techniques of reframing in psychiatric mental health nursing, Issues in Mental Health Nursing, 2009

M. W. Bauer, The mobilization of scientists for public engagement, SAGE Open, 2011

G. Stocker, A. J. Hirsch, The Practice of Art and Science, 2021.

Sutherland, S. Krzys Acord, Thinking with art: from situated knowledge to experiential knowing, Journal of Visual Art Practice, 6:2, 125-140, 2007

P. Benneworth, Tracing how arts and humanities research translates, circulates and consolidates in society. How have scholars been reacting to diverse impact and public value agendas?, Arts & Humanities in Higher Education, Vol. 14(1) 45–60, 2015

F. Geerling Eiff and others, Triple helix networks matching knowledge demand and supply in seven Dutch horticulture Greenport regions, Studies in Agricultural Economics 119, 34-40, 2017

S. Schawn, Understanding and Engagement in Places of Science Experience: Science Museums, Science Centers, Zoos, and Aquariums, Educational Psychologist, Volume 49, Issue 2, 2014

D. J. Curtis, Using the Arts to Raise Awareness and Communicate Environmental Information in the Extension Context, The Journal of Agricultural Education and Extension, Competence for Rural Innovation and Transformation, Volume 17, Issue 2, 2011

M. Van Geenhuizen, Valorisation of knowledge: preliminary results on valorisation paths and obstacles in bringing university knowledge to market, 2010

L. Roosen and others, Visual art as a way to communicate climate change: a psychological perspective on climate change–related art, World Art, 2017

U. Hahn, Visualizing climate change: an exploratory study of the effectiveness of artistic information visualizations, World Art, Volume 11, Issue 1, 2021

P. Benneworth, B. W. Jongbloed, Who matters to universities? A stakeholder perspective on humanities, arts and social sciences valorisation, Higher Education volume 59, 2010

P. Hamilton, E. C. Ronning, Why Museums? Museums as Conveners on Climate Change scientific article, 2020

A. Deserti, M. Real, F. Schmittinger, Co-creation for Responsible Research and Innovation, 2022

The Impact of Science and Discovery Centres: A review of worldwide studies, ECISTE series, 2008

Macfarland C., Agace M. and Hayes C. (2020), Creativity, Culture and Connection - Responses from arts and culture organisations in the COVID-19 crisis

Toolkits:

- 6 current models for collaboration between artists and tech/nologists in the United States, ART+TECH report, 2019
- Co-creator navigator
- Designing support measures promoting connections between artists and ICT, Interreg Project 'RegionARTS' publication, 2019
- Handbook on good practices for valorisation of R&D results, Interreg Project 'Train2' publication
- KiiCS Guide, 2015
- Public Engagement, Knowledge Exchange and Impact: A Toolkit for HERA Projects, 2021
- Research Catalogue - an international database for artistic research
- Societal engagement with research - empowering by engaging, brief, 2018
- STARTS collaboration toolkit, 2020
- STARTS residencies brochure, 2020
- The Dynamics of Exchange: A review of Knowledge Exchange activities for the HERA Cultural Encounters Joint Research Programme, 2016
- The importance of the science-policy dialogue, ECSITE series, 2019

Position papers, interviews and articles:

- A strategy to connect contemporary science and contemporary art, Position paper, 2019
- ArtScience Manifesto Manifesto

- Being open to science and society, ERC, 2018
- Citizen labs, basis for universal innovations ecosystems, ECSITE series, 2018
- Collaborations with artists go beyond communicating the science, 2021
- How to shape a productive scientist–artist collaboration, February 2021
- Match makers - artistic residencies at research facilities, ECSITE series, March 2016
- Material from the EU 2021 Knowledge Valorisation week 2021
- Recherche scientifique et créativité artistique font bon ménage, Daily Science, 2021
- Where science meets society, 2021
- Whitepaper Art Driven Innovation, 2020

LIST OF INTERVIEWEES

Between November 2021 and January 2022, **exploratory interviews** were conducted with representatives of the following organisations and initiatives:

Organisation/initiative	Date of interview
In4Art	5/11/2021
Ars Electronica	16/11/2021
NEMO (Network of European Museum Organisations)	17/11/2021
ECHN (European Creative Hubs Network)	17/11/2021
SUSTAIN project	2/12/2021
Waag Technology & Society	9/12/2021
Humanities in the European Research Area (HERA) Arts and Humanities Research Council	10/01/2022

Case study interviews were conducted in January 2022 with representatives of the following organisations and initiatives:

Organisation/initiative	Date of interview
Ljudmila	06/01/2022
Ca' Foscari University of Venice IUAV University	10/01/2022
Nova Iskra	12/01/2022
Natural History Museum of Vienna / Deck 50 Ars Electronica	14/01/2022
Biofriction project	28/01/2022

FOCUS GROUP

The focus group was organised online on 25 January 2022, from 10h to 12h, with representatives of the following organisations:

Organisation
Avans University of Applied Science, Center of Expertise Sustainable Business
De Haagse Hogeschool
European Commission - DG EAC
European Commission - DG RTD
European Creative Hubs Network
Flemish Government - Department of Culture, Youth and Media
Freelancer / European Commission expert
FWF Austrian Science Fund
Government of Greece - General Secretariat for Research and Innovation
HERA Network - Humanities in the European Research Area
IDEA Consult (moderator)
KULeuven, Faculty of Business & Economics, Managerial Economics, Strategy and Innovation
NEMO Network
Nova Iskra
UK Arts and Humanities Research Council

CASE STUDIES

The following **eight case studies** have been selected for in-depth analysis:

1. ARTIFICARE (Italy)
2. Nova Iskra (Serbia)
3. Deck 50 (Austria)
4. Biofriction (Spain, Slovenia, Finland)
5. ART4MED (France, Slovenia, Netherlands, Finland, Denmark)
6. Disentangling European HIV / AIDS Policies (Germany, Poland, Turkey, UK, and the European level)
7. Prosthetic X (Netherlands)
8. Ljudmila (Slovenia)

Case study 1	
Key data	
Title	ARTIFICARE
Type	Temporary project (2017-2018)
Country	Italy
Region	Veneto
Project funders	European Social Fund- Veneto Region. The call for research grants was published on the website of the Ministry of Culture and aimed to investigate the role of broker / mediators in local innovation ecosystems.
Keywords	art-based methods, art thinking, business innovation, mediation, collaboration
Promoter/lead partner, other partners and beneficiaries	

Promoter/lead partner	The project is a collaboration between Ca' Foscari University of Venice (Management Department, m.a.c.Lab) and IUAV University (Project Cultures Department)
Other partners	Three post-doc researchers were hired to manage and monitor the project
Beneficiaries	Eight local SMEs belonging to different sectors: Ugolini (mechanical sector), De Castelli (home system), OMP Italia (life support), Cultur Active, Fondaco, Fallani (tourism and goods cultural), DelineoDesign (industrial design) and DAAM Studio (corporate communication). Artists: Andreco (pseudonym) for De Castelli, Francesco Mattuzzi for DelineoDesign, Valentina Furian for Ugolini, Michele Spanghero for OMP, Gli Impresari for Fondaco, Blauer Hase for Fallani and Alfred Agostinelli (pseudonym) for Cultur Active.
Intervention logic	
Stated objectives of the project	The project aims to investigate the **connection between arts-based processes and the innovation and competitiveness of enterprises**, by deepening the processes of "artification" of companies. To do so, the project focuses on the interaction between artists/artistic processes and Veneto SMEs and aims at studying the genesis, development, possible consequences of inserting artists and artistic logic in Veneto SMEs. The project originates from the idea that, in order to develop the company's creativity and boost innovation, the traditional managerial and motivational incentives or the simple enterprise exposure to artistic production seem not to be enough. On the contrary, the key seems to be a **structured relationship and more interaction**, the so-called *"artification"*, in which the artistic activity fits with the traditional business activities, engages them in dialogue, enriches them with new meanings and methods and contributes to research and innovation within the enterprise.
Role of the arts	"Artificare" the company means "to enable creative processes according to the logic of artistic production, receiving benefits in terms of strategic and technical innovation, but also accepting

	and learning to manage the complexity resulting from the insertion of a logic, the artistic one, that is in many ways different from the one of a company". Such complexity, re-conceptualised as an opportunity and translated into a flexible attitude by the involved company, acts as a **driver for innovation** and allows the development of those creative and managerial skills that are decisive factors for competitive success of the Veneto socio-economic reality.
Activities	The activities are carried out at three different levels: 1. the artistic and curatorial level which aims to support the artistic process 2. the company level, which aims to study the impact on the organisation and the people who are part of it 3. the socio-economic level, which investigates how these projects go beyond the artists and the companies involved and affect the socio-economic situation in a region In addition to this "proactive" part, external processes, events, seminars, study tours, interviews, and a literature review were also conducted. Communication activities also aimed at disseminating information on the relationship between artists and enterprises on an ongoing basis, through their own channels of communication. The **action research interventions** are designed by combining: • the activation of an artistic residence in the company as pre-innovation training, and • the development of cultural mediation between art and business. As for the activation of an **artist residency**, the action research for the company represents a virtuous combination of artistic creativity and competitiveness. The action is aimed at the realisation of an artistic work and related workshops to emphasise the relationship and the dialogue with the company's corporate technical environment. The artistic action was not an end in itself but involved corporate infrastructures and aimed to establish deep dialogues with the context and the people who

	live it every day. The artists were asked to interact personally with the company for a minimum of 55 hours, divided into about two months of work. Concerning the **development of mediation between art and business**, operationally the action research was designed by the post-doc researchers of Ca' Foscari and IUAV, who added up curatorial & artistic skills to creative industries' management ones. The mediation intervention between two worlds with different operating modes, different goals and different ways of thinking was a crucial point for the success of the project.
Challenges encountered	• A general challenge relates to the **difficulty to move beyond the idea of the arts as tools for decoration or entertainment** and instil a new mindset that considers the arts as integrated into a strategic transformation process that involves personal development and leadership, culture and identity, creativity and innovation. • **Mutual understanding** between the artist and the entrepreneur is a delicate phase, as different factors converge in it, such as those related to the psychological and sociological sphere including affinities, impressions, exchange of ideas and perspectives. • It is important that there is an **involvement of employees at various levels** (from the company contact person to the worker), that there is maximum participation in the activities and support for the production of the output, and, above all, that the interaction takes place in a relaxed and collaborative atmosphere. • Another challenge is to make sure that the value generated by arts-based methods manages to **permeate the corporate body**, to the point of being able to continue to manifest its effects even after the collaboration has ended.
Principal results and impact	Impact on artists and companies' works: • As for the <u>main benefits obtained by the artist</u>, these concern the strengthening of artistic identity, the experimentation with new materials, the contamination with different know-how and expertise, the possibility of interacting with new spatial contexts and different professional figures, the acquisition of new skills and

	understanding of different social and interpersonal dynamics, the acquisition of new languages and stimuli for artistic creation, the enhancement of one's work and company tasks, the reversal of one's point of view, the construction of a polyphonic message, the creation of coherence between artistic thought and organisational reality through metaphor. • For the company, the main advantages are above all the acquisition of new ideas for the development of the brand, the corporate image, the dissemination of know-how through new channels and methods, the dissemination of corporate values through art, team-building actions, the transfer of experience, corporate legacy, the dissemination of new values within and outside the organisation, the development of latent ideas within the company, the strengthening of company image, the creation of new stimuli for management, the greater understanding of the interpersonal dynamics existing in the company context, innovative thinking. Artistic collaboration assists the management of internal business change processes, linked to changes in the organisational structure, expansion of the range/production line, opening towards new markets and, in general, new strategic choices that involve a challenge for the company. In this case, the intervention is communicated less externally but has an important internal impact. In general, one of the main benefits suggested by entrepreneurs who have experienced collaboration with artists in their company is certainly that of spreading knowledge generated by the vision of the artist and his work in the company, as a result of mutual trust relationship between the artist and the corporate figures involved in the collaboration.
Main takeaways and potential for learning	1. Artistic interventions in organisations are mainly based on personal and interpersonal levels since it is on them that interactions act in a particular way. 2. Learning is generated in what is called interspaces, where participants experience new possible ways of seeing and thinking compared to the norm.

	3. The effects generated by artistic interventions can go beyond the personal and interpersonal sphere and emerge also at the organisational level. 4. The emergence of these effects at the organisational level occurs especially if the leadership actively supports the learning generated in the interspaces. 5. In some cases, unexpected positive effects have been noted that have extended beyond the boundaries of the organisation and that have enriched relations with stakeholders.

Sources

- Interview with the project leaders, conducted on 10/01/2022
- Project website: https://www.maclab.info/artificare/
- F. Panozzo, S. Cacciatore, *A Model of Cooperation between Art & Business*, June 2018.
- D. Bianco, Sulla relazione tra Arte e Impresa: modelli ed esperienze. Approfondimento: il progetto Art & Business e l'artificazione delle imprese, Master's thesis, 2017.
- YouTube channel AIKU Arte Impresa Cultura: https://www.youtube.com/channel/UCcqHPltTh3olGz7hW6ULUGQ/videos.

Case study 2

Key data	
Title	Nova Iskra
Type	Permanent organisation (creative hub)
Country	Serbia
Funding model	NOVA ISKRA is a hybrid type of organisation consisting of two legal entities (Non-Governmental Organisation and Limited company). Initially, a fundraising campaign was launched to start the activities. In the very beginning, Nova Iskra received support to start

	building the first space in Belgrade. There was in kind and some financial support from the big national and international companies.
Keywords	social innovation, multidisciplinary, education, hubs, creativity, collaboration
Mission, stakeholders involved and beneficiaries	
Vision and mission	Nova Iskra designs spaces and experiences for people, organisations and business (NGOs and private companies) in order to innovate, create, and learn together. Nova Iskra is a hybrid, fully independent venture and transdisciplinary educational and research platform for design, creativity, architecture, and new technologies, connecting the creative community with industry and society. At the same time, it is one of the first co-working spaces for the professionals related to creative industries in Serbia. Relying on design-thinking methodology as the basis for conceiving, developing and testing contemporary ideas and concepts, Nova Iskra examines and supports the development of innovative, alternative and sustainable models of education, organisation and production through collaborative work, experimentation and critical reflection. Nova Iskra perceives itself as a bridge between the arts community and business sector, plus academia (even though the collaboration is not yet active as with other actors). Nova Iskra has a strong focus on young people and considers itself as a platform for young people to connect on the topic they are interested in (social and justice, ecology, education, etc). Their aim is to empower young creatives and make them aware of the future around them. Nova Iskra conducts its operation on three levels: 1. through running and renting an inspiring and dynamic space for work and creative collaboration – COWORKING; 2. through initiating projects and organising various lectures, seminars, workshops and presentations for young professionals on various topics (sustainable production, alternative organisation, green economy, new technology, design, architecture and entrepreneurship) - EDUCATION PLATFORM; and

	3. through supporting innovation and collaboration within businesses, organisations and companies - CREATIVE STUDIO.
Team	The management team of Nova Iskra today consists of six members, consisting of managers and professionals with broad experience in cultural management, marketing and PR, production, education and trainings, consultancy, program and project coordination, etc.
Policy context	Serbia is preparing for membership in the EU, which also obliged the policy makers to adopt the policies to EU standards. Also, because Serbia has been using several funding programs, some ministries and agencies are promoting youth policy and social innovations.
Intervention logic	
Activities	Arts-based methods are applied in all projects, but in some this is more visible. Of all of their activities, they try to ensure that 1/3 of participants comes from arts field (in longer-term projects). There are several programmes that involve artists, including: meet ups, presentations, residencies, and exhibitions. In all of these formats,

	they tend to create multidisciplinary groups of participants: creatives, but also students from other domains. Considering the purpose of this study, this case study focuses on those activities where a partnership or an informal connection is established between enterprises or the public sector and professionals from the field of creative industries. The hub carried out several temporary or more long-term projects and initiatives. **Three flagship projects** include: • Food is Culture: this project aims to make European citizens aware that their food heritage is a way of expressing their belonging to Europe, and to better understand the richness and uniqueness of its cultural diversity. The main activities include a multimedia artwork—which combines contributions from artists and travels around Europe, a call to action aimed at chefs and school students, the creation of a human library with migrant stories and a call to EU and national institutions to give the safeguarding of European gastronomic cultural heritage a higher priority in their political agendas. • Made In Platform: MADE IN is a research, design and heritage platform that proposes new collaborative practices and knowledge exchange between the traditional craftspeople and contemporary designers. It engages craftspeople, designers, researchers, curators and theoreticians on a quest to pose relevant questions about the topics of heritage and production in today's society through research and archiving of local crafts, conducting workshops and residencies and promoting ideas through a travelling exhibition. • Connect for Creativity: the project aims to form a network of creative hubs across Europe to foster creative exploration and collaboration that contributes to building a more cohesive, open and connected civil society.
Challenges encountered	According to the internal team, it is not hard to implement the arts-based processes and methods when working in the context of EU programmes (e.g., Creative Europe and Erasmus+). The main challenge remains to transfer the arts component into local projects because the **arts in general and the creative sector in particular are not sufficiently recognised at the local level as driver of**

	innovation. Nova Iskra feels to be perceived as a 'weird player' in the local context. Another challenge includes the collaboration with businesses. They are often sceptical of working with artists and art-based methods in general, so collaboration often starts without mentioning these kinds of methods. Only after a series of meetings, Nova Iskra introduces the company to arts-based methods and how they can benefit from them.
Principal results and impact	Beyond the impact generated on growth and employment, Nova Iskra is an example of a hub providing a space for connection between creatives and businesses, giving them the instruments to build successful collaborations, via capacity building programmes. In general, Nova Iskra's impact is presently visible on the micro-level (the impact on user), meso-level (the impact on the community and organization) and, to much lesser extent, macro-level (the impact focusing on society). From a quantitative point of view, the success of their activities is perceived by the number of people empowered through their capacity building programme, the number of new initiatives (solutions) and the sustainability of the initiative and created solutions. The cross-sectoral knowledge transfer mechanisms emerge as the result of the cooperation with the actors from civil, private and public sector and the networking between a wide range of actors. In particular, the majority of the knowledge transfer was gained through interaction, collaboration, co-design and co-creation with the young professionals, creatives, users and stakeholders. Constant interaction with the local community led to the development of the new solutions for their unmet needs. Nova Iskra facilitated and built partnerships among many stakeholders that work on various issues or projects at local, regional and global level. In this respect, interdisciplinary teamwork and networking are not only services offered by Nova Iskra, but the tools used by the team for their own development as well.

Main takeaways and potential for learning	The case of Nova Iskra presents potential learning at two levels: 1. At the level of activities and programmes, the activation of arts-based processes and methods demonstrates how the arts are the basis of industrial innovation. The case illustrates that training and capacity building are an important pre-condition for starting collaborations as it helps creatives to stay informed, gain or improve skills, learn, and network. Realising that life-long learning is the core precondition, not only for the team members, but also for the development of the innovative ideas of the professionals and clients of Nova Iskra. 2. At the organisation level, the creative hub itself has to be considered as an innovative practice, as it provides both the space to build collaborations between different actors and the tools necessary to establish such collaborations.

Sources

- Interview with the project leaders, conducted on 12/01/2022
- Organisation website: https://novaiskra.com/en/
- Social Innovation Community, *Nova Iskra Social Innovation Laboratory*, 2016

Case study 3	
Key data	
Title	Deck 50
Type	Permanent project in cultural institution
Timeline	The origin of Deck 50 dates back to 2014 where some museum's employees met with various other professionals and shared the vision that today's exhibition locations have a changed commitment and a new responsibility, especially towards the younger generation. During intensive conversations initial project ideas were sketched out. This enthusiasm and the common will to initiate a transformation process drove a small group of the NHM to initiate Deck 50.

Country	Austria – city of Vienna
Project funders	The project is funded by the Austrian government, main funder of the museum, through a special fund to set up collaborative public spaces in museums.
Promoter / lead partner, other partners and beneficiaries	
Promoter/lead partner	The museum is a leading institution, hosting almost 30 million objects, and is a historic place in the city centre of Vienna. It perceives itself as the cultural hub spot in the area. The mission of the museum is to make these collections and topics come alive by fixed installations, events, exhibitions, etc.
Other partners	The museum partnered with Ars Electronica to develop the concept of Deck 50 and realise it. At the moment, Ars Electronica is no longer involved in Deck 50, except for the technical guidance and maintenance, but the museum is open to collaborate again in the future in the light of the past cooperation.
Beneficiaries	The main beneficiaries of the project are the civil society and the scientific community. The project is still in an initial phase and has the ambition to '*talk to farmers, biotech companies, scientists from other disciplines, and NGOs'*.
Intervention logic	
Stated objectives of the project	The rationale behind Deck 50 is that people today want to get involved and be part of the decision-making process – not only in politics and society, but also when they visit museums. They wish to be freed from their passive role as mere recipients of information and instead become active co-creators and collaborators in educational activities and design processes. Through a participatory process, the Natural History Museum (NHM) has developed a new vision: "*The goal of the museum is to make a significant contribution to sustainable development in Austria, Europe, and the world. We want to achieve this through our excellent disciplinary, interdisciplinary, and participatory research, by opening up our collections digitally, through innovative, inclusive, and inspiring approaches to science*

	communication, and by making the museum carbon neutral by 2030." Deck 50 is an important physical and virtual place of science communication and citizen science to realise this vision. The main aim of Deck 50 is to foster dialogue and discussion with various social groups on the major issue of the relationship between humans and nature. The topics are wide-ranging, encompassing everything from values in nature conservation to fisheries policy or sustainable practices in clothing production. Thanks to Deck 50, the NHM aims to activate open innovation processes and develop new products and solutions together, with the focus on sustainability and in an open innovation process. This is done by building on the knowledge in the collections and related in-house research and opening up research processes to the entire scientific community. Deck 50 opened in September 2021, virtually in a first moment and then physically once the sanitary measures related to COVID-19 allowed. The innovative aspect is that it is in a historical institutional building, featuring a very handy, easy-going tool and platform and people love to use it in this environment. At the beginning, it was thought that the space could have been rented to externals, but eventually it was decided to follow another direction.
Contribution of the arts	The entire project, and especially the media stations, were developed through the collaboration with the Ars Electronica FutureLab and its artists and creatives. The team plans to involve systematically the arts academy of Vienna and to create a platform for exchange between artists and scientists. The aim is to co-produce solutions to convey knowledge, to make the artistic approach find new perspectives on science, both in terms of content and engagement strategies for people who don't have the scientific code as academic sphere uses. Artists are conceived as catalysts of a new form of dialogue. At the same time, the artistic work itself benefits from the interaction with scientific research and access to collections (several artists have already asked to collaborate).

Activities	Various formats and methods have been put in place to achieve the goals, from temporary exhibitions to multimedia stations to workshops and events. An example of multimedia station includes scanning tables where visitors can draw their own animal or creature, where in general, they can create new insights and make new connections. Surveys are also submitted via the stations or mobile components. The content of the installation is based on research conducted in-house and they focus not only on collections of the museum, but also on hot topics at global level (e.g., the return of the wolf in Europe). The content of the multimedia installations can change and can be filled with different content (Ars Electronica developed a flexible platform). Via the multimedia stations, it is possible to communicate and disseminate research results, and to receive inputs from visitors and participants to the laboratories. At the moment, although the feedback from visitors is digested by scientists, this is not done systematically, but there is the intention to make this a mainstreamed practice. Deck 50 is also the space to activate dialogues promoted by policy makers, such as a structured dialogue on the SDGs, organised by and with the Austrian government. These activities are developed in the context of a specific citizen science strategy that the museum is developing to bridge the gap between scientists and citizens and maximise the role of society in research processes.
Challenges encountered	• Several years and lobbying efforts were needed to get the necessary decisions and funding. • A social lab has been launched during the concept phase to gather different stakeholders from civil society and the scientific community. The aim was to co-create a vision and co-define objectives of what Deck 50 could achieve. Although the process was successful, it has been challenging to convince the museum and the in-house scientists that this process was needed. On one side, the museum is a traditional hierarchical institution that needs to be pushed towards innovation, on the other, inclusive effort

	was needed to get the scientific community on board. However, the whole community participating in the social lab was very satisfied and recognised the added value of such initiative in the end. • Deck 50 was opened in the middle of a pandemic and, although live streaming was handy, the audience was still reluctant and sceptical.
Principal results and impact	The museum has elaborated an **evaluation matrix** to make the assessment process transparent. Evaluation and research are considered as key to exploring the function of Deck 50. The formal evaluation process will be conducted in 2022. However, a preliminary evaluation exercise was conducted between 2020 and 2021, although Deck 50 was not yet open physically, but only virtually (due to the pandemic and consequent lockdown). This first evaluation was conducted in partnership with the Faculty of Economics and Tourism of the University of Vienna and has been enriched by feedback of the visitors collected by explainers, once the space was finally open to the public. Deck 50 has informally received the appreciation of the scientific community, especially of the younger scientists who are very interested in the platform and have already booked the space for the whole year. The evaluation process builds on the knowledge that is present in the collections and related in-house research. Opening up research processes are not only part of the new NHM strategy, but also a focus of science policy at European level. Just as the EU hopes that Open Science will strengthen research, safeguard quality of life, and address global challenges such as climate change and biodiversity loss, the NHM also wants to make its own contribution.
Main takeaways and potential for learning	The museum received many requests from different stakeholders to work in Deck 50: scientific community, NGO and people in the arts. The value is in the infrastructure, institutional recognition and 'it was just much needed'. New groups and new stakeholders found the space in the museum thanks to Deck 50. The advantages of fostering such cooperation and integrating visitors lie above all in those areas where the local, practical knowledge of the community overlaps and combines with the

	systematised knowledge of research departments. The debates that take place at these intersections underline how research is conducted and contribute to a better understanding of research issues in the wider population. At the same time, such exchanges make research work more relevant to society and therefore create greater acceptance in the population of this research work and its results.

Sources

- Interview with all the partners developing Deck 50
- Museum website: https://www.nhm-wien.ac.at/
- Article 'NHM Deck 50 - Participative platform for science communication': https://ars.electronica.art/futurelab/de/projects-nhm-deck-50/
- Deck 50 report, developed by NHM of Vienna

Case study 4	
Key data	
Title	Biofriction
Type	Creative Europe project – sub strand Culture
Timeline	October 2019 to October 2021
Country	Spain, Slovenia, Finland
Project funders	Co-funded by the European Commission under the Creative Europe programme
Budget	200.000 EUR
Promoter/lead partner, other partners and beneficiaries	

Promoter/lead partner	1. Hangar, Spain 2. Kersnikova, Slovenia 3. Bio art society, Finland 4. Cultivamos Cultura, Spain
Other partners	The project was coordinated by the freelance researcher Laura Benitez Valero, who was contacted by Hangar to build on a previous EU-funded project on open health (already coordinated by Hangar) to continue research and establish hybrid spaces to enable collaborations. Together, they started to work on the idea of Biofriction and spent almost one year writing the project proposal.
Intervention logic	
Stated objectives of the project	Biofriction is a research project with the goal of **generating and facilitating spaces for exchange where artists, curators, theoreticians and different social collectives**, such as activists and educational projects, can collaborate in transdisciplinary experimental proposals that offer practical alternatives to existing problems in contemporary Europe, such as the rise of essentialist discourses that launch not only a worrying discourse but also policies of marginalisation and exclusion. The project team had the specific intention to put the focus on knowledge making and knowledge transfer and to reply to the question 'What kind of knowledge is created when hybrid practices take place and how can knowledge transfer (positively) affect the cultural context? What changes does it bring?'.
Role of the arts	The term biofriction refers to the **combination of biology, biotech, fiction and arts as surfaces of friction**. The project explored the physical, emotional and political relationships between biomaterials, humans and "others" through friction and is a critical analysis of the emancipatory potential of biotechnology through interfaces in the context of artistic practises. Therefore, the main project activities aimed to address **bioart and biohacking practices as triggers that challenge responsibilities as collective agents capable of making transitions** between multiple levels of political, material and conceptual organisation, taking **artistic practices and its performativity as a framework and condition of possibility**. Biofriction comes from an analysis of the differences between

	classical physics and quantum physics and how they affect artistic practises as well as epistemology, ontology, ethics, aesthetics or politics.
Activities	Within the Creative Europe typologies, Biofriction is a project based on transnational mobility of artists and cultural professionals as well as researchers, as it was considered of the key importance for encouraging meetings of creative people. As a result of the COVID-19 pandemic and postponed activities, the team organised Braiding Friction, a series of working groups and online events to instigate an informed discussion on the current situation and possible scenarios. During these sessions, participants raised questions related to the pandemic situation and engaged in discussion with artists and scientists. One of the main activities of the project was the **co-development of a glossary (a common language among partners and artists)**. This was not an academic exercise, but an effective working tool that states what terminological uses have operated within Biofriction. However, each term can still be re-visited, disarticulated and, re-articulated. Every term is mutable and processual, corresponding to a micro-community of historically and culturally situated agreements and covenants.

Challenges encountered	The entire process needed a lot of dialogue and communication as there was a 'suspicious' approach at the beginning between scientific researchers and artists. In the end, they realised they have similarities and scientists became key for the artist and vice versa. The glossary was key to create a common ground and the right tool to start working together. Another challenge encountered was represented by the consequences of Covid-19, that led to the postponement of physical residencies and activities. No challenges were detected at the level of collaboration. In general, the main challenge was to claim that artistic practices are producing knowledge in the same way scientists do. The challenge was to overcome the binary conception of objective versus subjective knowledge.
Principal results and impact[38]	From an internal perspective, team working and collaboration among various partners was crucial. It was easy to set up a partnership as the partners already met in the past in the context of the Ars Electronica. According to the team, this platform was crucial to connect and exchange knowledge (especially for the online archive). This festival is a reference for these types of open practices, as it promotes collaborations and partnerships (in this setting, it is easy to discover practices and to meet people and set up non-formal meetings). One of the main legacies of the project is the establishment of **long-term partnerships**. Biofriction has been committed from the beginning to nurturing, as far as possible, networks between experimental laboratories that become a meeting-space. A survey was submitted to receive feedback from scientists, artists and citizens: • The vast majority of participants considered the activity as appropriate for exchanging knowledge, experiences and common approaches and liked it. Almost all attendants answered that **the activity encouraged them to attend similar activities in the future.** In almost half of the answers participants confirmed developing more positive connotations to

[38] From the Biofriction final report.

the concepts of trans, (bio)hack, feminism, hybrid, and biomaterials after participating in an activity organised by the project consortium. No one developed negative connotations.

- One of the elements that emerged from the comments is that both, **participants and artists, found it extremely useful to come together, meet and share, discuss**, whether in person or online, with people with similar interests and areas of work. This is relevant in a field as bioart and biohacking where the community is rather small. In this sense, the project has reached one of its goals which was to foster connections among artists, scientists, activists, etc. Being an international and heterogeneous group, transcultural dialogue was fostered as well. Several artists in residence underlined that the most unexpected and surprising result of their residency has been the **level of collegiality with the scientists and the generosity with their time and expertise** that has inspired the future development plans of their artistic projects.
- More than half of the artists consider the **possibility of following up their artistic project in collaboration with the people who have joined the process during the residency**. In this sense, we can consider that the goal of creating and supporting hybrid spaces for knowledge creation has been attained.
- Another element that has been underlined as positive by participants is the practical side of the program. A constructive point of the workshops was **putting into practice the knowledge explored during the talks and open labs**. Participants particularly enjoyed learning how to directly deal with living organisms and learn about specific methodologies and approaches as, for example, the transhackfeminist approach. In this sense as well, the project has reached the goal of enhancing transfer of knowledge in an open environment and favour capacity building for cultural operators.
- Finally, most of the artists appreciated the fact that the four **institutions acted as gatekeepers** to propose their work to other institutions of the city including universities, arts centres, galleries, festivals, etc. The four centres have offered to resident artists and their projects the necessary support to spread their project into the local community in an effective way.

Sources
• Project website: https://biofriction.org/ • Biofriction final report • Biofriction open call • Interview with the project promoter

Case study 5	
Key data	
Title	ART4MED
Type	Creative Europe cooperation project (sub-programme Culture)
Timeline	Nov. 2020 to Oct. 2022
Country	France, Slovenia, Netherlands, Finland, Denmark
Project funders	European Commission
Budget	197,479 EUR
Promoter/lead partner, other partners and beneficiaries	
Partners	Digital art international (France) Stichting Waag society (Netherlands) Laboratory for Aesthetics and Ecology (Denmark) Bioart Society (Finland) Kersnicova (Slovenia)
Intervention logic	

Stated objectives of the project	The project aims to foster art practices from the perspective of hands-on medical humanities, which help to understand medical practices and research in a changing societal environment. ART4MED aims to: • build-up interdisciplinary transnational cooperation between artists and the health sector in order to support and produce exploratory art projects that promote access to healthcare; • open new creative fields of experimentation for artists to challenge the current status of science and healthcare; • enable cross-fertilisation and sharing of knowledge, technologies, skills and experiences among artists, researchers and open/citizen science communities, and provide conditions for fruitful and creative exchanges. By collaboratively co-designing methodologies and discussing their implementation in local contexts, we can learn from each other, identify best practices and opportunities to grow our own communities with long-lasting bonds; • produce open and transferable resources to better understand co-creative processes between art, science and technology; • raise audience awareness of the role of artists in opening disruptive paths that significantly tackle societal and technological challenges in access to healthcare, beyond the scope of existing art-science peer communities.
Role of the arts	Contemporary investigative artists **engage in discussions** around policies of access to healthcare, global issues related to development aid through to training and empowerment (from the socially marginalised to the ethnically racialised minorities of both heavily industrialised and less industrialised countries), the claim of corporal autonomy, “xenopolitical” subversion and the desacralisation of science and academic medicine. Artists remind us that subversion, or at least established points of resistance, is a precondition for citizens to take control of the challenges posed by science. Medical professionals, living labs and open science communities appreciate these creative mindsets, as well as their **unique approaches to discussing ethical values and equity in access**

	to healthcare. However, these fragile collaborations still have difficulty finding dedicated frameworks for fruitful production. The ART4MED project intends to foster these encounters between art practices and biomedical health research— All in a rapidly changing societal environment, under the influence of big data, material and technical innovation. It addresses the exclusion of marginalised groups from healthcare, global migrations, collapses in environmental health and the need for radical care in these pandemic times.
Activities and methodology	To experiment and disseminate collaborations between hands-on medical humanities and investigative art methodologies, in 2021 and 2022, the consortium will propose five residencies, five symposiums, talks, co-creative methodology workshops, online collaborations, hands-on sessions, exhibitions, and a final publication and festival in Paris. Several residencies are still ongoing. An example is provided by '**m/other: arts of repair'**, that looks at the potentials for artistic approaches to open up public conversations around reproductive justice and mental health. The project is situated within an abandoned hospital ward in an otherwise functional psychiatric hospital and is housed by the Center for Arts and Mental Health – an organisation that works with implementing artist-led workshops and creative writing groups within the psychiatric system as alternative routes to recovery. During the residency, artistic and public interventions in the hospital space such as performances, workshops and public talks are organised. The aim is to **facilitate encounters between artists, patients, health care professionals and the general public**, which will result in various co-produced texts and other artistic materials to be disseminated and made public within hospital and research settings. The methodology used within the project is based on the Collaboration Toolkit developed through STARTS projects and interdisciplinary residencies in last five years and OpenSource Hardware framework developed through the ongoing OpenNext project. What is interesting to note is that **the whole methodology revolves around the importance of establishing solid collaborations**. In a first step, the **collaboration**, **point of departure** and **targeted goals** of the residency are defined. Based on that, collaborators outlay the Residency Journey, which functions

	as an overview of **resources, activities and tactics** required through different phases of the research or innovation efforts. This will serve as a **shared overview of planned activities** while pointing out **pathways of specific residencies** as well as more **particular needs** of each residency. Residency Journey will be updated once during the residency if plans change due to the project development. By the end of the project, all Residency Journeys will be presented visually overlaying each other, identifying commonalities between them, pointing specific focuses and especially highlighting trajectories of art-driven innovation. A visual overview of the methodology is available here: https://art4med.eu/methodologies/.
Challenges encountered	The ART4MED program started in November 2020 within a new wave of the **COVID-19 pandemic**, forcing activities to switch to an online format, thus lacking the creation of the social link essential for the establishment of a cooperation that will then be more remote. The kick-off meeting and symposium was filmed and is documented here: https://vimeo.com/575995978 The residencies were, on the whole, able to be set up correctly, although some **medical institutions were difficult to access** during the period of hospital tension. This was notably the case for ART2M (Makery media for labs - Art2M (https://www.makery.info/en/) at Echopen at the Hôtel-Dieu in Paris, some of the residency activities were moved to other partners, but some of the working sessions were still possible, in particular on the testing of ultrasound phantoms in biomaterials. The only issue that Waag was confronted with was the **access to genetic research labs** for artist Adriana Knouf to practically work on her research. Due to the Covid-19 restrictions, lab access was allowed only for the university personnel. With such obstacles, the artist adapted her effort from multidisciplinary collaboration toward multispecies one and engagement with the transgender community in Amsterdam. Previously scientific focus shifted more toward socio-environmental one. Due to COVID-19, the Laboratory for Aesthetics and Ecology in Denmark LABAE (http://www.labae.org/) faced some logistic

	difficulties in inviting the chosen artists to stay in Copenhagen for a longer period of time. They also faced difficulties in conflicting schedules. As almost all cultural events had been cancelled due to COVID and rescheduled to take place in 2021, Luiza Prado and Edna Bonhomme had to withdraw as main artists-in-residence for this project due to too full schedules. As a solution, local artist and researcher Nazila Kivi was invited into the project, and the overall frame redefined as a collective endeavour, where LABAE curated various artistic and discursive interventions in the hospital spaces where Center for Arts and Mental Health resides. Prado and Bonhomme are still part of the project. However, their practices are no longer the focal point of the residency, but part of a collective endeavour and conversation between artists, doctors, patients and curators. For KERSNIKOVA the plan for the residential project was to carry-out a majority of the residency remotely, predominately due to COVID restrictions, but also due to the fact, that the production phase of the project ran almost through the entirety of the residency, and it would financially not be feasible. The physical part of the residency in Ljubljana was planned for October 2021, but had to be postponed for one month until November 2021 as it panned out as an optimal month for most people involved in the project. By the end of the physical residency, they were able to showcase the project and have a project presentation, but the envisaged discussion and workshops were not executed at that time, due to COVID restrictions at the time, which hindered physical events in cultural institutions to a great extent. No further challenges were detected at the level of collaboration between various actors, (artists, researchers and medical staff).
Principal results and impact	The project is ongoing therefore final results are not yet available.
Sources	

- Project website: https://art4med.eu/about/
- A mapping of makers' mobility schemes, curated and produced by European Creative Hubs Network in the context of the Makers' eXchange (MAX) project

- Article ‘ART4MED: a 2 years program where “Art Meets Health and Biomedical Research” ‘: https://www.makery.info/en/2021/03/12/art4med-un-programme-de-2-ans-ou-lart-rencontre-la-sante-et-la-recherche-biomedicale/
- Written exchange with the consortium
- kick-off meeting and symposium: https://vimeo.com/575995978
- Open Source Body website gives visibility to ART4MED: http://www.opensourcebody.eu

Case study 6	
Key data	
Title	EUROPACH - Disentangling European HIV / AIDS Policies: Activism, Citizenship and Health
Type	Temporary project
Timeline	2016-2021
Country	Countries under investigation: Germany, Poland, Turkey, UK, and the European level Countries participating in the consortium: Germany, Poland, Switzerland, UK
Project funders	The project was financially supported by the HERA* Joint Research Programme 3 ‘Uses of the Past’ which is co-funded by several national and international institutions, including the European Commission through Horizon 2020. *HERA, Humanities in the European Research Area, is a partnership between 26 Humanities Research Councils across Europe and the European Commission.
Promoter / lead partner, other partners and beneficiaries	
Partners	The consortium brought together researchers based in **four European universities** – Humboldt University in Berlin (Institute for European Ethnology), Goldsmiths, University of London (Department of Sociology), University of Basel (Department of History) and Jagiellonian University (Institute of Sociology). This network was constructed to provide **complementary theoretical and methodological knowledge from various scientific disciplines and areas of research**.

	Apart from the consortium partners, there were 14 associated non-academic partners, serving as advisors and experts during the research process.
Intervention logic	
Stated objectives of the project	Rates of HIV infection and the resources available for prevention and treatment vary considerably across Europe. These differences are shaped by variations in political processes and policy developments. The project explored the **relationship between past developments** – such as elaborations of local health policies and the building of community-based networks – **and current conditions of care provision and concepts of citizenship throughout Europe**. It investigated the extent to which, and terms under which, community groups and civil society representatives have influenced HIV/AIDS-related policies in Europe, as well as the ways in which these individuals and groups come to understand themselves in relation to earlier forms of policy negotiation and contestation. The project focused on HIV/AIDS "policy worlds" in Germany, Poland, Turkey, the UK, and at the European level. Investigating "policy worlds" means analysing not only policy instruments, but also the practices of policy development, negotiation and contestation. As these national cases have each had a different relationship with the European Union and other Europe-focused projects, they have been selected to understand and grasp "Europe" and the notion of "citizenship" as shifting and thereby unstable entities.
Role of the arts	As part of this research, **artwork was used as materialised forms of knowledge, and as reflective commentaries on HIV/AIDS policy worlds**. It was an **effective form of documenting and communicating individual and group experiences** as part of knowledge exchange activities. Arts-based processes and the unique ability of artists to rethink and translate visually complex problems led to the development of (long-term) outputs that are intended to help contribute to the development of new policy strategies to counter the continuing severity and spread of the HIV/AIDS epidemic. Complex issues such as sex work, the status of prisoners and refugees, human rights, and the perspectives and experiences of people who use drugs were investigated via video and audio recorded oral history interviews conducted by researchers and forming a significant

	part of the newly constructed online European HIV/AIDS Archive (see below). Researchers also assembled an archive of HIV-related artworks from Europe, which has been made available for wider use and continued expansion via the project's website (http://europach.phils.uj.edu.pl/project-outcomes/european-hivaids-archive/artwork-3/). Together with selected commissioned works, exemplary and incisive examples from these archives were put on display in a closing exhibition that was put on display in Berlin, Warsaw and Istanbul (http://europach.phils.uj.edu.pl/project-outcomes/) and helped to inform the development of research publications and a policy brief, both of which continue to serve as a basis to inform policy. These humanities and social science collaborations with artists in the form of discussions and exhibitions make evident how arts-based processes and competencies can be **crucial to conveying (co-created) knowledge towards policy makers and civil society.**
Activities and methodology	The project **analysed HIV/AIDS policy frameworks** to pull out underlying entangled logics from across Europe to understand how the past informs contemporary policies and concepts of citizenship. Oral history interviews, together with participant observation, were conducted with persons involved in HIV/AIDS-related activism, policy implementation, in spaces that make up HIV/AIDS-related "policy worlds". Researchers carried out ethnographic research and thereby have: • examined HIV/AIDS policy frameworks; • examined the logics of policy discussions, implementation and contestation, and the transnational histories that have been involved in the co-production of these policies; • developed a corresponding interactive map; • assembled and analysed an online archive of HIV/AIDS-related art works emerging from European contexts; and • recorded interviews with long-term activists and persons living with HIV or AIDS, which provided a foundation for a new European HIV/AIDS oral history archive.
Challenges encountered	A first challenge relates to the **collaboration between the academic partners and the non-academic organisations and individuals**, the so-called Associated Partners (APs). Although

	the relationships between researchers and APs varied from case to case, AP input was vital in all fields of investigation. Challenges emerged, however, in accounting for and working towards these groups differing primary interests, namely research versus advocacy. The scientific perspective is contrasted by the strong practical orientation of many associated partners. Nonetheless, in all cases, partners found productive routes for identifying overlapping interests, and producing outputs that reflected these interests, such as by publishing HIV/AIDS activist oral history books with excerpts from conducted interviews in Turkey, Poland and on the European level. The second issue regards the **different time horizons and the short-term nature of research** associated with project funding, which contrasts with the APs' way of working and with traditional ethnographic methods that are not dependent on temporary external funding – both of which are often much more long-term. There is much room for additional scientific and artistic engagement with the data, but the short-term nature of this funding hinders such possibilities. Another challenge was related to the **language**. The widespread academic use of English tends to exclude those who cannot express themselves fluently in this language. This was even more relevant if we consider that the project's target groups were mainly marginalised groups. However, the use of artistic media was a useful strategy that was often able to transcend these linguistic barriers.
Principal results and impact	In order to illustrate the local and transnational histories that have come to shape existing policy worlds, the project developed an interactive map and an archive of the history of HIV/AIDS in Europe. Together with a range of scholarly publications, including a special issue in the academic journal Critical Public Health (europach.phils.uj.edu.pl/project-outcomes/library/library-2/), the **European HIV/AIDS Archive** (EHAA; the Archive rs.cms.hu-berlin.de/ehaa/pages/home.php) is a significant and tangible output of the project that was **co-created together with artists, especially camerapersons, editors and videographers**. It is a living collection of narratives of the past, present, and imagined futures of the HIV/AIDS epidemic. It brings together a multiplicity of oral history interviews accompanied by virtual copies of policy documents, community reports and leaflets, HIV/AIDS witness seminar transcripts, art works, and other historical materials. The

	archive is intended to help contribute to the development of new strategies to counter the continuing severity and spread of the epidemic. The research findings and outputs have **important policy implications for citizenship models** that are observable in relation to HIV/AIDS policy worlds in Europe, inform the cataloguing of problems that arise in the landscape of European citizenship, and routes for improvement in terms of health, rights and responsibility, as well as new directions for policy, care provision, activism and advocacy in the fields of health (especially HIV but also TB, Hepatitis and other STIs), migration, sex work and drug policy.
Sources	
• Project website: http://europach.phils.uj.edu.pl/ • HERA Website: https://heranet.info/projects/hera-2016-uses-of-the-past/disentangling-european-hivaids-policies-activism-citizenship-and-health/ • EHAA-Website: https://rs.cms.hu-berlin.de/ehaa/pages/home.php • Article 'A Living Memory of HIV/AIDS Activism in Europe': https://issuu.com/galeriamiejskaarsenal/docs/creative_sick_states/s/12407080 • Article 'Project-making and discourse imperialism instead of cooperation and innovation? Some re-flections on my experiences in the European research area': https://www.worck.eu/2021/11/18/project-making-and-discourse-imperialism-instead-of-cooperation-and-innovation-some-re-flections-on-my-experiences-in-the-european-research-area/ • Article 'Reibung als Potential. Kollaboratives Forschen mit HIV/Aids-Aktivist*innen': https://www2.hu-berlin.de/ifeeojs/index.php/blaetter/article/view/1085 • Informal exchange with the project funders (HERA network) • A written exchange with the project leaders	

Case study 7	
Key data	
Title	Prosthetic X: an 'Artificial Data Organ'
Type	Ongoing project (started in 2019)
Country	Netherlands

Budget	€125,000
Project funders	The project received funding to create prototypes, develop the first concepts and organise a series of prototyping exhibitions in the Netherlands. Initial funding came from the **Creative Industries Fund Netherlands**. The spill-over projects receive different funding (public innovation funding and private funding).
Promoter / lead partner, other partners and beneficiaries	
Partners	The project is a collaboration between **Studio Isaac Monté and In4Art.** Isaac Monté's work focuses on social sustainability, material design and scientific research. In his work he explores and shows show how art can contribute to the development of sustainability). **In4Art** is an innovation production organisation creating room for experiments at the intersection of art, science and technology and developer of the Art-Driven Innovation as method to realise responsible innovations and strategic implications.
Intervention logic	
Stated objectives of the project	The project stems from the question 'How might we increase health and beauty on the outside?'. It resulted in a technological 'Artificial Data Organ' that is strongly reminiscent of a natural organ, with **prostheses that serve as aesthetic indicators for the functioning or non-functioning of (parts of) the body**. It consists of nine interactive prosthetics, designed for specific locations on the head and hands, that respond and adapt in real time to our inner health, external condition and social interactions. A series of body extensions that live, breathe, move and change colour, like the organs in our body giving intuitive feedback. They change by responding to personal social data, health data and external measurements. The 'Artificial Data Organ' is brought together in a speculative movie. In addition, there is a tenth prosthetic: the exo-organ, which can stand with a loved one or caregiver. This indicates the "status" of the other nine, allowing dedicated others to gain insight into the health of the wearer from a distance. Next to that, Data Donor Register is elaborated, to also take into account the data privacy considerations related to this development. A final development is the creation of a wearable prototype, combing the research and insights from three of the developed prosthetics and bring that to the human scale.

Role of the arts	Artists, scientists, companies and citizens collaborated to create prototypes and new concepts. The **involvement of the arts starting from the scoping process and throughout the creation phase inevitably led to the involvement of the arts in the valorisation phase** itself as the knowledge/output produced already benefited from the artistic competencies. Furthermore, the valorisation process (which consisted of an exhibition, presentations and new research projects) has been interconnected with the scoping and creation process, proving that **knowledge flow is not a linear process**. A series of prototyping exhibitions have been organised in The Netherlands, where **visitors became part of the process** and could participate in design choices. A series of workshops were organised to receive feedback on smaller elements. As a general outcome, visitors could experience a 10-minute immersive installation, which exists of a series of 10 interactive prosthetics, a speculative scenario movie and the Data Donor Register**. The research team used this feedback for further development. After two years, 10 different objects that monitor aspects for vital health were produced and are all designed in such a way that beautifies humans. The arts made it possible to explore health tracking tools that not only are not invasive, but also empower empathy**, celebrate knowledge and combat the threat of loneliness, isolation and health conditions for an aging population. The whole installation is available here: https://prostheticx.eu/installation/
Activities and methodology	**The research questions and methodology were built on the Art-Driven Innovation method developed by In4Art, which is already consistently used in the context of their activities and projects.** The method is developed to generate ideas and include the insights from artistic experiments on technological and social domains to achieve more responsible innovations. It is about combining breakthrough technologies, sustainable development goals and artworks, thereby creating a new **playing field for open innovation and strategic decisions**. It is based on the view that economic and social progress should be regenerative and distributive to contribute towards a greener care path for innovation.

	One of the key research methods used was the **involvement of citizens starting from the scoping** phase in special prototype labs**.** Several physical and digital workshops were held for various purposes: • to make the audience experience how social interaction based on shared interests during a serendipity encounter results in in-depth, pleasant conversations. With this experiment, the research team gained insight into the overlap between different generations and ways to increase empathy & combat loneliness; • to share ideas regarding the readability of Prosthetic X, during which Isaac Monté gave an anatomical demonstration and showed the envisioned locations for Prosthetic X on the body. The feedback of participants was incorporated in the research and co-digested by scientists and artists to come up with new findings and adapted solutions.
Challenges encountered	The project was ambitious from the start and needed to be broken down into small parts to be developed and find the right partners and funds. At the same time, there has been a continuous parallel trajectory between the anticipated future, where the wearable prosthetics would be worn on the body and the development of the prosthetic objects on a 40-x40cm scale. Due to the time constraints, the Covid-19 situation gave a lot of uncertainty related to public engagement possibilities and also where and when to present the installation.
Principal results and impact	As explained above, the realisation of the physical outputs and the investigation of the topic could not have been possible without the equal collaboration with an artist throughout the entire knowledge creation process. This involvement, along with the continuous and meaningful participation of citizens throughout the entire investigation, led to **a sense of co-ownership and to an enhanced valorisation of the final output**. To really empower and enhance relationships and show new opportunities of interaction with the *Prosthetic X*, collaboration was key. Beyond the physical output, one of the main results of the project was the **establishment of strong collaborations between scientific, technological, artistic partners and citizens** to experiment and create awareness and opportunities.

Sources
• Project website: https://prostheticx.eu/ • In4Art's Art-Driven Innovation methodology: https://artdriveninnovation.eu/ • Informal exchange with one of the practice providers • https://www.sidnfonds.nl/projecten/prosthetic-x • https://www.stimuleringsfonds.nl/projecten/prosthetic-x-gamification-voor-gezondheidswinst

Case study 8	
Key data	
Title	Ljudmila
Type	Permanent organisation
Country	Slovenia
Funding model	The main sources of revenues are: • membership fee, • public funds and other grants • donor contributions, • sponsorship income, • gifts and bequests, • funds from material rights and activities of the association. National arts funding (via application) is one of the main financing sources, where EU funding complements the public grant. At the moment, Ljudmila is involved in two Creative Europe projects: the large-scale project EASTN-DC and the small-scale cooperation project On the fly. In addition, there is also a third source of funding at the moment, namely a special two-year project partly funded by the EU and involving several organisations in Slovenia. The project is called 'konS ≡ Platform for Contemporary Investigative Art' and it has been chosen in the context of the nine million EUR public call for the selection of the operations "Network of Investigative Art and Culture Centres". The investment is co-financed by the Republic of Slovenia and by the European Regional Development Fund of the European Union.

	Ljudmila was originally located in a space outside the city of Ljubljana, but due to challenging financial viability, they moved to the city centre for 11 years. This location was then sold by the city, so the organisation moved to a new venue in a business tower. As of 2017, Ljudmila shares the 8th floor of a skyscraper in the centre of Ljubljana with two other similar NGOs, the Delak Institute and the Projekt Atol Institute. Together, they work on running it as a multifunctional venue for new media art and contemporary theatre, called Osmo/za. The costs of the public space and the workshop area are fully shared. The floor is owned by the city, while the building by private owners. Ljudmila is recognised as an 'organisation of public interest' by the Slovenian law (special status), thus having the right to occupy this space without paying rent.
Keywords	arts and technology, digital literacy, media art
Mission, stakeholders involved and beneficiaries	
Vision and mission	The original idea of Ljudmila is dated to 1994 when a group of media artists teamed up with the aim to connect art and technology. They founded Ljudmila - Ljubljana Digital Media Lab programme of Open Society Institute Slovenia (since 1994, at that time they joined this local arts associations as a programme). They started with **exploring the links between arts and technology**, internet and the web and with **establishing a connection with the Slovenian academic networks, and Slovenian cultural and NGO scene**. Ljudmila Art and Science Laboratory was established in 2010 as a successor to the Ljudmila - Ljubljana Digital Media Lab programme of Open Society Institute Slovenia. It strives to **connect research practices, technologies, science, art and civil society**. It engages in the development and popularisation of open culture, free licences and software, and in new ways of distribution. It detects **how communication transformations affect society and encourages innovative art practices**. From 2011 Ljudmila acts as a public lead of Creative Commons Slovenia. Ljudmila also has an **educational mission** consisting of familiarising artists with digital technologies and research connected to technology.
Team	The Ljudmila Art and Science Laboratory was established by 10 new & all media artists, developers, hackers, programmers, and computer engineers engaged in the Ljudmila - Ljubljana Digital Media Lab.

Intervention logic	
Activities	Ljudmila's programmes are rather diverse and wide-reaching. It conducts collaborative research, runs the art&hacking meeting PIFcamp and organises residencies and open workshops on the uses of open source software and on making do it yourself (DIY) technological hacks. At the same time it supports the production of new media artworks, among others. Since 2011 Ljudmila develops and publishes the Culture.si portal for international cooperation, in 2013 the Kulturnik.si (a metasearch engine and the cultural news and events aggregator) was launched. Both portals have been funded by the Slovenian Ministry of Culture. • **Educational programmes**: Ljudmila organises regular open courses, workshops and public lectures in basic and advanced use of open-source software, led by new media artists. The workshops usually feature various modes of "tinkering" with electronic circuits and technology in general, hacking and re-imagining it with the help of free software ("home-made synths" and "wearable electronics" serving as a typical example). The participants are encouraged to search for further uses and include the findings in their artistic work. Since 2013, Ljudmila has been developing its education programmes together with the Projekt Atol Institute. This line of activities has, as a main target group, local emerging artists and creatives, but also businesses and non-governmental organisations. • **Art projects and residencies**: Ljudmila's artistic endeavours usually fall under new media art. It focuses on young artists, offering them technological and other support for their productions (some of which have been nominated for the STARTS Prize – the Grand Prize of the European Commission honouring Innovation in Technology, Industry and Society Stimulated by the Arts). The laboratory also organises artist residencies, inviting and hosting one artist from abroad per year. A specific activity is the PIFcamp, which was set up in 2015, and is a 7-day nomad maker-base set in the Slovenian nature, where art, technology and knowledge meet. Hands-on workshops, presentations, field trips, artistic explorations and random gadget tinkering take place in a context of collective research and creation. Participants are assisted by experienced local and international guests from different fields.

Since 2009 Ljudmila also runs one-month-long residencies, whose main objective is to provide insight into the entire process of creating artistic works in the field of new media art. The interested public is, through direct contact with guest artists (workshops, informal meetings, and lectures), involved in specific know-how transfer, exchange of ideas and a variety of artistic practices between the artist and the audience. The audience is represented by artists, businesses, but also NGOs and citizens interested in these topics.

- **Collaborations**: on behalf of the Ministry of Culture, Ljudmila ran two web portals in the period 2009–2020: Culture.si, which offers information on Slovene cultural producers, venues, festivals and support services, all in one place and Kulturnik.si, a digital aggregator and search engine for all things (Slovene) culture.

  In 2013, Ljudmila Art and Science Laboratory was invited by the Ministry of Culture to collaborate with the National and University Library and Archives of the Republic of Slovenia and organise a line of discussions related to the Digital Agenda in the Field of Culture in order to identify the issues and outline basic standards and recommendations for a common strategy. The working group led by Ljudmila focused on data accessibility, while the other two groups discussed the processes of digitisation and permanent data preservation. Ljudmila also regularly cooperates with industrial partners.

  Ljudmila has also been collaborating with the Slovene Museum Society, organising discussions on museums and the web. It advises art institutions on web design, manages the server infrastructure for various NGOs, and is generally interested in the developments of digital politics and policy.

  A special collaboration is the one established in the context of the **konS – Platform for Contemporary Investigative Art**. The project aims to establish better conditions for the maintenance and development of contemporary investigative art in Slovenia. Activities in konS are, in content and in structure, aligned with the establishment of the latest investigative, research, design and engineering institutions (future/solution labs) that will enable the production of high-end contemporary investigative art and the translation of visionary art ideas and inventions into economy and forward-thinking society. The goal of the project

	is to establish systemic connections between idea creators, inventors and engineers in order to create solutions for a more inclusive society while building information and education systems aimed for different social groups that will be empowered for critical use of new technologies. All art and education programmes are supported by the Slovene Ministry of Culture (in the co-production with Projekt Atol Institute) and MOL – Department for Culture.
Challenges encountered	In general, Ljudmila observes a **scarce awareness within the industrial context of the importance of the arts** and specifically of media arts **for research and innovation purposes**. It is new for business to hear about art thinking. Very small budgets are often offered to collaborate. Collaboration is, in general, challenging. **Cooperation with universities and research institutes** is also challenging as budgets are small, so the organisation tends to cooperate with single researchers and scientists who are willing to collaborate with artists. Another challenge is represented by the policy context. **Policy domains are very compartmentalised**, which means that although there is funding for the arts, very rarely is there funding to stimulate interdisciplinary connections with few incentives to collaborate. Also, the **requirements of the calls are often not adapted to the arts context**. Rather, impact is measured on the basis of the number of productions, events, people engaged, etc. In addition, there is no real public institute at national/regional level focusing on art and science/ technology. As a consequence, lobbying is highly needed to push policy makers to develop innovative funding programmes.

Principal results and takeaways for learning	The main achievement of Ljudmila is to creatively **connect the artistic, scientific, technological, research and civil society spheres.** The organisation regularly contributes to the understanding of the importance and popularisation of open culture, free licenses and programs and new ways of distribution, to discover the social impacts of communication transformations and to promote new artistic practices. Ljudmila actively **establishes contacts and cooperates with institutions, companies, informal groups and individuals** working in the fields of ICT with the purpose to generate new research and innovation, but also public awareness of these topics, by encouraging broader, savvier and more creative uses of new technologies. Ljudmila considers it vitally important that artists engage with various individuals - researchers, programmers, designers, technologists (and more), to develop a platform together. In this respect, Ljudmila also developed a **methodology for art as an innovation catalyst**, in the context of projects where they collaborated with small businesses to solve a specific common need, by testing and prototyping. Linked to this, an innovation future lab will be developed where businesses can familiarise themselves with and access these methodologies. However, it should be noted that this methodology is not developed together with the industry. The general principle followed is an **"open door policy".** This means that they are strict in using open technology and open sources, but also that art programmes are not produced in a stand-alone practice, but they are rather **community facilitation processes**, targeting local emerging artists and informal groups who want to co-learn in workshops and laboratories. An example of this process is the installation Theremidi Orchestra (TO), the results of a community process initiated during physical workshops. Rather than a subject, TO is an ongoing workshop of noise and drone production. TO is a process of mutual understanding and solving problems in a horizontal manner. The process of production involves experimenting with sound outputs, mutual composition of music scores, shared responsibilities for individual parts of the process, etc. Another example is the light sound installation 'Cosmic Rain' that hosted, informal groups including, among others, physics students and citizens. They were very enthusiastic about the installation as "*they were seeing what they actually learn in theory at university*". The organisation also contributes to the **demystification of the arts**. When working with artists and audiences, they do not try to hide the engine and the principle/process behind, but rather to emphasise it.

	By showing audiences technology and science, they are raising awareness, and increasing knowledge and understanding of complex matters (i.e., *opening the black box*). As part of the konS project, Ljudmila contributes different content within the three **Laboratories for innovations**: artificial life, robotics laboratory, and laboratory for distance perceptions, sensor networks and signal processing. In the framework of the latter, Ljudmila contributes to projects that are developed with external collaborators, be it from science, business and art field.

Sources

- Organisation website: https://wiki.ljudmila.org/Main_Page
- Interview with the director of Ljudmila
- Video presentation: http://kuda.org/en/node/420
- Article with interview with Luka Frelih, director of Ljudmila
- Article 'Ludmila, a pioneer in the field of digital technologies'
- Article 'MCRUK – Mreža centrov raziskovalnih umetnosti in kulture / Network of Investigative Art and Culture Centres'
- About us – konS (kons-platforma.org)
- Tilen Sepič : Cosmic Rain (ljudmila.org)
- https://www.culture.si/en/Ljudmila_Art_and_Science_Laboratory#External_links

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct centres. You can find the address of the centre nearest you online (european-union.europa.eu/contact-eu/meet-us_en).

On the phone or in writing

Europe Direct is a service that answers your questions about the European Union.
You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696,
- via the following form: european-union.europa.eu/contact-eu/write-us_en.

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website (european-union.europa.eu).

EU publications

You can view or order EU publications at op.europa.eu/en/publications. Multiple copies of free publications can be obtained by contacting Europe Direct or your local documentation centre (european-union.europa.eu/contact-eu/meet-us_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex (eur-lex.europa.eu).

EU open data

The portal data.europa.eu provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

This study investigates the role(s) that arts and cultural organisations can play in fostering knowledge valorisation for the benefit of society, and how European valorisation policy can contribute to strengthening the impact of the arts and cultural organisations in knowledge valorisation processes.
Based on a literature review and interviews, almost 100 inspiring practices, as well as eight in-depth case studies, it shows how the arts and cultural institutions in Europe already participate in knowledge creation and valorisation processes, and take up different roles to better connect research with society. The study also highlights the main barriers that currently limit arts and cultural organisations from realising their full potential contribution in fostering knowledge valorisation. Based on the findings, the study formulates recommendations on how the European Commission can further improve the conditions in the EU to tap into the potential of the arts and cultural organisations for increasing the impact of knowledge valorisation arising from research.

Studies and reports

Publications Office
of the European Union