



## NEM Interactive and Immersive Content (I<sup>2</sup>C) Initiative Proposed Programme of Activities & Research

This document recommends a significant programme of investment in the development of content and technology for immersive and interactive experience (I<sup>2</sup>C) through the Horizon 2020 work plan. It has been prepared by NEM members following extensive consultation with industrial and academic partners in the film, television, games, arts, news, publishing, retail, transport, telecommunications, medical and manufacturing sectors.

The I<sup>2</sup>C initiative proposes new research and innovation actions to be undertaken by both small and large businesses at different points of the value chain in response to foreseeable technological trends and in anticipation of emerging user needs, to improve productivity and facilitate collaboration between sectors.

### **What is meant by Immersive and Interactive Content (I<sup>2</sup>C) and Technology?**

Media are increasingly pervasive in every aspect of citizens' lives: they are central to personal, social, democratic, and economic experience. Digital technology and tools are driving unprecedented, disruptive change in the ways we create, distribute and experience stories, making our engagement with information ever-more immersive and interactive. The trend towards electronic media becoming immersive media started with the advent of electronic communications in telecommunications and in entertainment. Audio started out as a limited-quality monophonic signal, and migrated from stereo and HiFi to 5.1, 7.1, 22.2; spatial and object based audio coding turned into an immersive experience. In video, resolutions have increased, the third dimension was added to the two-dimensional image with successful applications in cinema and more recently with heads-up stereo displays, and Ultra High Definition video is being developed to add more realism parameters beyond just the spatial resolution. The amount of media sensors is increasing dramatically, and so does their quality and level of connectivity. At the same time, "actuators" are becoming equally pervasive: screens increase in size and improve in quality; audio feedback is omnipresent and technologies that allow reproduction of arbitrary audio scenes, once computationally prohibitive, are becoming available as well. Haptic feedback is also starting to be used in games and beyond.

In this document 'Immersive and Interactive Content' refers to computer-generated simulation of reality with physical, spatial and visual dimensions. Such 'virtual reality' systems can simulate everything from a walk-through of a building prior to construction to simulations of aircraft flight to the operating theatre to new three dimensional forms of interactive entertainment. Immersive technologies and virtual reality are powerful and compelling computer applications by which humans can interface and interact with computer generated environments, and each other, in a way that mimics real life sense engagement. Although currently mainly known for consumer applications in the entertainment industry, the real promise lies in such fields as medicine, science, engineering, oil exploration, data visualization and the military to name just a few. As 3D and immersive technology becomes more integrated and accessible for a wide range of applications, it will require well-designed user interfaces and innovative content across interoperable platforms including mobile devices, distributed web systems and desktop applications.

These advances in the tools with which we craft and consume content are accompanied by changes in entertainment forms, in the grammar, syntax and genres of storytelling, in the frameworks in which information is organised. At the same time, the relationship between author and reader, between artist and audience is increasingly becoming one of interaction, participation and co-creation. As much as new entertainment formats are shaped by the emergence of new platforms, technological innovation is driven by the imagination of artists and the behaviour of audiences. It is a core principle of this initiative to explore ways of uniting technical and artistic research and development.

It is the purpose of this programme proposal to be as inclusive and open-minded about what immersive content and technology of the future will be. In this proposal we intend any immersive experience and all human senses to be included – not "just VR headsets" or "AR glasses". In fact it is probably better to view the terms of VR and AR in a more general sense. i.e.

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VR being a virtual environment which can be viewed by any kind of future device; whereas AR is a real or live environment over which CG is virtually mixed or overlaid. These environments can be viewed or experienced in a variety of ways.

### Overall Business Case & Impact

The adoption of digital technologies continues to drive a revolution in the way consumers interact with each other and engage with the companies serving them. The next ten years will see the rapid deployment of new platforms and devices for telling stories, providing entertainment, news and information, selling goods, delivering advertising, and a wide range of business and consumer services. As the technology advances and price points decline, an entire new marketplace of immersive and interactive applications (both business and consumer) will hit the market. The number and range of digital connected devices is also increasing. Wearable technology, such as smart fitness wristbands and watches, as well as connected devices for the home such as smart appliances and smart TVs are all increasing in popularity, although many remain niche products for now.

The recent World Economic Forum at Davos focused on key technology disruptors that would drive the “fourth industrial revolution”: amongst them was Virtual Reality (alongside the Internet of Things, robotics, 3-D printing, cognitive technology, biometrics and faster connectivity). In January 2016 Goldman Sachs Investment Research projected that “VR/AR has the potential to spawn a multibillion-dollar industry, and be as game changing as the advent of the PC”<sup>1</sup>.

Deloitte, in its report *Digital Predictions 2016*, also singled out Virtual Reality as one of the most significant emerging technologies, saying: “Virtual reality may still be in the early stages of its commercialisation and development, but it has reached a pivotal point. Deloitte predicts that 2016 will be the industry’s first billion dollar year”<sup>2</sup> The report was careful to point out that the technology and its applications are still in its infancy: “Consumers are likely to reject applications of VR technology where the content or interface is not good enough and there are still a number of issues to be resolved with the technology. There are several usability issues with current VR technology that may in the long term offset the undeniable attractions of being transported to another time and place”.

As “immersive experiences” enter the mainstream market, both the content and technology industry are changing so rapidly that it is crucial for Europe to develop and implement strategies in order to “keep pace with the up-to-date trends and remain competitive”<sup>3</sup>. While the EU, especially through the designing of the H2020 Program, has demonstrated its willingness to build on the opportunities that digital disruption has brought to the media and content industries, European businesses have an ever-growing range of challenges to face, resulting from the combination of rapid developments in technology (VR, AR 3D) and changing consumer behaviour. Navigating this shifting landscape and translating these developments into compelling user experiences and profitable market opportunities becomes ever more challenging.

It is inevitable that many of the key platforms and technology for the delivery, development and distribution of immersive experiences are being developed in the US or the far east by companies such as Microsoft, Google, Sony and HTC. In addition to Facebook’s acquisition of Oculus Rift and Google’s development of both platforms and content, for example, the Florida-based AR developer Magic Leap has recently raised \$793 million from investors including Chinese e-commerce giant Alibaba, Warner Brothers, and financial institutions including Fidelity and J.P.Morgan.

Without support there is a very real danger that European content and software developers will struggle to compete in developing content, applications, software, architectures, technologies and standards for a market predicted to be worth \$150 billion by 2020<sup>4</sup>. The proposals in this paper for significant European investment in Immersive and Interactive Content (I<sup>2</sup>C) as part of the European Commission’s Horizon 2020 programme are designed to address that challenge.

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<sup>1</sup> Goldman Sachs Global Investment Research

<sup>2</sup> Deloitte Consumer Review: Digital Predictions 2016

<sup>3</sup> H2020 ICT-19-2015 Call, Topic “Technologies for creative industries, social media and convergence”

<sup>4</sup> Digi Capital – Augmented/Virtual Reality Report 2016

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### The I<sup>2</sup>C initiative

The I<sup>2</sup>C initiative will provide support in three main areas: *Content Generation, Content Distribution & Processing, Content Visualisation & Interaction*. It will assist both small and large businesses at different points of the value chain to respond to and anticipate emerging user needs, to improve productivity and facilitate collaboration between sectors. The actions proposed in this initiative aim to enable European developers of content and software to create richer, more realistic, more productive and more engaging user experiences, applicable to all environments in which people use and interact with media: at home, at work, in social, commercial and personal contexts.

This proposal's **main objective** is to enable Europe's creative, cultural, media and content industries to provide innovative and engaging services to existing and new audiences across all aspects of life. For this, it aims to:

- Make Europe the global centre of excellence for immersive media production
- Enable European industry to develop, manufacture and sell networked systems for immersive applications.
- Develop open platforms for collaboration on the development of immersive media services and content for creative industries and for any vertical sectors

The actions are intended to facilitate the development of significant knowledge and technologies to support this vision, in support of the Strategic research agenda. The programme also recognises that innovation and growth in the creative and cultural industries is driven by an intricate relationship between content and technology. It will be a core principle of the programme to encourage collaboration between artist, scientist and engineer, to deliver societal and cultural benefit as well as commercial growth. It will also acknowledge the potential for crossover between the creative industries and other sectors of the economy. Tools, approaches, ways of thinking and business models established by creative businesses can be exploited in other sectors to develop new products and services – and vice versa. Such links can be found at the very forefront of innovation – for instance, the development of 3D visualization techniques in medicine and engineering.

The proposals in the I<sup>2</sup>C initiative are consistent with other projects and PPPs in the ICT area. They would take advantage of the results of programmes such as Vertical use cases, NGSI APIs, IoT broker, Content storage, Content search, Content analysis, Network configurability, E2E QoE, Latency and other areas.

### I2C and Standards

Many standards are already in place that support the immersive and interactive content value chain, although there may be scope through these activities to influence further standards development or define groups of standards to support particular applications. For example, video compression is already covered by MPEG standards (with work continuing on improving compression efficiency), and some developments (such as multi-view video support) already provide functionalities that may be particularly useful for immersive content. New application areas may benefit from standardised ways to use these, such as specifying a standard efficient mapping for placing omnidirectional video into a rectangular video container. Many end-user applications are likely to run in browsers, requiring the integration of existing video & audio standards into a Javascript/HTML5 environment to allow interactive control and immersive rendering. Projects in this I<sup>2</sup>C programme could contribute to developments such as the WebAudio API in W3C, and help to drive the uptake of such standards across a wide range of devices by demonstrating compelling applications that they enable. There may also be scope for defining device profiles that group particular capabilities together, to make it easier for application developers to target broad classes of device rather than a highly-fragmented market.

With that in mind it may be that several of the activities below could contribute to such standards. In particular activity 3 looks well placed to do so and therefore this aspect is mentioned in the detail. This technology is also moving into an era of Any Time Any Where Any Device (ATAWAD) and will obviously need to support and enhance standards that support that viewing ideology.

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## Priority Considerations

An earlier draft of this document was presented as a proposal for a PPP to the NEM Steering Board Meeting and also the NEM General Assembly. At the NEM GA an exercise was undertaken that allowed attendees to respond to and discuss the priorities within a longer list of proposed activities. Delegates discussed the proposals in groups focussed around the following categories: *Content Generation, Content Distribution & Processing, Content Visualisation & Interaction* and *Coordination & Support Actions* (CSAs).

The activities in the current document have been selected as the highest priorities from the longlist based on the feedback from the General Assembly and Steering Board.

### **Content Generation**

- Activity 1 – Storytelling Creation for I<sup>2</sup>C
- Activity 3 - Content Generation Tools for I<sup>2</sup>C
- Activity 4 - Science, technology and arts in Immersive and Interactive Media

Summary:

Overall there was a strong feeling that a specific activity on storytelling is essential. Some additional points have been added to Activity 1 based on this feedback. Additionally, a STARTS type project (Activity 4) was also highlighted as key. At the early stages of developing the grammar, syntax and overall user experience of immersive media, R&D in this area was seen as essential to

- (a) enable risk taking;
- (b) correctly value the creative industries input into other industries;
- (c) work with existing programmes.

These calls should understand how best to support businesses (comparing with emerging business models) so that they can scale up, measure growth, success, impact and share IP.

### **Content Distribution & Processing**

- Activity 2 - Mixed content Immersive Technology

Summary:

The NEM GA felt the priorities should be to avoid “locked-in” solutions when it comes to processing or distribution of data. People also highlighted the risk of investing in technology that then loses its market appeal citing what has happened to the 3D film/tv market as an example.

In this category a lot of the concern is on particular technical challenges so that experiences are immersive as possible so that the market appeal lasts and delivers greater impact. People felt that Activity 2 addressed a potentially very large market and was a much higher priority than other actions that have been dropped from this proposal.

### **Content Visualisation & Interaction**

- Activity 1 – Content Generation: Beyond Entertainment Applications
- Activity 2 - Mixed content Immersive Technology

The most significant feedback supported that there should be calls for applications beyond the entertainment sector in Activity 1 and that Activity 2 would have a very large impact. (with the sectors affected most highlighted in the details).

There was also good feedback in terms of broader cross-technology and cross-sector considerations. One point was that interactivity, UI/UX and visual acuity support each other and are a broader experience than “just visualisation”. Another was the consideration in activities of geo-location influencing both content and experiences.

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### **Co-ordination & Support Actions (CSAs)**

- Activity 5 – Direct Support to Startups
- Activity 6 – Support to Intermediary Organizations

CSAs are now considered a much higher priority within the context that the proposal will not be a PPP. The suggested CSAs put emphasis on

- supporting European research spin-offs, businesses and start-ups, and,
- strengthening existing support structures at a local, regional, national and international level.

Through these measures I<sup>2</sup>C aspires to create cross-sectorial and cross-border synergies, and accelerate access to global markets for European ideas and technological solutions.

The proposed CSAs are intended to be applied “horizontally” throughout the programme, cutting across the different activities in the programme’s three pillars of content creation, processing and visualisation.

Summary:

The NEM GA provided substantial feedback in the *support actions* discussion and some clear recommendations were made for criteria for participation in the support actions, for example:

- actions should not just accommodate the needs of startups only but also provide support independent entrepreneurs
- particular attention should be paid to support for women entrepreneurs.
- end user experience should be a critical in designing the criteria for participation in the CSAs,
- a community of entrepreneurs and users should be involved in the setting of the standards.

International cooperation is the expected outcome of such an approach. The network of experts and mentors should be also actively committed in the program and be engaged to offering customised services.

In terms of coordination, it was suggested that previous experience like this of the FIWARE Acceleration Program, should provide a starting point and that I<sup>2</sup>C would build upon the know-how, infrastructure, networks and facilities of large industry accelerators including VC’s. Business sustainability factors should be set in order to achieve the long-term expected impact of the whole programme.

### Summary of Actions

The following is a list of potential activities that we propose for inclusion in future H2020 work plans.

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### **Time frame:**

It is envisaged the activities would start at earliest Q1 2018 with the overall set of activities running for 5-6 years with some activities starting later at different phases. Suggested dates for each activity will be added once those phases are more clearly defined.

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## List of Activities

### Activity 1 - Storytelling Creation for I<sup>2</sup>C

#### Summary Reason:

- This activity is to support European content companies to integrate technology in the development of new immersive experiences.
- It will enable content and tech companies to develop common spin offs/companies and access funding to accelerate their seed and growth phase.
- It aims to facilitate collaboration between content generators and tech companies through convergence of media.
- To drive new concepts in storytelling. Production and distribution of immersive content.
- It would support the development of applications in sectors outside of entertainment to present information in unique or previously impossible ways; these might include healthcare, construction, retail, training and education, etc.
- Call for projects and companies will be supported and disseminated through regional clusters.

#### Detail:

- Media generated from various sources (Games, Film, Arts, Broadcast, CAD etc) are finding overlap when content material for immersive systems is considered. This is leading to new concepts of storytelling, production and distribution.
- Across the EU there are emergent clusters of SMEs that are specializing in providing services to generate such content.
- Allows for generation of new concept in content creation and should address different verticals, advertising, entertainment, news, live and time limited experiences and new models of storytelling
- Includes creating content that is needed using existing technology to capture live-action cinematic content and the tools required to process that data and prepare it for use in an experience. Should include both large company and user-generated content.
- Includes Immersive Technology analysis of Big Data
- User testing of what content works/doesn't work including perception and cognitive studies to evaluate the impact on end users

#### Target Category:

- *Content Generation*

#### Target Sector/Companies/Research Institutions:

- Creative Industry (Film, TV, Games, Theatre, Arts, Music)
- Cultural Heritage
- Education
- News & Publishing
- Theme Park Entertainment

#### Impact:

- Provides framework for research and experimentation of content creation to deliver high quality convergent output by bringing together skilled creative parties.

#### Instrument Type:

- Innovation Action
- Estimated Call Size: 20-25 Collaborative small projects (Between SMEs) up to €1M
- Estimated Call Budget: €20-25M

#### Enabling Environment:

- Clusters already existing and functioning regionally
- Pan-european network of experts
- Public and private funds made available for start-ups

*Note:* The combined purpose of Activities 1 & 3 is to allow for a proposal that works regardless of the evolution of technology in the meantime. The point being that content created and technology created should be able to feed into or out of mainstream Immersive tech created in the coming years.

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## Activity 2 - Mixed content Immersive Technology

### Summary Reason:

- This is critical, it is as much a content generation problem as delivery / interaction, you need the authoring tools to be able artists to create the mixed content. This is the key activity for new content creation tools to allow authoring of Interactive Content.
- Includes 360 Content Creation and positional VR.
- The capture of a 360 environment so that a user can experience a photoreal environment remotely of a real/live location.
- By making sure a capture easier and faster to deliver it will open up fields of being able to virtually move around live events and locations in the world.

### Detail:

- Some forms of future Immersive Experiences will require production of content that mixes both live and CG rendered footage. Such an activity would address the processing requirements to allow for accurate stitching together of both times of footage potentially in real-time.
- It would also address the 3D positional needs of any immersed viewer via appropriate camera technologies.
- Consideration of audio is important to make sure experience is truly immersive.
- Activity would also include technology allowing of tracking of particular object types in either the CG or live content via machine-vision object recognition.
- Placement technology for advertisements.
- Conversion of content into an engine that allows for positional movement.
- Depth capture of environment.
- Processing of large amount of 3D data into deliverable amount to end user.
- Important for advertising industry. Application area education & active learning. News in real-time.

### Target Category:

- *Content Distribution & Processing*
- *Content Visualisation & Interaction*

### Target Sector/Companies/Research Institutions:

- Advertising
- Architecture
- Construction
- Creative Industry (Film, TV, Games, Theatre, Arts, Music)
- Cultural Heritage
- Digital Distribution Companies
- Education
- Medical & Health
- News & Publishing
- Retail
- Telecommunications
- Theme Park Entertainment
- Transport (Rail, Road, Air)
- Research Institutions developing immersive solutions

### Impact:

- Global Impact due high number of sectors interested

### Instrument Type:

- Research & Innovation Action
- Estimated Call Size: 10-20 Collaborative large projects (Between Research, SMEs & Large) up to €5M
- Estimated Call Budget: €50-100M

### Enabling Environment:

- Build on communities of Activities 2 and 3 to form new partnerships.



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## Activity 3 - Content Generation Tools for I<sup>2</sup>C

### Summary Reason:

- Currently content generation companies require off-the-shelf software that isn't optimised for an immersive pipeline OR they have to hire developers to create bespoke software.
- We want SMEs and Institutions to be able to create hardware and software that enhances the mainstream existing tools that will be available at the time of the call.
- Call based around Technology Clusters.

### Detail:

- A platform which includes cost-effective tools created by other parties to be more easily used (either via open hooks or APIs) would accelerate and make such content much more efficient.
- A set of middleware hardware/software that allows companies/consumers to deliver content to various mainstream immersive tech in the future.
- If such middleware leads to the creation of a standardized workflow and/or format which will encourage the uptake of the technology then this should be supported. Possible common standards.
- Shared infrastructure for cross sector content development
- Tools for content creation may be built on an open platform or instead manufacturers for end viewing devices (Hololens, MagicLeap, etc.) will provide an SDK to deliver content from existing engines like Unity / Unreal and the authoring tools will be built around these engines or existing content creation tools will interface and provide visualisation directly in the hardware.
- Tools should use Cloud Technology where appropriate to avoid local processing limitations.
- Automatic generation of content from data e.g. crowd sourced data

### Target Category:

- *Content Generation*

### Target Sector/Companies/Research Institutions:

- Advertising
- Architecture
- Construction
- Creative Industry (Film, TV, Games, Theatre, Arts, Music)
- Cultural Heritage
- Education
- Medical & Health
- News & Publishing
- Retail
- Telecommunications
- Transport (Rail, Road, Air)
- Research Institutions developing immersive solutions

### Impact:

- This activity will contribute to avoiding useless repetition of technological solutions already existing. This is expected to accelerate developments in content generation, distribution and visualisation and bring existent but unused solutions closer to the market. The use of common tools by different sectors is also expected to strengthen cross-sectorial links.
- This activity will allow technology creators to get support and early adoption allowing EU created technology to get worldwide traction.

### Instrument Type A:

- Research & Innovation Action
- Estimated Call Size: 3-5 Collaborative large projects (Between Research, SMEs & Large) up to €8M
- Estimated Call Budget: €24-40M

### Instrument Type B:

- Innovation Action
- Annex K competition type Innovation Action €150k for 15-20 Individual projects
- Estimated Call Budget: €1.5-3M

### Enabling Environment:

- Based on already existing European platforms (see FI)
- Use the communities of networked start-ups created in Activity 1
- Engage cross-sectorial communities (Pan-european network)



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## Activity 4 - Science, technology and arts in Immersive and Interactive Media

### Summary Reason:

- Augmented reality, virtual reality, 360 film, haptics, sonorisation and associated technologies will profoundly change the way that humans interact with data and information in all formats and through all senses.
- This action will provide a platform in which artists, technologists and engineers can work together to imagine and invent future modes of interaction with data, information and content in immersive environments. It will assist in the creation of a common language and understanding of the potential cultural, industrial and commercial applications of immersive and interactive media.

### Detail:

- Establish and facilitate structured dialogue throughout Europe across a network of arts and media centres, research institutions and businesses, to facilitate synchronisation of efforts;
- Support collaboration between artists and technologists to work together and unconventional and compelling new prototypes of products and services.
- Fund specific collaborations between artists, technology businesses and civic institutions to explore interaction and immersion in public spaces
- Organise high profile events with international outreach to showcase cutting edge examples immersive applications, involving industrial players, artists and engineers.
- Activity more focussed on creation of Narrative, Directing, Action, Writing and conceiving the story/setup required.

### Target Category

- *Content Generation*

### Target Sector/Companies/Research Institutions:

- Arts
- Creative Industries (Film, TV, Games, Theatre, Arts, Music)
- Cultural Heritage
- Hardware and Software Developers
- News & Publishing
- Research Institutions developing immersive solutions

### Impact:

- Build a network for the ‘fusion’ of the creative imagination of artists and the ingenuity of engineers and technologists in order to conceive and develop cultural, social and commercial applications of immersive and interactive media.

### Instrument Type A:

- Innovation Action
- Estimated Call Size: 5-10 Collaborative small projects (Between SMEs) up to €1M
- Estimated budget €5-10M

### Instrument Type B:

- Co-ordination and Support Action
- Estimated budget €5M

### Enabling Environment:

- This action would build on the outputs of the STARTS actions launched in the 2015 work programme.

## Activities 5 & 6: Coordination & Support Actions

### **Rationale:**

Europe’s leadership in immersive content is expected to be based on:

- Quality content generation in line with technological developments
- Development of innovative technological solutions putting content in best use
- Sustainable and marketable large and smaller businesses active in the field of immersive content

Based on the above, the suggested CSAs put emphasis on strengthening European research spin-offs, businesses and start-ups, creating cross-sectorial and cross-border synergies, and accelerating European ideas’ and technological solutions’ access to the global market.

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## **Positioning in the programme**

As Support Actions, they are intended to be applied “horizontally” throughout the programme, that is to say cut through the different activities:

- Training activities will help companies have access to the fund developed through activity 1
- Supported startups, professionals and research institutions will be contributing to the platforms of Activities 2 and 3
- Provision of customized support for all tech and content-driven companies, professionals or researchers involved in Activities 4, 7, 8, 10, 11, 13. The needs of companies, researchers and professionals will be assessed and they will benefit from the packaged tools of the support actions.
- Training to handle the predicted shortfall of a skilled workers who understand and will be expert in Immersive Content Generation and Technology.

## **Actions Description**

### **Activity 5 – Direct Support to Startups and Microenterprises**

Direct Support to startups in *Creative content production, Technology, Business, Financing*

Detail:

Personalised mentorship will be offered to selected startups or research spin-offs by field experts. The startups and spin-offs will be selected via the participating organizations/ regional centres (see support action below) according to set criteria. The 4 fields of expertise (Content, Technology, Business and Finance) are aiming to cover all strategic needs of companies specializing in immersive content. This will be addressed to both tech-driven content startups and tech startups that need access to content.

Actions could enable:

- *An online training platform offering startups access to a pool of experts. Tailored connections between experts and startups will be established so that their exact needs are met. The network of experts will consist of:*
  - *Content*
    - *artists making use of AR/VR,*
    - *experts in gamification, storytelling and design*
  - *Technology*
    - *AR/ VR technology university experts*
    - *Heads of R&D departments in enterprises or research institutions*
  - *Business*
    - *Mentors specializing in tech and content innovation*
    - *Successful entrepreneurs*
  - *Finance*
    - *Coaches on access to investment*
    - *Banks offering advise on lending*
    - *Crowd-funding experts*
- *Training Workshops and networking events focusing on each of the 4 training categories:*
  - *Content training brought to tech-driven companies*
  - *Tech understanding for content professionals*
  - *Business and finance training for all*
  - *Networking opportunities to connect the two communities*
- *Pitching competitions of selected teams in front of investors to get access to the fund developed in Activity 1*

Target Category:

- *Content Generation*
- *Content Distribution & Processing*
- *Content visualization and interaction*

Target Sector/Companies/Research Institutions:

- *Creative Industry (Film, TV, Games, Theatre, Arts, Music) that make use of VR/ AR*
- *Tech companies needing access to content*

Impact:

- *An easily-accessible network of experts will be a huge benefit for tech and content companies active in the field*

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- A platform that can become a unique access point for the best European AR/ VR businesses that need advice
- Already existing startups specializing in immersive content will get become more market-ready
- Opportunities for startups to meet, network and develop synergies will be created

### Instrument Type:

- Coordination & Support Action
- The cost consists of training fees, event organization and platform setup
- Estimated duration: 3-5 years
- Estimated Call Budget: €5M

### Activity 6 – Support to Intermediary Organizations

- Creative content production
- Technology
- Business
- Financing

#### *Detail:*

Transfer of knowledge between organizations and institutions: digital art organisations, clusters, research institutions, business centres, funding institutions.

This will address: Immersive technology skills shortage, lack of knowledge in immersive content production, lack of business skills and difficulty to access the global market. Exchange between institutions of different or the same focus will strengthen Europe in tackling these issues.

#### *Actions could enable:*

- Knowledge transfer actions -in the form of workshops, webinars and forums- between organizations of the same kind (research institutions and clusters) from countries with more experience (Sweden, France, Germany) to other EU countries with little knowledge in immersive content production & technology development.
- Exchanges between organizations of different type: for ex. exchanges of expertise between clusters (content) and research institutions (technology), *or* exchange between media clusters and business centres.
- Collaborations between universities, clusters, business centres and incubators.
- Exchange of training activities allowing training in skilled production of content appropriate for immersive experiences & training in immersive technology development.
- Business training activities and access-to-finance advice offered from organisations with a business focus to organisations that are lacking such an element
- Recruitment of business incubatees among researchers (transformation of projects into companies)
- Mobility of start-ups and researchers and cross-border collaboration
- Regional Centres of expertise that can be used for training of skills and future workforce required
- Visual workspaces setup that can be used with supplied AR/VR tech and experts.
- Links to International industry & academia UX.

#### Target Category:

- *Content Generation*
- *Content Distribution & processing*
- *Content visualization and interaction*

#### Target Sector/Companies/Research Institutions:

- Research Institutions developing VR/AR solutions
- Creative industry cluster and incubators (specializing in immersive content)
- Digital art and organisations
- Professional associations
- Clusters and incubators
- Funding institutions

#### Impact:

- High knowledge transfer impact
- Will strengthen smaller players and regions
- Cross-border collaborations and synergies

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Instrument Type:

- Coordination & Support Action
- Will allow the creation of a network of organisations and setting up of regional centres (including visual workspaces). This could be of the form of a competition to set up several such networked centres at key locations across the EU.
- The cost would be split between location and equipment, recruitment of experts for training and mobility of startups, researchers and trainers
- Estimated Call Budget: €5-10M
- Duration: 3-5 years

Table of Sectors affected

Sector	Activities	Sector	Activities
Advertising	2, 3	Medical & Health	1, 2, 3
Architecture	1, 2	News & Publishing	1, 2, 3, 4
Construction	1, 2, 3	Retail	1, 2, 3, 4
Creative (Film/TV) Creative (Games) Creative (Theatre/Arts) Creative (Music)	1, 2, 3, 4, 5,	Telecommunication	1, 2, 3
Cultural Heritage	1, 2, 3	Theme Park Entertainment	1, 2, 3
Digital Distribution Companies	2, 3	Transport (Road, Rail, Air)	1, 2, 3
Education	1, 2, 3,	Utility	1, 3
Financial	1, 3		

(Please note that the Creative Industry may often drive/create content to be used by other sectors.)

### Summary of Activity Budgets

It was noted at the NEM Steering Board that the proposal funding method may no longer be a PPP but that the activities described may become part of different calls in the current round of funding. Therefore, the activity list below which was designed for a PPP is still valid, with each activity call types and budget described, but the overall budget in reference to a PPP may no longer be relevant.

Once more information on the possible funding for the activities is known the types of call can be more closely investigated to see if appropriate.

Activity	Call Types & Estimated Budget	Activity	Call Types & Estimated Budget
1	Innovation Action €25-30M	4A	Innovation Action €5-10M
2	Research & Innovation Action €50-100M	4B	Coordination & Support Action €5
3A	Research & Innovation Action €24-40M	5	Coordination & Support Action €5M
3B	Innovation Action €1.5-3M	6	Coordination & Support Action €5-10M

**Current Total I<sup>2</sup>C Budget Estimate: €120M - €203M (Min to Max range sum of activities above)**