

Human Capital line of action: talent & skills for IX



Inhoudsopgave

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Introduction

The internet changed the world. Following which, mobile technology brought in a new phase of changes. And now a third wave of change is on the way: *immersive experiences* (IX). With IX, the real and digital worlds merge. To be a part of this, we need professionals and organisations who can see and make use of the opportunities IX offers. And CIIC — the Creative Industries Immersive Impact Coalition — focuses on those opportunities. Below you can read about the talent and skills needed to make IX a success, and how CIIC approaches these developments and supports you through this process. Another name for *talent & skills* is *human capital*. CIIC's approach is all about the value of the knowledge, experience, skills and creativity that people have to offer.

This document is a work in progress. It describes what we want to achieve with so-called *learning communities*. As and when we have sufficiently developed any other topics, we will add them to this document.

But we begin with: what CIIC is, what our goal is and how we want to achieve that goal.

1. About CIIC – the Creative Industries Immersive Impact Coalition

1.1 A leading position for the Netherlands in IX

Following the internet and mobile, we are at the dawn of the third digital wave and a new revolution: a world where digital and physical merge seamlessly. These so-called *immersive experiences* offer unprecedented possibilities. From groundbreaking innovations in healthcare to new forms of learning and working. It is a global wave that we must shape together.

CIIC (pronounced: *si, triple-eye, si*) – is a programme of the National Growth Fund (NGF) intended to give the Netherlands a leading position in IX. CIIC was developed by the

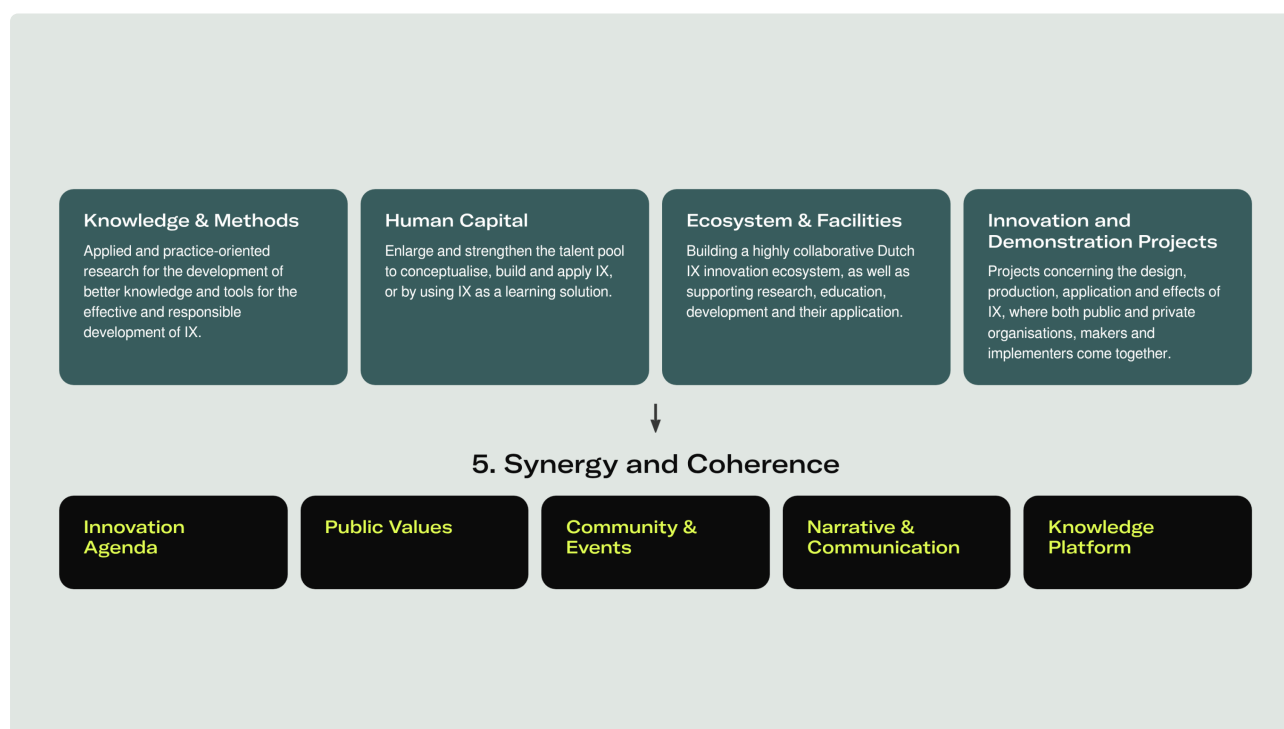
Ministry of Education, Culture & Science, the Ministry of Economic Affairs, companies and knowledge institutions. We offer support to makers of IX, companies, civil society organisations, educational institutions and researchers to help them make the most of the opportunities they have in IX. In other words, CIIC supports you from R&D right through to market introduction and growth.

With an investment of €200 million and the expertise of leading organisations from research, business and government, we are helping build the future of IX. A future in which we combine renewal (innovation) with important social values such as privacy and accessibility, in such a way that everyone can participate.

On our website you can read [About CIIC](#) and what we can do for you: [Why CIIC?](#)

1.2 The CIIC programme

CIIC's programme consists of four functional components: research, training, facilities and entrepreneurship (through the innovation and demonstration projects). These collaborate in a fifth component: synergy and coherence. For each functional component, we have developed schemes to encourage the use and development of IX. The collaboration focuses on five themes and structured as follows:



With each of these activities, CIIIC works on upscaling and accelerating. That means we help you develop IX solutions faster and deploy them on a larger scale. This is exactly why it is important activities in the field of talent and skills are successfully combined with networks, projects and ideas to create synergy and cohesion. We discuss this in more detail in the next section. On our website, you can see the [agenda for innovation](#) and [social \(public\) values](#) theme that are the starting points for all our activities.

2. Talent & skills

2.1 Why does CIIIC focus on talent & skills?

We won't achieve the upscaling and acceleration of IX we want through new technology, innovation and the market alone. Because without people, there is no new technology, innovation or usage. To develop, use and accept IX, we must know and understand what exactly IX is. How does it work? What can you use it for? We need to identify the opportunities and possibilities it offers. And we must remain critical, because IX must conform with social values.

Talent in every field imaginable

This means talent is needed for scaling up and accelerating, including new talent. And that talent is required in all kinds of areas, as well as the areas linking them up. For example, developers and makers who know a lot about IX, artificial intelligence (AI) and design. Or talent in domains like healthcare and safety who can spot the opportunities IX offers in their fields. This talent must also ensure the professionals in those fields accept IX and can work with it. But other talent is also needed, from practical to academic, from technical to social, from design to communication.

Where it's needed, when it's needed

With this focus on talent & skills, we want to ensure there are sufficient, well-trained professionals for IX in time. And that these professionals are in the key functions and fields throughout the chain, and in the domains where talent and skills are most needed.

2.2 How do we get the talent and skills for IX?

There are all sorts of ways to ensure we have the talent and skills needed for IX, especially through education and training. Here is an overview of what we need for this:

- Encourage young talent to follow appropriate (relevant) training courses. In addition, promote career opportunities that will interest young people who successfully complete these courses.
- Train professionals who are already working with IX and want or need to develop further.
- Train professionals who work in areas where IX is used. These are areas where professionals will increasingly work with IX and require basic-level insight and knowledge.
- Train professionals who work in the links in the IX chain (for more details, see section 2.3).
- Train talent from other sectors who want to work in the IX domain (so-called *lateral entrants*).
- Let Dutch talent gain knowledge and experience in international organisations. Use the strong international knowledge of the Dutch IX sector to facilitate international collaboration. And make the Netherlands attractive for international IX talent.
- Train teachers and trainers for domains suited to IX, both in public and other institutions as well as companies.
- Strengthen the collaboration between innovation institutions, education and business to ensure any new knowledge from innovations quickly flows into the practice of companies and the education system.

2.3 The IX value chain

IX is a new domain on which there has been little labour market research done. Moreover, not all sub-areas of the IX domain have yet been clearly defined. But if we hope to come up with good ways to develop talent and skills, we need insights. This means:

- having a good idea of the areas of knowledge that are important;

- knowing what kinds of organisations and professions we're talking about;
- knowing what knowledge and skills are needed, now and in the future.

So we carried out interviews and desk research to define a so-called *value chain*. A value chain consists of the elements that are important if we are to take advantage of the opportunities IX offers. To define this value chain we have relied heavily on the classifications used in the creative industry (this list is not exhaustive):

- The domain of the IX makers with subdomains such as creative design, user experience, graphics, game development, social interaction and creative storytelling.
- The subsectors within the creative industry:
 - media & entertainment, with subdomains such as media, festivals and cinemas;
 - art & culture, with sub-domains such as theatres, museums and cultural heritage;
 - creative business services, with sub-domains such as public order & safety, education & training, care & welfare, the built environment and industry.
- Distributors, including the various platforms.
- Creative and business 'connectors' between IX makers and the domains where IX is applied.

2.4 The building blocks of CIIC's talent and skills approach

In order to interest enough well-trained professionals in the IX domain, we work with six building blocks. The first three are part of our talent & skills programme, the last three there to support professionalisation:

- Powerful learning communities (initially 6-12). These communities will lay a sustainable basis (ecosystem) for training and innovation in IX. They will do this through a collaboration between knowledge institutions, companies and societal organisations (See section 4 for more details).
- Market-oriented training modules to develop skills and competencies (about 15 modules initially increasing to 30). The modules help IX makers and professionals working in areas where IX is used to develop specific skills and expertise.

- Training professionals in the IX domain throughout the entire value chain (3,000 initially eventually growing to 10,000 trained professionals).
- Activities to attract talent: young talent, professionals from other sectors and fields of knowledge, and international professionals.
- Professionalisation of the IX labour market. We will provide knowledge about the labour market. We base this on, for example, the (Dutch) Games Monitor 2024, which monitors the creative industry, and the recently released *Creative Industries Employers' Perspectives on Skills Initiatives 2025*. We also stimulate agreements regarding the modular organisation of education (i.e. education that consists of smaller, independent components).
- Connecting skills & talent and the other CIIIC pillars such as facilities & ecosystems, knowledge & methods, innovation & demos, and public values.

2.5 Synergy between talent & skills and the CIIIC programme

The theme of talent & skills is not something separate from the CIIIC programme but interwoven with it. This creates synergy: the different parts reinforce one another, as we explain here:

Synergy between the activities for talent & skills

First, we work with IX-learning communities (officially: *CIIIC Learning Communities for IX talent and skills*). For this, along with the Netherlands Organisation for Scientific Research (NWO), we invite everyone to shape these communities in a Call for Proposals. We are also working on other building blocks of our approach to talent & skills. These include, for example, the Development Programme for Market-oriented Education & Training Modules and the Incentive Impulse for Education & Training of IX professionals.

We ask all participating parties to make it as clear as possible how they will develop a relationship with the other building blocks in our approach. For example, in the case of learning communities this is the need to connect with the Development Programme for Market-oriented Education & Training Modules, and with the 'training impulse' (vouchers) that we will introduce later.

Synergy with other CIIC activities

The strength of CIIC lies in the synergy between all activities (see building block 6 in section 2.4). This requires strong central direction, vision and coordination throughout the CIIC programme. We do this by:

- developing ecosystems in multiple locations;
- developing methodologies;
- focusing on innovation;
- safeguarding ethics and public values.

There also needs to be synergy between talent & skills and the CIIC's other functional components (as covered in section 1.2) — the facilities that become available through IX labs and so-called *innovation and demonstration projects* (and the training of professionals within these projects). This is why it is good also to arouse interest in the learning communities among participants in these labs and projects.

Synergy with other NGF programmes

Other programmes in the NGF have learning communities in related areas, for example: DUTCH (training for hospitals) and AIC4NL (focused on AI), which target similar audiences with similar content and approaches. We ask participants in our talent & skills activities to also look for cohesion with these programmes when the opportunity arises.

Other NGF programmes, such as Npuls and LLO-Catalyst, focus more on professionalising lifelong development (LLD), for example by developing career paths. The material developed by these NGF programmes has a lot of added value for CIIC and applicants to learning communities should include these programmes in their plans.

3. Important principles for talent & skills

3.1 Space for the creative professionals

In our approach to talent & skills, we take into account the current circumstances of creative professionals and companies. According to the *Games Monitor 2022* and *2024*, and *Creative Industry Monitor 2023*, the creative sector consists of a great many small companies, certainly in the IX domain. And in small companies there is often little room for large investments or personal contributions. So we take account of this in the preconditions we set.

3.2 Dynamic ‘go for it’ approach

We have a quantitative and a qualitative goal. We want more people in the IX labour market (quantitative), and to educate and train the professionals already working in that market in new knowledge and skills (qualitative).

Developments in IX are moving fast, so knowledge quickly becomes outdated. This makes it difficult to give exact numbers of professionals working in it or clearly describe the areas of interest. There is virtually no good quality information on the labour market, which is why we have opted for an approach where we just start up, show that something works, initiate a movement, make adaptations along the way, set new things in motion if necessary and cease doing those things that don't work in practice. This approach is a good fit for the dynamic world of IX and the profiles of the professionals who work in it, and the only way to succeed.

At the same time, we encourage the further professionalisation of talent & skills (see paragraph 2.4).

3.3 Providing a foundation and adapting to developments

We therefore want the programme to adapt to developments within the market, but at the same time lay a solid, sustainable foundation for IX. This means we respond to trends and new developments but don't always react immediately when, for example, insights change.

We are convinced that there is basic knowledge and skills that are important for IX. We also think it important to invest in a structure that can easily respond to new developments. This applies to both our quantitative and qualitative goals. Economic developments are, especially in times like these, erratic and unpredictable. As a result, the growth of IX may be a bit slower than we currently expect. But there's no doubt IX has a promising future. The pace of scaling may vary but the end outlook remains unchanged.

Finally, the skills for IX are also important in other domains, such as digitization and AI. As in other innovation programmes, it will become clear in the field whether the talent & skills component is suitable for more domains. This makes our approach less sensitive to economic fluctuations.

3.4 Building on what already works

We aren't beginning from scratch, as powerful ecosystems already exist for IX. These include:

- OASIS, the Centre for Expertise Creative Innovation in Amsterdam, BUAS in Breda, HKU in Utrecht, Artez in Arnhem and the SHINE-network in Rotterdam.
- Private ecosystems, for example at the EYE Film museum, the Institute for Sound & Vision and the Nieuwe Instituut (New Institute).
- Market-oriented initiatives that it may be possible to develop into innovative models for education and training.

SIA (the Taskforce for Applied Scientific Research) is investigating which IX partnerships are already in place (potential learning communities). SIA is an institution that works to further the quality and impact of practice-oriented research at Dutch

Universities of Applied Sciences. This study will be completed during 2026 and often concern young partnerships with a range of different objectives.

3.5 IX: an international market

The market for IX is very international. New technologies and applications are being developed worldwide and asking for quick adoption. The Netherlands has a leading position internationally. This is thanks to our high-quality expertise and levels of activity, and because we are very internationally oriented. CIIC wants to build on this by:

- giving Dutch talent positive international attention;
- making international partnerships attractive;
- utilising national IX expertise internationally;
- attracting international talent who would like to work in the Netherlands.

In this way, CIIC wants to create excellent conditions for training in IX. And ensure the existence of high-quality IX communities and IX companies that become well known internationally.

4. The importance of IX-learning communities in the field

As you saw in the paragraphs above, the IX domain is constantly evolving.

Developments in the market and technology are moving at lightning speed. This is why CIIC wants to bring together innovation, work and learning. The development of knowledge and its use are closely linked, both for young talent and professionals already working with IX.

IX-learning communities are focused primarily on training and on partnerships that enrich and increase knowledge and talent. This is mainly about the development of IX professionals. By simultaneously developing, implementing and researching training courses in practice, IX-learning communities also provide insights that can improve and

expand those training courses. In the Call for Proposals for IX-learning communities (see section 2.5 above), we explain the activities we hope to stimulate in this way. We kept this explanation general because we go into more detail below on the activities that we want to stimulate with our Call.



4.1 What do IX-learning communities do?

IX learning communities stimulate close collaboration between institutions for innovation and knowledge, educational institutions, companies and societal organisations. This ensures new knowledge from innovations can rapidly find its way into the practice of companies, and public and other educational institutions. This is done by training young talent and by the LLD of professionals (deepening skills or retraining).

We want to ensure a lasting public-private collaboration. This will create a sustainable structure for innovation and training for the IX domain (a ‘responsive ecosystem’).

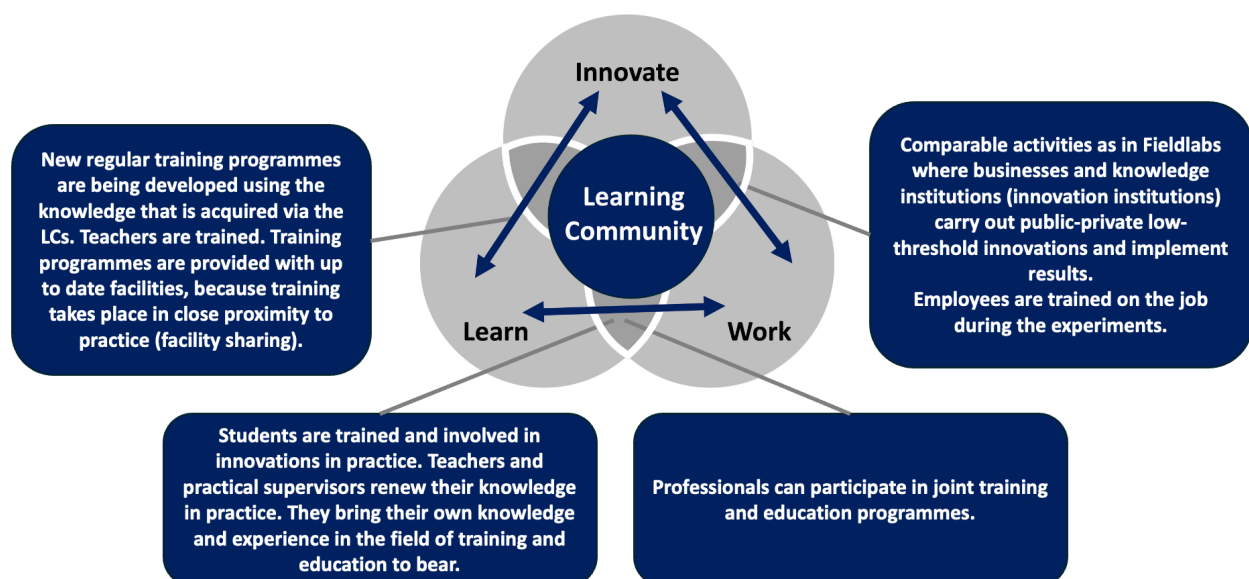
Knowledge institutions, educational institutions, and business and societal organisations work together on innovation and the training of professionals and young talent. In these close-knit ecosystems, knowledge is systematically developed and exchanged regarding effective education and training. Practice is central to this. This is done by tackling so-called *use cases* in education or training: practical questions that the participants work on. The participants in the learning communities investigate how

useful and effective the developed education and training courses are, and whether they can expand them in a particular IX context (dynamic, flexible, practical, co-creation, multidisciplinary, etc).

The target audiences for these *use cases* vary:

- different types of professionals, depending on the position of the learning community within the IX value chain: focused more on IX makers or users, or on other links within the IX value chain;
- lateral entrants from other sectors;
- teachers or target groups that you reach through Teach the Teachers – training where professionals learn how to transfer their professional knowledge to colleagues;
- international professionals who come to the Netherlands.

In these *use cases* we also work on real and digital facilities in order to develop education courses and training for IX. Where necessary, they can link up with the IX labs that we are also developing via the CIIIC programme. We are also working on joining forces and sharing knowledge, within the ecosystem but also between the various learning communities that the ecosystem has created (see the diagram below):



4.2 Thematic organisation of learning communities and subsectors

In this final section we list the learning communities, subsectors and combinations of the two.

Organising into themes

In IX-learning communities, the main issue is how we can provide solutions for learning, working and innovating on themes from IX in the field. All parties will work together in this process, focusing on new models for learning and development. They will develop, implement and research these models to make upscaling possible at a later date. To help stimulate and strengthen the IX-learning communities, we have chosen to organise them into six themes:

- Increasing knowledge and understanding of IX among professionals and potential new users of IX solutions in every area where IX can be utilized. What promising learning models can we develop where we offer IX as an alternative to more traditional forms of education and communication, thereby increasing the understanding and application of IX among professionals?
- Joint development throughout the IX value chain. So from concept and content development to product and application. What promising learning models can we develop to collaborate successfully and in a function-oriented way through the whole IX value chain - from design, onboarding and user experience to market readiness?
- Translating (socially important) practical issues into appealing IX concepts that ensure we really experience just how important those practical issues are. For example, what promising learning models can we develop to translate social issues, such as climate and healthcare, into IX concepts (e.g. by converting (scientific) knowledge into socially responsible IX concepts)?
- Distribution and infrastructure. What promising learning models can we develop, implement and research that will promote the idea that IX concepts are better and can be scaled quicker?
- Reuse, further development and upscaling. What learning models can we develop to support the step-by-step development and multi-application of IX concepts, from (serious) gaming to social applications?

- Public (social) values. What learning models can we develop to help makers, researchers and users develop an IX that is safe, responsible and accessible to everyone?

Organising into subsectors

In its classification of subsectors, CIIIC has followed the main classifications used in the creative industry:

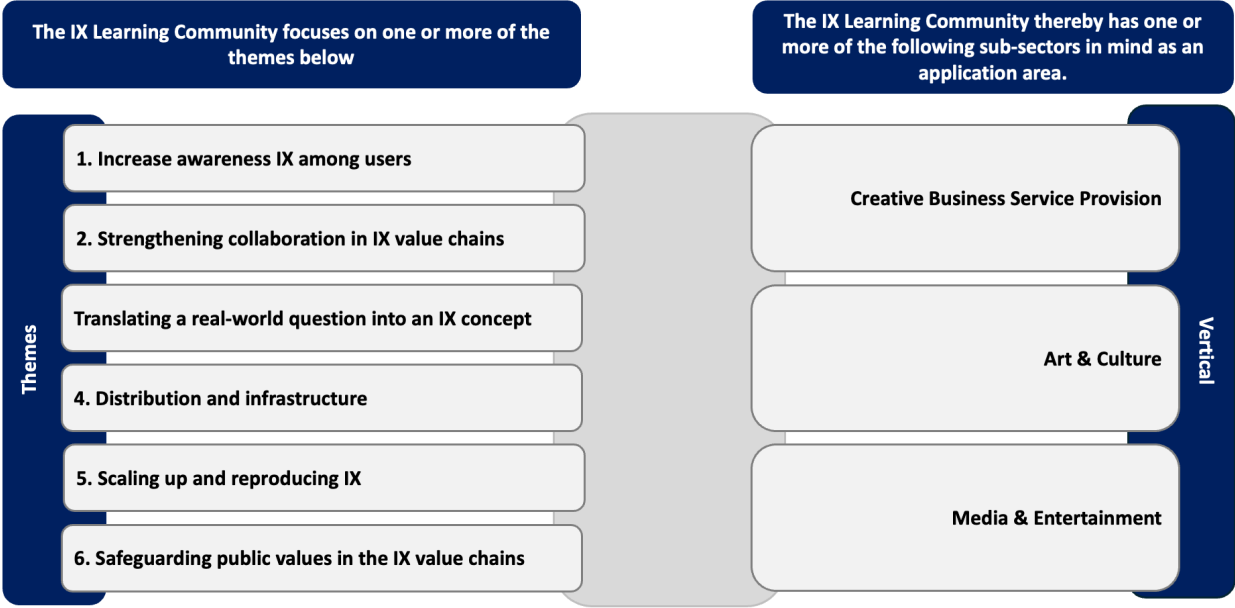
- creative business services
- art and culture
- media and entertainment

Within these subsectors, we can further identify sub-areas. We have done this in section 2.3, with an overview that is not comprehensive but intended to give an impression.

Combinations of themes and subsectors

As stated in the Call for Proposals (see also section 2.5), an applicant must identify at least one main theme. You can also indicate whether, and if so which, other themes are addressed. These are then seen as subthemes in the application. Given the considerable cohesion that exists, this is likely to be the case quite often.

CIIIC also wants applicants to specify which subsector the learning community is aimed at. Here, too, you can say if the application concerns multiple subsectors.



Appendix 1. Indicative Overview of Skills and Competencies per Theme (Section 5.2)

Theme 1 – Increasing clients' knowledge and understanding of IX	
Current Gap	- There is insufficient understanding among public and private clients of what IX (immersive experiences) concretely entails, what it can offer, and when it is meaningful to deploy it. IX is often confused with individual technologies (VR, 360°, games), without a strategic framework.
Missing knowledge	- Differences between forms of IX (VR, AR, MR, gaming, 360°) and their application contexts - When IX is and is not a suitable solution - The impact of IX on users (experience, behaviour, engagement) - Basic knowledge of technology, costs, and implementation - Examples of proven applications and use cases
Required skills	- Problem formulation: translating a societal or organisational challenge into an IX solution - Assessment and judgement: evaluating IX applications in terms of value, effectiveness, and risk - Internal alignment: engaging stakeholders and creating a shared understanding - Client commissioning: formulating the right brief and setting realistic expectations - Networking skills: identifying and activating the right internal and external partners

Theme 2 – Application-oriented development (from R&D to market-ready IX)	
Current Gap	- Many IX projects remain at the experimental or prototype stage. There is insufficient knowledge of how to move from a concept to a scalable, applicable, and sustainable solution.
Missing knowledge	- End-to-end IX production chain (from concept → UX → testing → implementation → scaling) - Onboarding and user guidance within immersive experiences - Business models and value propositions for IX - Implementation context (where, how, and by whom is the application used?)
Required skills	- User-centred design (specifically for immersive environments) - Onboarding design (how do you guide users within IX?) - Proposition development (defining value for specific target groups and stakeholders) - Business thinking (costs, benefits, scalability) - Iterative development and testing (with real end users) - Translation into practice: moving from creative concepts to applicable products

Theme 3 – Connecting creators and researchers (Data → IX)	
Current Gap	- There is a wealth of valuable (scientific) data, but insufficient capacity to translate this into understandable, experiential IX applications.
Missing knowledge	- How data and research can be translated into immersive forms of representation - Methods for transforming abstract data into narratives and experiences - Understanding each other's working practices (creator ↔ researcher)
Required skills	- Data interpretation for creatives (what does the data actually mean?) - Data storytelling (turning data into experience and emotion) - Visualisation in 3D/immersive contexts - Interdisciplinary collaboration (developing a shared language) - Co-creation skills between the scientific and creative sectors - Translating complexity into accessibility

Theme 4 - IX distribution and infrastructure	
Current Gap	- There is fragmentation in how IX is distributed and experienced. Creators and clients lack knowledge of distribution models and technical infrastructures.
Missing knowledge	- Distribution options for different forms of IX (location-based vs. online vs. hybrid; single-player or multiplayer) - Technical requirements (hardware, networks, platforms) - Scalability and reach of different formats - New distribution models (e.g. shared XR spaces, dome installations, mobile XR)
Required skills	- Developing a distribution strategy (which channel best suits the target audience and application?) - Technical understanding of infrastructure (devices, platforms, compatibility) - Expanding audience reach (accessibility, scalability) - Collaborating with presentation venues (museums, festivals, education, online platforms) - Operational implementation (installation, maintenance, support)

Theme 5 – Reuse and further development	
Current Gap	- IX productions are often developed as one-off projects, without a strategy for reuse or further development.
Missing knowledge	- How to design IX in a modular way - How to make content transferable and adaptable - Opportunities to use applications across multiple contexts
Required skills	- Modular design (building blocks rather than a single end product) - Cross-sector thinking (from gaming → education → healthcare → cultural heritage) - Scaling mindset (further development and version control) - Technical flexibility (reusable code, assets, and engines) - Long-term vision for impact and use

Theme 6 – Public values (cross-cutting and integrated)	
Current Gap	- Public values are not yet sufficiently and systematically incorporated into IX development. There is limited awareness as well as a lack of concrete approaches for putting these values into practice.
Missing knowledge	- What public values mean in an IX context (privacy, autonomy, inclusion, safety) - Risks of immersion (manipulation, addiction, physical/mental strain) - Laws and regulations relating to data and technology - The impact of IX on behaviour and perception
Required skills	- Ethical and value-sensitive design (translating values into design choices) - Privacy and data literacy (including biometric and behavioural data) - Inclusive design (different bodies, cultures, and abilities) - Risk analysis and scenario thinking (what could go wrong?) - Transparent communication with users about data and the experience - Setting boundaries: distinguishing between engagement and manipulation - Interdisciplinary collaboration with legal professionals, ethicists, and policymakers