SIIL – a Screen Industries Innovation Lab for Ireland

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Immersive Technologies Skillnet

Animation Skillnet

Screen Skillnet

TECHIRELAND

Feasibility Study for SIIL a National Innovation Lab for the Irish Screen Industries

(Film, Animation, Games, Augmented and Virtual Reality technologies)

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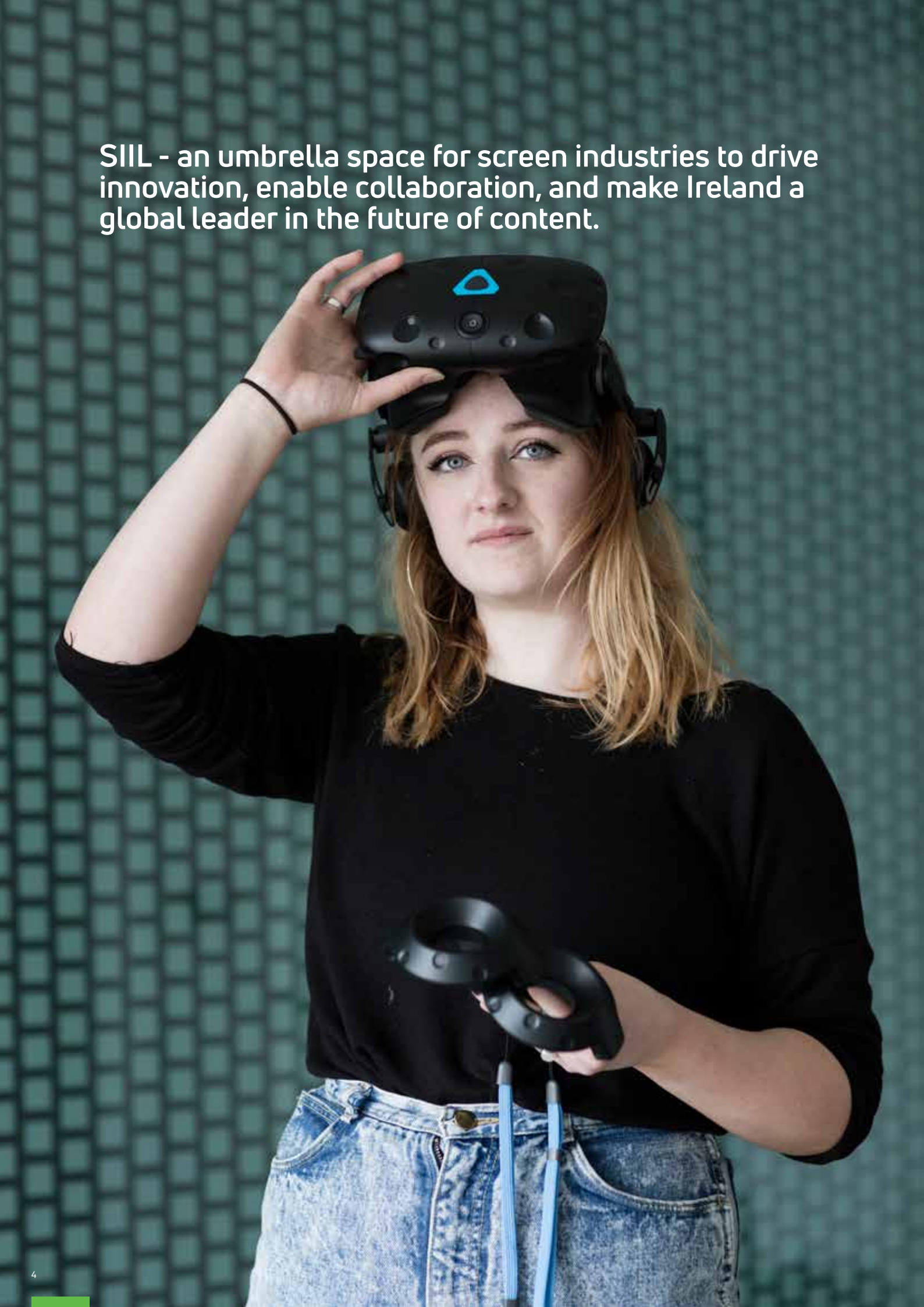
SIIL - an umbrella space for screen industries to drive innovation, enable collaboration, and make Ireland a global leader in the future of content.



Foreword

Screens are now ubiquitous across industry and society. Screens are how we get our information and entertainment. From TV to film to games and across the nascent sectors of augmented reality and virtual reality, the technologies are converging and developing rapidly.

These are industries that are growing, with technologies that are continuously evolving. Digital transformation is redefining job functions across all organisations and industry sectors. As a result, there is a global demand for the skills, and a shortage of the talent, that will be needed to accelerate innovation and boost the competitiveness of these sectors.

The concept of an Irish Screen Industries Innovation Lab (SIIL) to support the training and research needs of the animation, screen, gaming and immersive technology sectors has been discussed for several years. This study confirms the validity of the concept and acknowledges the potential that such a facility can make to drive innovation, enable collaboration, and make Ireland a global leader in the future of content.

The report highlights the huge potential these sectors have for Ireland in terms of employment and wealth creation. While they are expected to grow rapidly over the coming decade, the bottleneck is going to be in delivering the skills and talent needed. There is a serious shortage, particularly of technical skills such as animation, digital screen and immersive technology. This calls for increased training for digital screens with the requirement for modern digital screen facilities here. SIIL could go some way to addressing this challenge and help to network the existing training facilities and organisations.

We hope that this report will focus the various industry players and state agencies on the need for a national SIIL.

On behalf of Skillnet Ireland, I would like to thank the contributors who have generously given their time and expertise to this report and the members of the Steering Group for their insights and support. Finally, I wish to acknowledge our partner for this report, TechIreland, for their excellent work in identifying the issues and the path forward.

Executive Director
Skillnet Ireland

Executive **Summary**

This study explores the case for developing a Screen Industries Innovation Lab (SIIL) for Ireland. By aligning as one creatively focused but technologically driven entity, a physical incubator for the screen and immersive tech industries has the potential to become the digital home for all things animation, immersive, and screen. A world-class screen industry will require both talent and innovation, this will require an increased focus on research and training.

The study is based on an industry survey of more than 70 Irish businesses which aimed to understand their views on the need for such an innovation lab and what the priorities should be. It also involved interviews with over 40 industry experts, both here and abroad about the SIIL concept and how it might become a reality. The response was uniformly positive. **There is overwhelming industry support for SIIL.** Most companies and experts deem this an urgent requirement if Ireland's screen industries are to achieve their potential.

In the absence of a significant corporate donor/investor, a three-phase approach makes sense.

Phase 1 "Push out the Boat" get industry talking

Start incrementally with a modest budget. A conference with an industry roundtable to clearly articulate the needs and gaps.

Phase 2 Online Hub and Identify Funding for the Physical Hub

Build a social network and communication channel with industry information and the potential for online meetups and events. When a suitable funding opportunity is on the horizon, identify partners and develop a strong business plan.

Phase 3 Physical SIIL

With facilities for training and research, meetups, demos, and co-working.

SIIL will focus on Training, Research, Information Sharing, and Collaboration, with physical and online elements.

SIIL can address many of the recommendations of the Skills Needs Report published by Screen Skills Ireland (2019). It will support Ireland's capacity to compete internationally to create jobs and exports. We have the ingredients – a competitive tax regime and a great track record of co-production. To take advantage of the global increase in the demand for content we will need to devleop and retain talent. SIIL will help build a sustainable talent pipeline with the potential to engage greater cross-sector supports for upskilling all screen technology and make a powerful statement about Ireland's intention to grow a world-class industry here.

There is an existing nucleus of relevant organisations that have expressed an interest in bringing SIIL to reality. The next step is to build connections with commercial and research bodies across Ireland.

SIIL should consist of both online and physical space(s), ideally alongside digital production training facilities and research with accommodation for meetups, demos, training, and co-working.

The online element will focus on the meeting of minds, fostering a network for cooperation and collaboration. It will help to build a community, which is needed for these sectors that are converging but that as yet are quite separate.

With regard to training, SIIL should be a hub that focuses on training and research. While the screen industries are expected to grow rapidly, the bottleneck is going to be in delivering the relevant and up to date skills needed by the industry. There is a serious shortage of talent, particularly in technical skills such as animation, digital screen, immersive technologies and sound. There was a lot of focus on the need for ~~a~~ volume stage[2] as the obvious gap in training facilities now.

Research should be the other prime focus of SIIL. While there is significant funding available for research in Irish institutions and by companies, the sectors represented by SIIL seem to be relatively under-represented. This is something that will have to improve if Ireland is to achieve our ambition of having world-class innovative companies in the sectors. SIIL could serve as a focus and catalyst for added research activities in these technologies

While the key priority is to create a centre with a strong training and research agenda, SIIL must also have a commercial focus to be sustainable.

SIIL could be co-located with a third-level institution or beside industry (such as a film studio), or as part of an existing start-up/tech hub. Each option has attractions and potential limitations.

Similarly, as to geographic location, there are several possible alternatives, each with its advantages and potential champion sponsor organisation. There is also the potential for a "hub and spoke" model with dispersed facilities linked to a national centre.

As regards support and facilities, Ireland already has significant capacity in various third-level institutions, and private facilities, with several more in the planning stage. There is merit in building a database of these facilities and supports.

Concerning funding, all similar developments elsewhere involve state funding as an anchor with industry contributions. The Irish experience is likely to be similar. This report outlines some potential sources of funds, which could incentivise the industry to become involved.

At least in the medium term, SIIL will need to be financially viable, with a self-sustaining business model and with real industry involvement.

To progress to the next stage, it will be essential to continue to build the community and the coalition of supporters for SIIL. A high-level conference later in 2022 would be an ideal first step.

[2] Film set surrounded by large, high-definition LED video wall displaying computer-generated backdrops. Traditionally composited in post-production after shooting with green screens. When shooting, the production team is able to realign the background instantly based on moving camera positions. The computed generated background can be manipulated in real-time.

A phased approach

The three creative Skillnet networks (Animation, Screen and Immersive Technologies) are best placed to take the lead on progressing these recommendations. While it is not yet clear which body will ultimately deliver SIIL, the three creative Skillnet networks are keen to advance the project and are well placed to deliver on the industry-focused training aspects of SIIL down the line.

Phase 1

Conference, Round Table

The first step should be a high-level conference with an industry roundtable to clearly articulate the skills needs and gaps. This will help to build the network and the coalition. Furthr Festival 22 could be an ideal opportunity to provide a platform and visibility for SIIL at the right level. Skillnet Ireland is probably the best organisation to move this forward.

Phase 2

Online Community, Mapping, Research, and Training

Building a social network takes time and resources. The online hub can be built incrementally over time to include the following elements:

- Web portal and social media for the screen industries [can help build a community]
- Industry information database and calendar
- Inventory and links to the training and educational resources we have now
- Inventory and links to the research activities in these sectors
- Deliver online education and training resources for the sectors
- Network the current research and training across the island of Ireland
- Events and meetups organised by the Hub
- When a suitable funding opportunity is on the horizon, identify partners and develop a strong business plan. The business model will have to be built around R&D and training with strong support from industry. Plan and design the facility.

Skillnet Ireland could initiate this online community and offer support but may not be the appropriate organisation to lead it in the longer term.

Phase 3

Physical SIIL

- With facilities for meetups, demos, training, and co-working and a virtual production studio
- With a determined and energetic management team and a real commitment to innovation
- Linked with research facilities and third-level research and education capabilities
- With buy-in and leadership by large organisations with resources to put into training, research and development.

1.

SIIL - What is it? Why now?

Screen Industries: Film, animation, games, immersive technologies, and other sectors that employ screen technologies are sectors that hold huge potential for employment in Ireland. The global screen tech sector is growing, and the technologies are converging.

The SIIL concept has the potential to become a home for all things animation, immersive and screen and an ecosystem for sustainable content production as well as research & development.

Key questions when considering such an initiative:

- Is there a need for a concept like this?
- How can this initiative contribute to solving the skills gap in the sector?
- Can SIIL stimulate research and development in screen technologies?
- Are there industry stakeholders that will support and drive it?
- Is there a viable business model and how can it be funded?

For this report, we consulted with over forty industry experts and agencies. The overwhelming consensus was that an innovation lab **is needed and makes sense**. They agree that these sectors do have enough in common, the technologies are converging and SIIL could:

- Help to build a community
- Educate and develop talent
- Test and demonstrate technology
- Undertake industry focussed research
- Be best in class for skills and facilities
- Be commercially sustainable in the long term.

SIIL could act as an umbrella space to drive innovation, enable collaboration, and support Ireland's ambition to become a global leader in the future of content. It would support business through innovative research projects and skills development for the Irish creative workforce. For SIIL to be successful, stakeholders from third-level, industry, government, and training agencies would need to be involved and supportive.

The screen industries (film, animation, games, AR/VR) are creative-led and tech-driven. Embracing technology at an early stage will help our screen and media companies gain a leadership position internationally. In the nineties, Irish companies like Jam Media and Brown Bag grasped technology quicker, enabling them to get ahead and grow into global studios. Technology offers the prize of increased productivity and faster production time – reducing the time from script to screen. That is what companies need now – the technology with the potential to reduce costs significantly and increase productivity.

While these sectors have great potential for further growth, they continue to suffer from a shortage of talent with most employers reporting difficulties in sourcing suitably qualified staff and crew. The changes in technological and people management in the industry are creating a need for a new skillset, particularly in the skills associated with animation, sound, immestive and digital screen technologies.

There are already significant facilities across Ireland in various companies and third-level institutions and there are several significant new facilities in the planning stage. There is also great work being undertaken by third level institutions and businesses across Ireland. These can be part of any new solution. The challenge will be to support the current players while addressing the gaps.

The objective of SIIL will be to stimulate more activity, raise awareness, foster talent, support companies to network and collaborate to build a community, provide test and demonstration opportunities, to educate and train. The strong focus on research and innovation will be of particular interest to indigenous technology businesses and tech multinationals. SIIL has the potential to contribute in a meaningful way to Ireland's attraction for FDI projects in these sectors.

While the focus is on technology, SIIL will also encompass creativity. SIIL will offer not just for equipment testing but for ideas – a crossover of science and the arts.

The aim is to create a hub that is best in class in terms of skills and facilities and one that is internationally recognised as excellent, one that will have an impact on supporting industry development and economic activity in Ireland.

A clear vision and a sharp focus will be important. If SIIL tries to be something to everyone, there is the danger that it will be too broad and without sufficient funding it could become insignificant.

Should SIIL be a standalone facility, or should it be aligned with another body – a third-level institution, an innovation or start-up hub, or a large company? Would the funds and resources be better deployed in supporting the existing training and educational institutions? All such the options are considered including the requirement to be financially sustainable. Any new facility will require funding and a viable long-term business model, otherwise, there is a real danger it will fail to achieve its potential.

2. What the Screen Industries Require – Survey and Expert Opinion

2.1 Methodology

This study involved three elements:

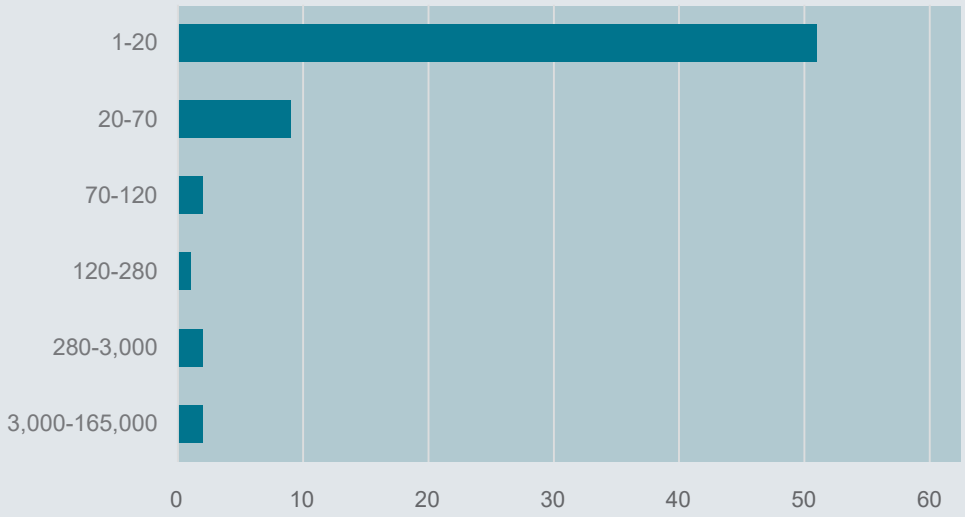
- A quantitative survey of screen, animation and immersive businesses in Ireland to understand their views on the need and priorities for SIIL
- A qualitative survey involving over 40 semi-structured interviews of stakeholders – companies, experts, academics, agencies etc., plus additional contributions from the three Skillnets and
- Interviews with overseas experts and organisations

Quantitative Survey	Qualitative Survey
From the TechIreland database of over 4,000 indigenous and MNC tech businesses we compiled a shortlist of companies that are part of the screen and related industries. TechIreland's database features 50+ indigenous companies that are building immersive technology products and 70+ game developers as well as other tech businesses. The three Skillnets also reached out to their networks, helping to compile information on freelancers, animation and design firms and services. In total, Ireland has more than 200+ businesses in the animation, immersive and screen industries. They collectively employ over 50,000 not counting freelance and indirect employment. The survey questionnaire [see Appendix 4] was sent to over 200 companies (indigenous and FDI). Survey Monkey was the platform. Valid responses were received from 75 SMEs and a small number of FDI companies. The survey was undertaken between December 2021 and January 2022. As agreed with the participating companies, only aggregate statistics and responses are reported, individual companies are not disclosed. The results from this survey are shown in Section 2.2 below.	The qualitative survey consisted of interviews with industry experts, CEOs, researchers, and media companies [Appendix 3 shows the list of interviewees and their backgrounds]. Most were recorded on Zoom and later transcribed. It was agreed that the participants' comments would be anonymized in the final report. The interviews followed a semi-structured format; introduction to the concept and initial thoughts, ideas on location, training, research, management and funding, interest in being involved, potential roadblocks etc., other reports or organisations that should be consulted. Altogether over forty experts were interviewed between 10th December 2021 and 1st March 2022. Many of the experts pointed to the recently opened virtual production facility at the Ulster University in Belfast. A short note is included describing the facility and some background information on Studio Ulster [Appendix 2].

2.2 Industry Quantitative Survey

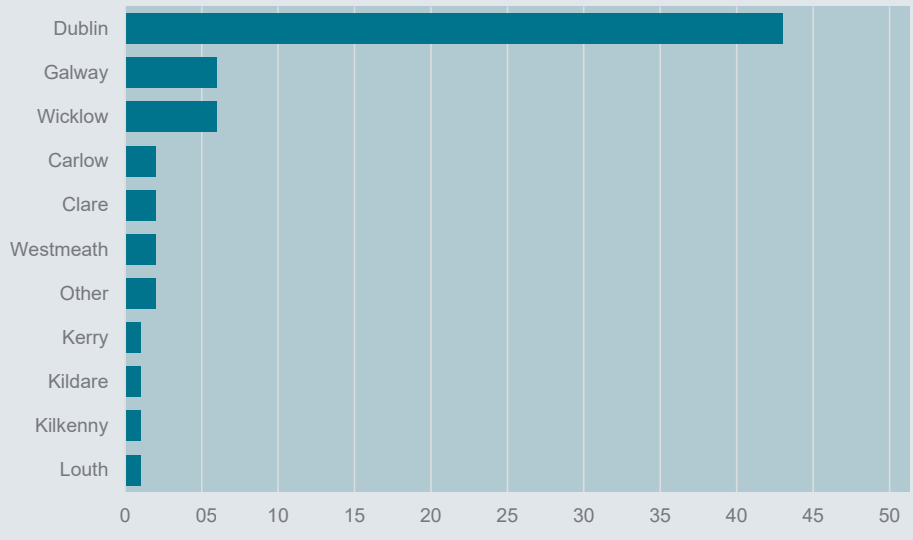
Company Size: The vast majority of companies surveyed employed less than 20 people with a couple of businesses employing 1,000+

Fig. 2.1 Company size



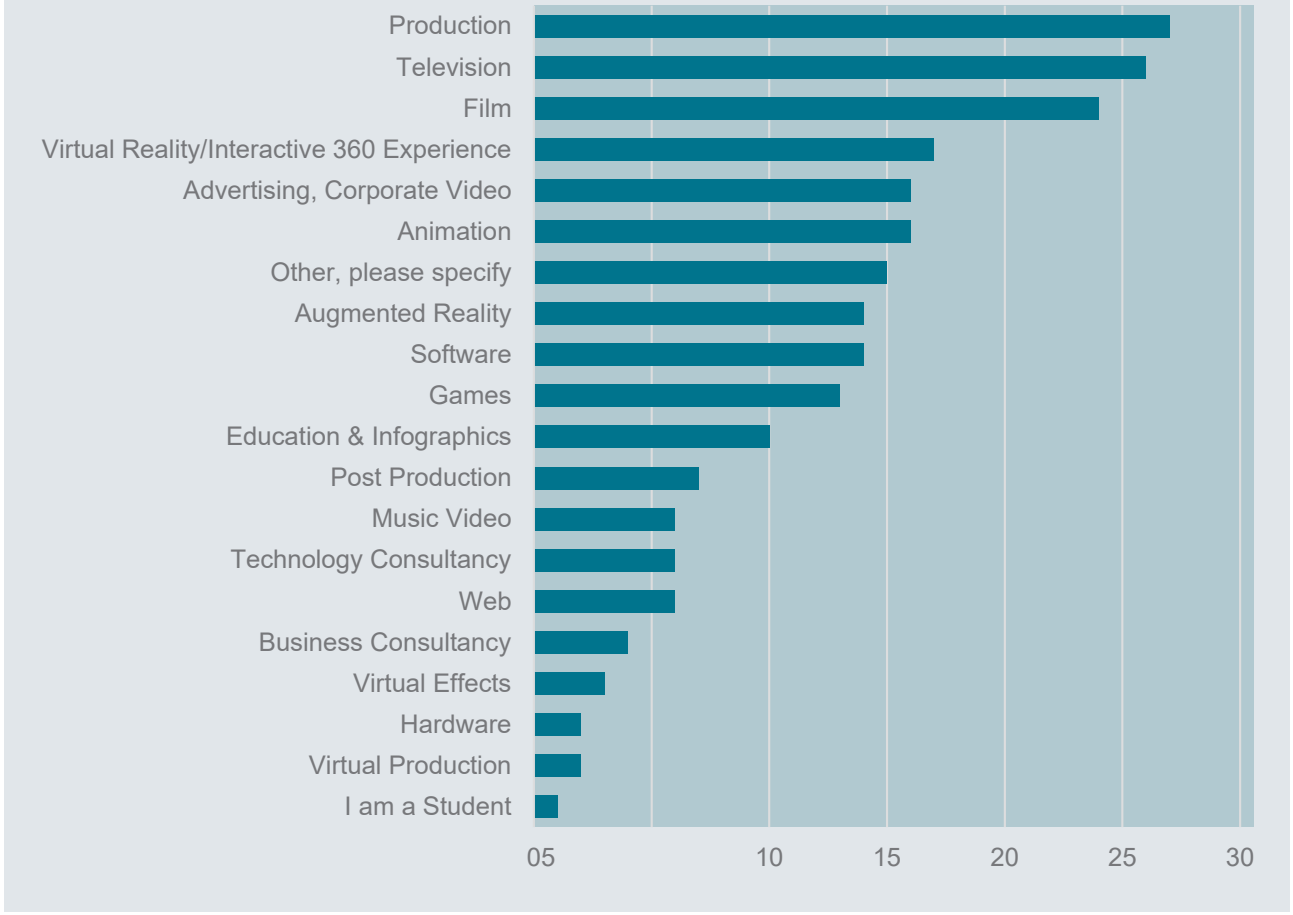
Location: Companies from more than 20 counties participated in the survey. A large majority of respondents are based in Dublin, followed by Galway and Wicklow.

Fig. 2.2 Location



Sector: Respondents selected one or more sectors/ industries they identified with. While the results are not mutually exclusive, they give insights into the scope of the various verticals.

Fig. 2.3 Sector

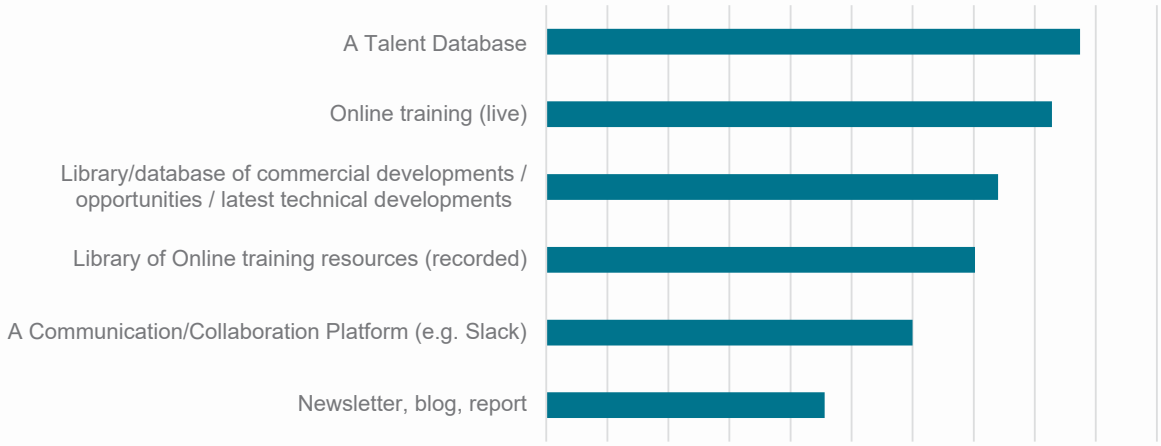


An Online Screen Innovation Lab

The first question concerned the relevance of the concept of an online SIIL. The overall response was extremely positive. 22% felt that SIIL could possibly be of some benefit. Nobody felt that SIIL would be of no relevance. When asked to indicate what would be the most important elements of an online SIIL, the respondents ranked a talent database as the first priority, followed by online training and a database of commercial information.

Over 80% of the respondents indicated that they would be likely to use online training provided by SIIL with 48% indicating that they would be very likely to use. 20% of respondents felt that online training would probably be of little interest, but nobody said it would be of no interest.

Fig. 2.5 Most Important Elements - *Rank in order of preference*



A Physical Screen Innovation Lab

The primary purpose of an physical SIIL was ranked as follows

1. Education, Space for workshops
2. Research and collaboration
3. Networking
4. Showcasing, Test, and Demonstration Space
5. Co-working space/accommodation for Startups and beachhead FDI
6. Equipment /facilities available for use/hire

When asked about film equipment for use/hire, a majority (56%) indicated that they would be likely to use such a facility, with over a quarter saying that they would be very likely to use. Another 25% indicated that it would be unlikely to be of interest, while 17% felt that equipment hire/use would be of no interest to them.

Fewer respondents expressed interest in having the latest game equipment (37%), but of those 15% claimed they would be very likely to use.

When asked about having AR/VR equipment for use or hire, 58% of respondents felt they would avail of this, while 40% felt this would not be of interest.

Location Preference for SIIL

1. Co-locate where screen industry companies are clustered
2. Co-locate with an existing Startup Hub (coworking space, innovation centre)
3. Co-locate with a film studio
4. Decentralised

Priority Equipment for SIIL

1. A sizable LED wall
2. Cameras and Tracking Systems
3. Some unreal stations/servers
4. Motion capture hardware
5. Photogrammetry studio and software

Summary

- Most companies in the sectors are small in terms of employment; 70% of the companies employ fewer than 20, and 16% employ 21-70. A few large companies employ the majority of workers.
- Production, film, advertising, virtual reality, animation, and AR were the sectors with the most responses.
- 75% of respondents think that SIIL is a good idea or is essential for the sector. None felt it would be of no relevance.
- The business case for SIIL.
  Responses in order of importance:
  1. Education and Training
  2. Collaboration
  3. Commercial opportunities
  4. R&D opportunities

2.3 Interviews with Experts and Practitioners

The experts, practitioners and researchers were unanimous that SIIL is a worthwhile concept.

- Experts agree that the technologies for animation, digital screens, computer games, and augmented and virtual reality are converging. While animation and games are more mature, immersive is probably the wave of the future and the Unreal engine platform is transforming digital studio technologies. The Irish games sector is small, but it is growing and will see significant expansion over the coming decade. Together, these sectors constitute significant growth potential for Irish jobs and exports.
- Several stressed the importance of ambition and scale and involving large companies and securing sufficient funding ("Smaller companies working from production to production can find it difficult to think of the bigger picture").
- It is important to be clear why SIIL is being developed. Is it to be a national commercial facility, potentially in competition with other commercial operations, or is this a piece of public infrastructure for research and training, for building the talent pipeline? It is difficult to straddle both options.
- Several experts emphasised the need for action "*If you wait to get full validation you are a follower*"
- While an online SIIL was welcomed, most experts believe that a physical element will be essential if it is to make a significant impact.
- All the experts suggest that the main objective in the short term should be training and talent development, including meetings, networking and demonstrations. In the longer term, research and innovation will be key. While all agree that the need is for relevant, up-to-the-minute skills, industry experts tended to focus on the need for short sharp competency-based skills. Smaller companies tend to see fewer requirements for research and higher-level skills, whereas these are more significant for large companies. In general companies lack awareness of current research activity and its potential to be a game-changer in the future.
- There are facilities and equipment across Ireland but there doesn't appear to be an up to date inventory of the current facilities and where they are located. A comprehensive mapping of existing facilities and equipment should be a priority for Phase 2 of SIIL, along with building the online community and mapping the existing resources and skills Animation Skillnet, Screen Skillnet and Immersie Technologies Skillnet are keen to source funding to support Phase 2 of SIIL.
- In addition to Ardmore Studios, Bray (*170,000 sq. ft of production stages) and Troy Studios, Limerick (100,000 sq.ft production stages*), there are also several major new studios at the planning stage:
  - Greystones Media Campus (*270,000 sq. ft. sound stages*)
  - Ashford Studios (Phase 2) (*170,000 sq. ft. sound stages*)
  - Ashbourne Studios (*88,000 sq. ft. sound stages*)
  - Grange Castle Media Campus, Clondalkin (*12 sound stages*).
  - Hammerlake Studios, Mullingar (*11 sound stages*)
  - All have plans for virtual production facilities, and all recognise the need for training and upskilling.
- There are also smaller digital studios in planning. The map of facilities is likely to change significantly over the next three to five years.
- There is general agreement that what has been achieved by Ulster University including its training facility (see Appendix 2) is very impressive.
- Concerning location, several possible options could work well - a university or a startup space or a film studio or a stand-alone.
- There were several suggestions that the ideal solution should involve a "hub and spoke" model that would network the existing facilities around the country, both public and private.
- There was general agreement on the importance of having the right business model with a clear policy on accessibility (who would use the facility) and properly resourced support and maintenance (since the technology is changing rapidly and equipment quickly becomes obsolete).
- Some industry practitioners voiced concern that a state-funded facility could have the potential to undercut private operators and thereby inhibit investment. This would need a policy to avoid unfair competition.
- Several experts suggested that the approach should be incremental – start relatively small and grow over time.
- A number pointed to the danger of over-specifying and over-scaling and not being able to get enough value out of the facility.
- The main costs will be the equipment and the building. The consensus view was that the equipment cost is likely to be of the order of €2-3 million [depending on the specification]. The cost of the physical building will depend on location and whether it would be a new build or an existing space. Building modification costs including screening for sound and light are likely to be significant.

If SIIL is to attract significant levels of stage funding its remit should also be to grow and scale companies. A partnership with Furthr (formerly Dublin BIC, the organisation that provides business consultancy to start-ups and scale-ups) could be useful as they have a long history of supporting start-up and scale-up companies in the creative industries, including managing the Guinness Enterprise Centre (GEC), which is/was home to many creative companies including Jam Media, Boulder Media, Brown Bag Films, Black Shamrock, Volograms and others. Furthr also oversees the three creative Skillnet training networks (Animation Skillnet, Screen Skillnet and Immersive Technologies Skillnet).

While there are likely to be funding opportunities from state and EU sources over the coming period, getting real industry contribution and commitment will be essential if the project is to attract public funding.

3.

Screen Tech is Growing and converging

The screen sectors are growing strongly[2][3][4] and this growth is projected to continue. The technologies are advancing and converging. It is a paradigm shift as games technology is colliding with film, where VFX artists are learning from people with computer games backgrounds and animation and games are converging. Digital technology is continuing to infiltrate the world of physical film production and has transformed the world of screen post-production and the world of immersive and VR.

The Screen industry is a major contributor to the Irish economy. The audiovisual sectors generated just over €1 billion in Gross Value Add (GVA) and 17,000 jobs in 2017[5]. 2021 saw a record-breaking spend of €500 million[6] in the Irish economy across feature film, documentary, television drama, and animation. This success is due to a combination of Ireland's competitiveness in attracting international productions, Screen Ireland's development funding and state supports for local producers and creative talent. International film projects have the potential for significant employment – Disney's Disenchanted, which filmed on location in Dublin and Wicklow, hired 98% Irish crew representing over 1000 jobs on the production.

Irish animation also increased 27% in 2021 after a decade of rapid growth that has seen the sector quadruple in size.

[2] Mordor Intelligence, Game sector growing at 9% CAGR, 2022. Gaming market growth trends

[3] KBV Research, Virtual reality market growing at 20% CAGR, 2020. Global-Virtual-Reality-Market

[4] Infiniti Research, Animation Sector growing at 23% CAGR, 2022. Global-Animation-and-Gaming-Market

[5] Olsberg•SPI with Nordicity "Economic Analysis of the Audiovisual Sector in the Republic of Ireland". 2017 Olsberg_Report

[6] Screen Ireland, "A record-breaking 2021" https://www.screenireland.ie/industry-insights

From the Irish industry perspective, animation is the leader in terms of achievement. Our animation industry has a huge reputation, it is famous, but it is still relatively small – 1,500-2,000 employees. Ireland is less focused on VFX. But there is increasing crossover. Animation, action movies, and games are all driven by physics engines.

The government's Audiovisual Action Plan[7] has the ambition to establish Ireland as a global Centre of Excellence for the film and TV industry.

Immersive is still very early days, it is still unclear how significant it will be, and what technologies will be needed, but we must assume that it will be serious. A recent report[8] by Skillnet Ireland indicates that our immersive technology sector is currently worth over €43 million, with significant growth potential as most businesses in the sector expect to grow in the coming 12 months.

Ireland has nearly 300[9] indigenous product tech companies in the screen, immersive, animation and design domains. These companies employ more than 7,300 across Ireland. One third of these jobs and over 120 companies are outside Dublin. In addition, there are hundreds of freelancers working as animation or game developers, production crew, makeup artists, editors, graphic designers, and others.

Thus, there are four verticals with some degree of connectivity. This is an opportunity to create a platform that connects all four. Cross-pollination between sectors is needed for content creation and technology. That only happens when people and businesses know who to contact and where to go.

Ireland is a small place, the sectors on their own are relatively modest but together they represent a significant opportunity for Ireland in terms of employment and economic activity. Furthermore, as a well-networked island, we can share knowledge to our mutual advantage.

Ireland is also home to a strong portfolio of multinationals that are active in the sectors, including Activision, Scopely, Adobe, Meta, Intel, Microsoft, Pond5, Avid, Allspark (previously Hasbro Studios), Riot Games among others, as well as tech giants like Google, Apple, Meta, Adobe and Microsoft. These companies are all potential sponsors or collaborators with SIIL.

[7] Department of Culture Heritage and the Gaeltacht, Audiovisual Action Plan, 2018 audiovisual-action-plan

[8] Eirmersive, Irish Immersive Economy, 2022 The-Irish-Immersive-Economy

[9] TechIreland data, May 2022

4.

Resources and Facilities across Ireland

While Ireland currently lacks a facility like SIIL, there are elements of SIIL in disparate locations across Ireland.

We are relatively well served with start-up space. There are now over 280[10] innovation hubs across Ireland – at least one in every county. Most of these have space for meetups, lectures, and networking, with meeting rooms suitable for classroom and online training programmes.

Many of our third-level institutions provide training for animation, film, games, and immersive. Each of these has a range of dedicated equipment and spaces for education, training and research. Appendix 1 shows fourteen institutions that provide relevant qualifications with associated facilities [this is not a comprehensive list]. However, there does not appear to be an up-to-date inventory of facilities and equipment and if and how they can be accessed. In the main, they are exclusively used by the institutions for their students or researchers without any facility for booking or renting by third parties. In general, there is a lack of awareness in industry of the research activity currently being undertaken [probably in part due to the disparate research facilities involved].

There is anecdotal evidence that there are private sector equipment and facilities that might be available for research or training, but without a database, they are impossible to access.

[10] The TechIreland database of innovation hubs is at https://www.techireland.org/hubs

5. Options for SIIL

There are several feasible alternative ways to establish and manage SIIL.

- It could be a standalone body, or it could be aligned or part of an existing organisation or institution
- It could be a purely online facility or [more likely], SIIL could have both online and physical elements
- Several geographic locations could be quite suitable

These options are explored in more detail below.

5.1 Stand-alone or with another body/ organisation

SIIL could be a standalone body, or it could be aligned or part of an existing organisation. The results from the industry survey suggested that co-location with companies is the preferred solution among companies in the sector, followed by co-location with a start-up hub/coworking space, followed by locating in a film studio. A completely decentralised solution had less appeal.

Surprisingly, locating with a Third Level Institute was the least favoured option [perhaps this is not so surprising since so few of the respondent companies had experience of undertaking research, but it does suggest a need to educate industry on the potential benefits of industry-focused research].

The experts tended to focus more on the smart screen, virtual studio aspect, and the facilities that would involve significant capital expenditure. Accordingly, they recognise the benefit of locating SIIL alongside a large film studio with strong links to third-level institution(s).

5.2 Online SIIL and/or a Physical SIIL

Many of the elements of SIIL can be delivered online – including some training, networking, collaboration, meetups, and building a community. These are all elements that are needed by the sectors.

An online SIIL was endorsed by 75% of the survey respondents and at least a similar proportion of the experts consulted feel that an online hub is a good idea. Many believe it it is essential for the sector. No respondent thought it would be of no relevance. The elements of an online lab that were considered most relevant were:

- A talent database: While this was mentioned by many, the exact details of what it might involve, how extensive it should be, how it would be populated, and how it would be quality controlled need further clarification. Moreover, Screen Ireland is currently building a skills database for the sector, until that is rolled out later this year, it makes sense to wait and see what is still needed then
- Online training: A wide range of online training courses are currently available through Skillnets and other providers. An online SIIL could act as a central database of what is available
- A library and database of commercial and technical information.

In summary, an online SIIL has widespread support and is something that could be developed without significant expense. It would help to bring the sectors together and build a community.

While an online lab could in theory be located anywhere or nowhere, it would make sense to have it based in an existing start-up or tech hub or research centre.

If the main objective is to have a space for the industries to mingle and network and attend workshops, a city centre location would be ideal. But large film studios are not located in the city centre. Any solution will involve compromises. Some interesting views follow:

- *These co-location options are all viable and lend something different to the offering.*
- *Education location or a research centre would be good, provided there is sufficient industry/commercial presence.*
- *A university that does lots of R&D would be ideal as the technology will be incorporated into curriculums and could incubate new startups.*
- *SIIL should be largely driven by industry but with a pipeline into academia.*
- *Partner with third-level institutions to share facilities, share space, and tie into a range of courses. All international examples involve universities for research, innovation, and talent.*
- *Involve the university in a neutral space rather than a university campus – it should be strongly industry-focused, and very outward-looking.*
- *Stand-alone does not make sense. Add-on is better with a community.*
- *You need a test and demonstration space, but avoid getting dragged into being a landlord.*
- *Locate on a studio campus, but a facility that is managed by a third-level institution.*
- *It should feel independent but draw on colleges, studios, and broadcasters, with management that knows the business.*
- *It should be a start-up tech space. This is industry infrastructure and so it should be industry-managed. The academic model is not accessible enough.*
- *It should be in a business environment but working with the best universities and industries.*
- *Not in a commercial studio since commercial work will push out research and training.*
- *If the lab were to have a commercial remit that could involve unfair competition.*

Some comments from industry experts below.

- *Build an online community first, they will decide what the priorities should be.*
- *Start online to get an idea of where the users are coming from, and what they are interested in.*
- *Online might be the best way to build a community on a limited budget. But online will still be costly and there will be a cost of ongoing maintenance.*
- *Every year the colleges produce hundreds of people, but there are no records of where they go. We need a database of our pool of talent for games or VFX or animation,*
- *It is important to map facilities and people and talent. We should have an inventory of the resources that are here to understand where we need to fill the gaps.*
- *It could be a hybrid space. On-site facilities but also some virtual rooms.*
- *A virtual community would be awesome for training, upskilling, next level, and filling the gaps.*

But there is recognition that an Online SIIL is not the complete answer.

- *Starting online makes sense, but I am not sure of the value if it is just going to be a website. The idea of a physical space is more appealing.*
- *A lot of training needs physical space, you cannot do it remotely.*
- *Online is great for tutorials for masterclasses, for instance, a seminar with someone in Los Angeles, but you need a physical space for meetups, serendipity, chats over a coffee, the sidebar discussions that are so valuable, the network that can only be developed face-to-face, particularly for those at a younger stage, it is important to build up a network in the industry.*
- *Online space is probably where to start and it is easier – but physical space is where ideas will get bounced around. Brainstorming will not work without face-to-face interaction.*

5.3 Geographic Location

We received a range of views on possible locations for SIIL:

- Dublin region, where most of the film, animation, games, and AR/VR companies are located.
- Galway, Limerick, Waterford, and Cork; all have the potential to be suitable locations. Each has several of the elements needed for success.
- Hub and spoke model with a central facility with a network of specialist satellites.

A city-centre location would be ideal for events and networking. However, a film studio campus would be attractive, if SIIL would involve a virtual film studio.

Many of the organisations consulted expressed the view that their facilities or location might be suitable for SIIL. These were all very preliminary comments on the feasibility of SIIL. Detailed discussions would be needed to explore the practical and financial implications of any location, but it seems there are several suitable locations, each with several potential partners [these and others] if the funding opportunity arises. Until there is a realistic source of funding, it makes sense to keep everyone engaged and informed.

Several experts suggested that a hub and spoke model could make sense:

- *It could build on the several facilities that we currently have across the island, helping to make them more efficient and modernize their offerings.*
- *Ireland is a parochial place, it will be important to pull the various players together and building an all-island consensus will be important.*
- *Government policy favours balanced regional investment.*

There are other views and options as evidenced by the following observations.

- *The industry is mainly in Dublin, that should be a starting point. You want to give people the best chance to drop in. Interaction with creatives is important.*
- *Not Dublin centre, but maybe Wicklow, North Dublin (M1 corridor) or Midlands (Athlone) or Troy in Limerick.*
- *Several of the larger tech start-up spaces would be ideal, many currently partner with hubs across the country and with universities.*
- *Base it near a studio with lots of production companies using it and space for small production companies around it.*
- *There are large empty industrial spaces across the country that could be ideal.*
- *Somewhere in Dublin Docklands would be great but it's hemmed in and rents high.*
- *One of the planned new studios, if they wanted it on their campus.*
- *Makes sense to approach a studio, or one that is being built and install alongside.*
- *The obvious cities are Dublin, Limerick, or Galway. Animation and production, games companies are spread across Ireland.*
- *The commercial sector in Dublin will take care of itself. We need viable careers in the West and the North.*
- *A decentralised model with an outreach. Many employees are and will be rural.*
- *Hub and spoke model. It makes no sense to replicate what is already there.*
- *Near studios in Dublin, Wicklow, Limerick. Wicklow Film Land would appeal most to us.*

6.

Funding and Management

As of now, there is not an obvious funding mechanism for SIIL, but there are some programmes that may prove fruitful. All would require significant private sector support.

The **Technology Centre** programme is a joint initiative between Enterprise Ireland and IDA Ireland. It allows Irish companies and multinationals to work together on market-focused strategic R&D projects in collaboration with research institutions. Technology Centres provide an ecosystem for collaboration, allowing large multinationals and small and start-up companies to work in partnership with academic researchers through topics identified as being strategically important by industry. New companies can join a Technology Centre at any time. Technology Centres would have the potential to raise the profile of the sector, and attract large company research, allowing Irish companies and multinationals to work together on market-focused strategic R&D projects in collaboration with research institutions.

SFI Research Centres are based in third-level institutions and aim to consolidate research through academic and industrial partnerships and secure non-Exchequer funding with particular emphasis on industry and EU research programs. They aim to make important scientific advances, enhance enterprise and industry, train students with critical, in-demand skills, support regional development, and enhance Ireland's international reputation.

Enterprise Ireland **Technology Gateways** work in partnership with Institutes of Technology and Technological Universities across Ireland. Consisting of 16 specialised Gateways and 3 sectoral clusters, the Technology Gateway Network delivers innovation expertise and solutions for the Irish industry.

Regional Enterprise Development Fund (2020 fund is now closed. It is unknown if it will be repeated) The Scheme supported major new collaborative and innovative initiatives that aimed to make an impact on enterprise development in the region/across regions and generate employment. The overarching aim was to stimulate enterprise development and job creation throughout Ireland. It sought to stimulate enterprise

clustering initiatives. The scheme awarded up to €5m funding to not-for-profit organisations towards capital and current costs, at a maximum grant rate of 80%. The remainder had to come from the sponsoring organisation. The competition for funds was intense.

Commercial opportunities: SIIL will have to be financially viable in the longer term through a combination of revenues from the rental of space and facilities, R&D projects from the state, EU, and industry subscriptions and contributions.

While everyone is in favour of a facility to foster the sector, ensuring that it will be commercially viable will be a challenge. We are not aware of a facility like this anywhere that can succeed without ongoing subvention, either as part of a third-level institution or as a facility alongside a tech business hub. Training programmes are very unlikely to cover the costs involved. If the focus is on commercial rental, the commercial use is likely to displace developmental or educational applications.

Getting a project like this off the ground will also require both financial and non-financial support from a whole range of companies and agencies as reflected in the following observations from the experts:

- *SIIL will need buy-in and leadership by the big organisations – the large media companies, the state agencies, and the large tech companies. It needs companies that are strong enough to lead, with resources to put into training, research, and development. Companies with clout, that want to innovate, a coalition that will get behind it.*
- *This is not going to get off the ground unless it has significant public and private backing, it must be both. The state will only support it if there is evidence that industry is behind this.*
- *You will need a few serious Corporate Sponsors; Tent Pole supporters, the likes of Large Studios, Multinational media companies, Large software and equipment companies, Leading immersive and animation studios, etc.*
- *The energy needed is immense. It will require people with the right DNA who have the energy and determination to make this happen and a chairperson who understands the limits of what can be done. It needs to be led by someone who is well thought of and successful in their own right, who can make a good business case and a board with strong credible people with similar values. The innovation manager must have a senior role to make an impact.*
- *Getting commitment. People are enthusiastic for the first meeting or two and then it lessens as people are too busy and cannot make it.*
- *Need to show it is relevant and timely; other centres failed because not enough companies bought into it, the technology was ahead of the industry, so they did not/were not able to use it. If the industry will not use it, it falls apart.*
- *The tax on streamers could be a source of funding; good for the sector and help Ireland Inc.*
- *There could be European Money; Universities are currently putting together a proposal for creative industries for a European fund.*
- *Look at The Hub festival in Montreal. An annual festival could be good for fundraising.*
- *If a virtual screen stage had facilities on par with what networks and studios require it could attract private investors since there is good demand and ROI.*
- *Look at the state-supported centres; 16 Technology Gateways, 10 Tech Centres, 10 SFI and over 100 Innovation hubs. This project will probably resemble a similar model.*
- *The scale of investment needed for something meaningful - €5+ million, would need matched funding [in cash and in-kind/ equipment/software] from industry.*
- *It will need a properly funded and credible business plan with good people to run it. Probably 10% overhead and it could be higher.*

6.1 Partners and Supporters

The SIIL concept has a lot of support from the industry. Many organisations have expressed a general willingness to be involved as evidenced by the following comments from the organisations consulted:

- *As a national media company, we are interested. This is innovative and new, and we are keen to promote people and skills development.*
- *As a tv broadcaster, we are positively disposed but would find it challenging to provide funding.*
- *We have plans to develop our facilities – a training and research unit could happen if the finances were available.*
- *We have building going on now, this could fit in if we could bring in revenue to cover costs. We are not in a position to fund, but if there was state money...*
- *We currently work with universities and TV production and local companies. A collaboration of interested parties might be possible and we might be able to leverage support from the EU.*
- *As a university department, we would like to be part of this conversation. The traditional university model is changing, we are becoming much more industry-focused.*
- *Our film studio project is awaiting final financing. We have a budget for training built into the investment. We are interested.*
- *Our ambition for our studio project is to be a catalyst for a national industry. This fits our vision.*
- *As a development agency, we are supportive of this concept.*
- *As a third-level institution with strong media courses, we want to be front and centre with this.*
- *We would be willing to support as a foundation partner, but not running day-to-day operations.*
- *This might fit in with our campus redevelopment plan and our research plans.*
- *This is something we are interested in, but until now we could not do much more than dabble – the day-to-day has kept us busy. We know it is on the horizon, we would like to know more and do more in that space.*
- *We supply software for the Digital Design, Media, and Entertainment industries. We would be willing to donate software licenses etc.*
- *If there is a specific proposal, we could bring some large companies to a round table.*
- *Very open to any JV or collaboration in the creation or ownership of the space.*
- *We would be comfortable working with partners to make this a reality. Preferably the state, perhaps third level,*
- *We provide Business Consultancy to start-ups and scale-ups and manage innovation space, it would make sense to involve us at some level.*

6.2 Facilities and Equipment

There is widespread welcome for the concept of a physical SIIL. The precise details of what facilities and equipment might be provided will depend to some degree on the funders, the funding requirements, and the budget available.

The survey of industry ranked the following activities as the most important; Education, Space for workshops, Research and collaboration, Networking, Showcasing, Test and Demonstration Space, Co-working space/accommodation for start-ups and beachhead FDI, and Equipment available for use/hire. Many of these can be delivered with general meetup and event space. However, training, workshops, and research space would require specialised and expensive equipment.

Concerning equipment for a physical facility, the industry survey suggested that the following should be the order of priority: Virtual production spaces, Motion capture hardware, Motion capture and photogrammetry studios, and Cameras.

The big current need is for virtual screen training facilities. There is general agreement that for the lab to make a significant statement about our ambition for the sector, a decent-sized virtual production space should be part of the plan. That could be alongside a third-level institution or alongside a film studio (current or planned) or alongside a start-up space (one of the current tech start-up hubs or another suitable space with an interest in taking on this challenge).

These are expanded in the following comments from interviewees:

- *Currently, if you want an LED of any sort you must hire it.*
- *You need a big space, soundproofed, lots of plugs for computers, good parking, good storage. If you have the space, people will bring their own gear. Accessibility is important.*
- *Keep in mind that equipment becomes obsolete very quickly.*
- *The lab should have a virtual production stage*

with high-end motion capture, and an LED stage to enhance animation. HoloLens 2, Epson smart glasses. Equipment library facility - to rent equipment. Gaming computers.

- *A combination of some form of multi-purpose event/ demo space. It should be flexible.*
- *A bunch of editing suites. Some form of dedicated lab or classroom space would be the minimum to start with where you can have a semi-permanent setup.*
- *Equipment involves huge costs and overhead. Be lean and hire in. Space is a better thing. Equipment could be redundant within three years, so it probably makes more sense to rent. If you want to capture a real-life training environment lease rather than buy.*
- *There is a perception that you get LED panels and Unreal Engine, and you are off to the races. The reality is very different – it takes a lot to run Unreal Engine, far more than just a bunch of rendering machines to output to your LED wall. We have a huge team that is responsible for the maintenance, development, colour science, storage capacity, media engineering, and development of software platforms that drive the unreal content that is playing back on those walls. It takes a village to set that all up.*
- *You could buy the latest video wall - a small 5x4m section but for Unreal technology and a wraparound screen it makes sense to hire, the tech is evolving so rapidly.*
- *In advance of a large hub or alongside it, there would be merit in a network of smaller units or mobile units. A small, mobile proof of concept model.*
- *Building mod costs are significant. In our case, the cost of structural mods was greater than for equipment - for fire safety, soundproofing, retractable seating, the roof, and ducting.*
- *Remember, maintenance costs are substantial.*
- *Under €5M would give you a volume studio or even a photogrammetry studio.*
- *€3 to 5 million - the minimum viable product is the training wall/studio at the Ulster University in Belfast now. It cost about €2M. This is ideal for training and small scale production and research.*
- *Centralised storage for the data, lighting grid, and stage.*
- *There are equipment and facilities across Ireland in third-level institutions already. There was a database, but it has fallen into disuse. Do an audit of what is where and see what the gaps are.*

Several experts suggested that the digital screen facilities at the Ulster University could be a useful model (see Appendix 2)

- *The forward-thinking is impressive. They identified a gap in the market. The full-scale Studio Ulster facility is some years down the line, but they recognised the need to prepare and to put something in place to train the workforce.*
- *They now have a volume stage with a sizable LED wall, they have a green screen space, they have camera tracking in the roof, they have three Unreal stations/ servers, and camera kits [since they run media courses] and it is there to be played with, they can break it, which is important for those kinds of facility. That kind of setup is a really good place to start, and it is sizeable enough to shoot a short film, and they could rent it if they have any capacity.*
- *They have incorporated the volume stage into multiple existing courses and new courses [gaming courses, animation, AR/VR, architecture courses that use Unreal Engine, etc. So, it is being used constantly and they can justify the cost.*
- *Because the tech is changing rapidly, servers are upgrading all the time. That is what is smart about Ulster University – they bought near the top of the range, but small scale, and they did not throw all their money at it since it is going to be superseded. The reality is that you cannot constantly update all the kit.*
- *I admire the vision – they aim to be a European centre of excellence.*

6.3 Training

Screen industries are sectors that are expected to grow rapidly over the coming decade, but the bottleneck is going to be in delivering the skills and talent needed by the industry – skills that are relevant and up to date that have been honed on modern facilities using the latest software and technology. SIIL could go some way to achieving this and help to network the existing training facilities and organisations.

Many of the comments from the industry experts support the findings of the Screen Skills Ireland Skills Needs Analysis[11]. In 2019, it found:

[11] https://www.screenireland.ie/imy ages/uploads/general/Screen_Skills_Ireland_2019_Report_vG.pdf

- A serious shortage of talent, with 88% of producers reporting difficulties in sourcing qualified crew.
- Technology is creating a skill gap. 92% of producers have identified a skills gap, many in technical skills such as animation and sound.
- While there is a shortage of tech skills across the film, animation, gaming and VFX sectors, , many employees want to upskill and they are prioritising ongoing and continuous learning throughout their lifetime to future-proof their skills.
- Although they recognise the value of short courses, there is a consensus that work is the best place to learn.
- Most recognise the benefits of academics and industry working together to design sector-specific formal accredited programmes.
- 87% valued on-the-job training especially in the technical areas, while 76% valued mentoring or shadowing.

SIIL has the potential to address some of the recommendations of the Screen Skills Ireland report, which focused on three main areas:

- **The need to develop capacity to compete internationally**

  Ireland has the ingredients to compete internationally, with a competitive tax regime and a successful co-production track record. We have experienced co-producers across film, television and animation. These sectors have the potential to create jobs and increase inward investment[12] For the Irish screen sector to compete internationally, to take advantage of the global increase in the demand for content and meet the standards required by the Streaming Video on Demand giants it will need to attract, develop and retain talented candidates. SIIL will make a powerful statement about Ireland's intention to grow a world-class industry here.

- **The need to build a sustainable talent pipeline**

  Large scale productions, animation, gaming and VFX companies compete for the same pool of talent. At the same time workers are prioritising ongoing and continuous learning recognising the need to take an active role in future-proofing their skills. Freelancers and employees value the role of academics in supporting their professional careers. SIIL has the potential to support greater cross-sector supports for upskilling all screen technology skills here.

- **The transition into industry**

  In common with other sectors, screen sector graduates lack some of the "work readiness" expected by industry[13]. While Section 481 Skills Development Plans have the capacity to deliver a positive impact on the person and the production, SIIL has the potential to contribute to the move from reactive just-in-time learning to proactive, planned skill development.

The recurring theme of these reports is the need to support the upskilling of the sector and the willingness of the education institutions to engage.

There is consensus that the primary support the sector needs is for modern training facilities that would be industry-focused [i.e. flexible and accessible with up to date equipment and processes]. There is also a need for more graduate and post-graduate programmes by Third Level and more focused courses to meet specialised skills gaps.

The combination of the training for digital screens and the availability of digital screen facilities seem to be a universally acknowledged gap.

Accordingly, it is recommended that the first phase of SIIL would be for Skillnet to convene an industry roundtable to clearly articulate the skills needs and gaps. It is difficult for the third level to keep up to date when technology is changing rapidly, but it is not impossible. According to the experts, some countries do it particularly well [Denmark, Spain, Canada], we can learn from them.

[12] Olsberg SPI, 2017. Economic Analysis of the Audiovisual Sector in the Republic of Ireland, https://www.screenireland.ie/images/uploads/general/Olsberg_Report.pdf

[13] Fitzpatrick Associates, 2018. Irish National Employer Survey , Higher Education Authority . https://hea.ie/assets/uploads/2019/01/21-01-19-J8961-Irish-National-Employer-Survey-Final-Report.pdf

Some useful comments by the industry experts below:

- *We must go abroad as we cannot find the critical skills even at entry-level.*
- *There is a massive skills gap. When we staff up for a job, 90% of the hires are coming from outside Ireland, from Spain, France, and Denmark primarily because they have colleges that are producing the skills needed by animation/VFX companies.*
- *Skillnets are doing a great job of plugging graduate skills gaps that really should be addressed at third level. This is something that we have been complaining about for a long time.*
- *Graduates from some other EU third level institutions have higher level skills than Irish graduates. This is something that needs to be addressed if Ireland is to compete internationally.*
- *Nobody coming from college is ready to come into the animation and VFX industry.*
- *These industries are going to require skilled software developers and coders and engineers. I cannot dip into our creative crew pool, even though they are brilliant, none of them can code a machine. So now I am on a creative set, and I need a coder.*
- *If we want to have an industry of scale, we must get a pipeline of talent. The colleges need to be able to produce the right people. It is a huge blocker for studios to expand and grow. The solution until now has been to import talent from around Europe.*
- *Training is the biggest concern for most studios. They cannot find skilled people - compounded by the cost of living, young people cannot afford it here.*
- *Third-level colleges around the county have facilities, but they are not producing operators who can use the latest technology - practical skills, learned by using the latest equipment and packages.*
- *Skillnet is great for people who are in work and upskilling.*
- *The boom-and-bust nature of the sector is a real issue, you train them too early and they do not get work, you leave it too late and there is a bottleneck.*
- *You need to have a real connection with the industry and be future-focused as opposed to reactive [it should be looking at what the industry will look like in 5-10 years' time].*

6.4 Research

Ireland is one of the leading Research, Development and Innovation (RDI) locations in the world[14]. We are 11th in the world for quality of scientific research, (climbing from 48th just 13 years ago). We have a good environment for companies to carry out successful and profitable RDI[15]. The aim of the Innovation 2020 strategy on R&D, science and technology is for Ireland to become a Global Innovation Leader. An unprecedented €8.2 billion is planned under the government's strategy for Science Technology and Innovation.

Enterprise Ireland and IDA offer significant financial support along with the 25% R&D tax credit designed to encourage companies to undertake new or additional RDI activity in Ireland.

Multiple research centres are located across Ireland focusing on RDI projects for specific key sectors, from ICT to Nanotechnology. None specifically focuses on the SIIL sectors and technologies, but several existing research centres (in particular the Adapt Centre, see box) have very relevant research programmes. They are potential partners for SIIL.

While there is significant funding available for research, the sectors represented by SIIL seem to be relatively under-represented. While hard data is hard to come by, few if any of the companies surveyed were engaged in significant research activities. This could be a lost opportunity and is something that will have to improve if Ireland is to achieve our ambition of having world-class innovative companies.

SIIL will serve as a focus and catalyst for added research activities in these sectors and technologies and afford opportunities to link with the other research centres and Third Level institutions across the island. For instance there could be an opportunity to link with the Adapt centre (see box) or one or more of the sixteen SFI Research Centres and eight Enterprise Ireland / IDA technology centres across Ireland, many with research programmes that could link with SIIL.

[14] https://www.sfi.ie/annual-report-2020/SFI-Annual-Report-2020.pdf

[15] https://www.idaireland.com/doing-business-here/activities/research-development-and-innovation

About ADAPT

ADAPT is the SFI Research Centre for AI-Driven Digital Content Technology. It brings together leading academics, researchers, and industry partners to deliver excellent science, develop novel solutions for business and train students with critical in-demand skills. Coordinated by TCD and co-hosted by DCU, ADAPT's partner institutions include UCD, TUDublin, Maynooth, Munster Technological University, Technological University of the Shannon and NUIG.

Sixteen SFI Research Centres

Eight Enterprise Ireland / IDA Technology Centres

6.5 The Business Case

The business case for SIIL is justified based on its commercial benefits:

a) Education and Training - there is an obvious need for facilities.

b) R&D opportunities - this is a sector that is missing out on R&D funding opportunities.

c) Commercial opportunities: There are potential industry supports to enable SIIL to grow.

Formulating a sustainable business plan will require further work. The potential funding options will also impose constraints on what will be required. A facility within a third-level environment would likely have lower revenue requirements, a not-for-profit will have different requirements, while a commercial operation would be different again.

Some expert views:

- *The business model will have to be built around R&D if it is to get significant support from EI and the industry. The value proposition will be important - a good elevator pitch.*
- *Most facilities like this must be subsidised by either corporate donations or from incubation space and desks – not an easy business model.*
- *Furthr's Innovation Exchange16 is a model worth exploring for SIIL.*
- *EI look for any project to be self-sustaining before they consider funding and would require clarity on:*
  - *Who would use it*
  - *How it will be used for research and innovation*
  - *Support and maintenance policy*
  - *A viable business plan to show how this will be self-sustaining*
  - *It should feel dynamic and appealing, marketing Ireland as a space for innovative screen technologies.*
- *Informality is good, but also you need KPIs that are formal and challenging, and industry collaboration is difficult [because of commercial sensitivity].*
- *A slow approach might be the way forward. The minimum viable product is training and education. You could show that having an impact in one year.*
- *Rent or Buy? For a training facility, it makes sense to buy better equipment in smaller quantities because the best will not be the best for very long. The big question is whether physical space must be commercially viable as well. If it is going to be expected to earn revenue, even if that is a relatively small proportion, it changes the spec. If it is to do commercial work the kit will need to be of broadcast standard. That is an important issue to resolve at the start.*
- *Be careful how you position this. If you pitch it as an incubator lab, it will only attract start-ups taking their first steps into the market. The very large production companies need to see the attractiveness of this. Pitch it to the large mature companies first.*
- *Avoid commercial conflict of interest and competition with private companies. "State funded operations can undercut businesses that people have worked hard to build".*
- *Keep conversation tight – to the group that will drive this without excess paperwork and bureaucracy.*

[16] Innovation Exchange is a multi-year programme to facilitate collaboration between Irish SME's and MNCs to boost innovation. It will support over 1,000 companies over 3 years. It is managed by Dublin Furthr in partnership with Skillnet Ireland. See more here https://theinnovationexchange.ie/

7.

Conclusion and Recommendations

SIIL is a worthy and worthwhile project that is sorely needed by industry and can contribute to several tech sectors that have great potential for growing Irish jobs and exports.

SIIL will focus on Training, Research, Information Sharing, and Collaboration, with physical and online elements.

There is widespread support for the concept and a nucleus of potential partners, both public and private, and from within academia and private industry, who are interested and might be willing to bring this to fruition. There is a task ahead; a project like SIIL will need to build a coalition of the willing. This is just the start, the next step is to build connections with relevant commercial, training and research organisations across Ireland and the shared island.

SIIL should consist of physical space(s) and an online, virtual hub. The physical space(s) should ideally be co-located with digital production training facilities and research facilities with accommodation for meetups, demos, training, and co-working.

The online element should focus on the meeting of minds, fostering a network for cooperation and collaboration and building a community – something that is currently lacking for these sectors that are converging but as yet quite separate.

Ireland already has significant facilities third-level institutions, research centres, and private facilities, with several more in the planning stage. However, there isn't a database of facilities and skills. This should be a task for the Online SIIL. A database is the first step in to facilitating sharing of resources and facilities.

Based on the discussions with industry and researchers, there are several options for where the SIIL might reside. It could be co-located with a third-level institution. It could be with industry (there were several suggestions that it could be alongside a film studio). It could be housed within an existing start-up/tech hub. Each option could be viable, each has attractions and potential limitations.

When it comes to geographic location, there are several possible alternatives, each with its merits and potential champion sponsor organisation(s). Several experts advanced the idea of a hub and spoke model with dispersed facilities linked to a national centre.

Funding will involve capital investment and ongoing operations that will need to be sustainable. All similar developments in Ireland and internationally involve state funding as an anchor with significant industry contributions. The experience here is likely to be similar. This report outlines some potential sources of funds, which could incentivise the industry to become involved.

At least in the medium term, SIIL will need to be financially viable, with a self-sustaining business model and with real industry involvement.

Training should be a prime focus of SIIL. While the screen industries are expected to grow rapidly over the coming decade, the bottleneck is going to be in delivering the skills and talent needed by the industry – skills that are relevant and up to date that have been honed on modern facilities using the latest software and technology. There is a serious shortage of talent, particularly in technical skills such as animation, digital screen and sound. There is also a recognition of the benefits of academics and industry working together to design sector-specific formal accredited programmes. The lack of training for digital screens and the availability of digital screen facilities seem to be a universally acknowledged gap. SIIL could go some way to achieving this and help to network the existing training facilities and organisations.

The other prime focus of SIIL should be Research. While there is significant funding available for research in Irish institutions and by companies, the sectors represented by SIIL seem to be relatively under-represented. Although hard data is hard to come by, few if any of the companies surveyed were engaged in significant research activities. This could be a lost opportunity and is something that will have to improve if Ireland is to achieve our ambition of having world-class innovative companies. SIIL could serve as a focus and catalyst for added research activities in these sectors and technologies and afford opportunities to link with the other research centres and Third Level institutions across the island

The next steps should involve strengthening the community network and building on this initiative. The proposed high-level conference later in 2022 is an ideal first step. In the absence of a significant corporate donor/investor, the following three phases are proposed.

Phase 1 Conference

The first step should be something that can start incrementally with a modest budget to "push out the boat". It could be an invaluable way to build the network and the coalition.

A good Phase 1 starting point would be for one of the Skillnet networks to convene an industry roundtable to clearly articulate the skills needs and gaps. Having these as part of the Furthr Festival17 could be ideal in providing a platform and visibility for SIIL.

Phase 2 Online SIIL and Identify Funding for the Physical SIIL

Building a social network takes time and resources. Skillnet Ireland could initiate this online community and offer support but may not be the appropriate organisation to lead it in the longer term. Incrementally, this online community could grow to include the following elements:

- ✓ Web portal for the Irish Screen Industries [something that is currently lacking].
- ✓ Network and communication channel [an active and lively communication channel can be invaluable in building a community].
- ✓ Social media [to build an engaged community].
- ✓ industry information [companies feel this is needed].
- ✓ Events information [these sectors are currently disconnected, but the technologies are converging – meetups and events will help to bridge the gaps].
- ✓ Inventory of the testing, research, and educational resources we have now [facilities and skills to undertake training, research, events – make them more visible to the wider community].

[17] Furthr Festival (formerly FutureScope) is a tech conference, focused on global challenges and the role of emerging tech in finding the solutions and facilitating ecosystem collaboration https://furthr.ie/event/furthr-festival/

- ✓ Education and training resources for the sectors [While many training programmes require modern physical facilities, there is still much that can be achieved online].
- ✓ Database of talent/skills [companies feel this is needed. After the Screen Ireland database is launched, it will be useful to consider whether more is needed].
- ✓ Network the current test and ed facilities including Northern Ireland [all-island dimension].
- ✓ Events, and meetups organised by the Hub.
- ✓ Identify partners once a funding opportunity is on the horizon, plan, and design.
- ✓ Secure the modest funds to undertake detailed feasibility and business plan [from EI or SFI or the relevant LEO, depending on the partners and location]. Any business model will have to be built around R&D and training with strong support from the industry.

Phase 3 – Physical SIIL

- ✓ With facilities for meetups, demos, training, and co-working.
- ✓ Linkage with research facilities, third-level research capabilities, and a virtual production studio.
- ✓ With buy-in and leadership by the big organisations that are strong enough to lead, with resources to put into training, research, and development.
- ✓ With a determined and energetic management team and a real commitment to innovation.

Appendix 1 – Academic Institutions and Key Agencies

Academic Institutions

1. Ballyfermot College of Further Education: Animation, Digital, Media, Sound
2. Dublin City University: Multimedia, Animation, Games development
3. Dundalk Institute of Technology: Immersive Technologies
4. Institute of Art, Design and Technology: National Film School, 3D animation
5. Letterkenny Institute of Technology: Arts in Animation
6. National University of Ireland Galway: Digital Media
7. Technological University Dublin: Film & Broadcasting , AR VR development
8. Technological University of South East,, Waterford and Carlow; Digital design and animation, TV and media production, Games development
9. Trinity College Dublin: Film, Computer Science and Statistics , Creative Arts
10. TUS, Athlone Limerick , Clonmel: Broadcast and film production, Digital animation
11. University College Cork: Interactive Media, Film and Screen Media
12. University College Dublin: Film and animation courses
13. University of Limerick: Games Development, AR/VR, Animation and motion design
14. Walton Institute: Immersive technologies

Key Agencies

1. Screen Ireland: Fís Éireann, the development agency for the Irish film, television and animation industry
2. Animation Ireland: Promoting Ireland's world-class animation sector
3. Skillnet Ireland: Supports business with subsidised staff training to advance innovation and growth
4. Eirmersive: Voice of the Immersive Sector in Ireland
5. Screen Producers Ireland: Support, advocacy and connections for independent film, television, animation and digital production companies
6. VFXAI: Visual Effects Association of Ireland promotes Ireland as a VFX hub of excellence
7. Screen Guilds of Ireland: Represents Irish Film and Television Workers
8. Enterprise Ireland: Support indigenous startups and scaling screen, animation, media and immersive technologies product companies with early stage, seed funding, mentoring and networking to be able to export out of Ireland.
9. IDA Ireland: Support FDI companies and international studios looking to establish research centers, screen and media labs and production facilities in Ireland
10. Furthr: Business know-how and creative training networks (Animation Skillnet, Screen Skillnet, Immersive Technologies Skillnet), GEC
11. Western Development Commission Supporting communities to grow, investing in businesses in the western region

Appendix 2 – Northern Ireland - Ambitious Studio Complex and Digital Screen at Ulster University

Studio Ulster

Studio Ulster is being developed as a world-class centre of excellence by Ulster University in partnership with the Belfast Harbour Commission and is supported by Northern Ireland Screen. It will create a unique blend of facilities to drive collaboration in R&D with researchers in Virtual Production from film, broadcast, animation, games and immersive, co-locating with screen production and technology professionals.

This large-scale Virtual Production studio complex with commercial Virtual Production stages, fully supported by an integrated R&D&I Centre of Excellence, aims to drive a revolution across converging sectors; film, broadcast, commercial, animation, games, immersive and VFX. It aims to be a 'Tier 1' centre of excellence in R&D and Innovation in Virtual Production. This €85Million [public and private] studio complex is currently being constructed.

At the core of Studio Ulster is a 7000m^2 facility comprising production and R&D and innovation capability as follows: (There isn't another facility with this combination of technology anywhere in the world [yet]):

- Virtual Production Stage I, which is a large-scale in-camera visual effects stage or 'LED volume' (of a scale benchmarked against the VP stage used in the production of Star Wars', *The Mandalorian and others)*,
- Virtual Production Stage II, which is a flexible and highly configurable hybrid green/blue screen studio with significant LED and camera tracking technologies.
- Motion Capture Stage with a large capture deck with 15m ceiling heights.
- 3-D Scanning stage for full body, facial and object scanning.
- Research and Development Smart stage with a suite of VP technologies to support research.

For more information visit studioulster.com
This major £72m state investment from the Belfast Region City and Growth Deal pillar innovation project strand, is supported by the Department for Economy. Their recent '10X Economy' strategy highlights technologies that will be key over the next ten years such as cyber, finance etc, - but also virtual production. The justification is not just film, but also about scaling up and levelling up N. Ireland games and animation industries and kick-starting a visual effects community ["part of the jigsaw that we really don't have here yet"]. The whole complex will be self-sustaining, with an anticipation that it will attract significant funding for research.

Phase 1 of the project, 7000M^2 space will open in late 2023 in the harbour in Belfast, beside the existing North Foreshore sound stages that are currently being used by Netflix.

Two years ago, when the full-scale studios were still a few years from completion, Ulster University recognised that this huge new facility will also need skilled people to staff it. Within a very short timescale, they have developed an impressive virtual screen training facility at Ulster University. This is described in the next section.

The Virtual Screen Training Facility at Ulster University

In 2021 Screen Academy at Ulster University announced an investment in a new Virtual Production Facility at its York Street Campus in response to the real-time revolution taking place across film, television, games, and animation. This coincided with achieving Unreal Engine Academic Partner status with Epic Games (creators of Fortnite and Unreal Engine, the real-time 3D tool) endorsing the Ulster University's games design, screen production and animation courses. The Virtual Production facility was officially opened by the DfE Minister in February 2022. The studio was part-funded by the Department for the Economy's Higher Education Research Capital (HERC) Fund.

The state-of-the-art facility includes an LED wall with camera tracking technology, full-body motion capture, facial capture, a large green screen and virtual cameras. It also includes a tracked simulcam stage. The cost of the Virtual Production Studio was £1.6million, which included £1.2million capital cost and £0.4million in building modifications.

Dr Declan Keeney, Director of Ulster Screen Academy, explained, "The new facilities will support our ambition to offer the most relevant and agile degree programmes offered anywhere in the UK and Ireland, responding to the 3D and real-time skills gaps identified by our industry partners. We have embedded virtual production into the curriculum, teaching high-end production skills for games design, animation, film and broadcast. The new facility will also support research in virtual production for the screen industries. Our graduates are highly sought after by the industry. The city deal investment will generate new jobs in Northern Ireland that require specialist digital skills and our students will be ready for them.

The facility at Ulster University in York Street

- Dedicated Film/TV Studio with green screen infinity curve and B&W cyclorama
- Partnerships with key firms such as Epic Games (Unreal Engine), Canon, ARRI, Aputure, DJI Ronin (equipment), Adobe (software), Zero Density,
- Lighting Grid with pantographs/substantial lighting equipment and accessories
- 2 No. 38 seater computer labs with Adobe Creative Suite and other software such as Maya, ZBrush
- Ten dedicated edit suites
- Screening Room with 4k projector and Dolby 5.1 surround sound
- 4k ATEM Live multi-camera broadcast facility
- Live Broadcast capability
- In-camera Visual Effects Stage
- Simulcam Stage running Zero Density
- Brain-Bar compute running networked A6000-based computers
- Camera Tracking from Mo-Sys and Vicon

This size of virtual screen is ideal for training in that it has all the facilities, walls, test facilities, test beds, tracking facilities, different types of tracking, motion capture cameras and software etc. With opportunities for directors of photography (DOPs) to start to work through colour pipelines (it's difficult to find DOPS that understand colour science] and give them opportunities to learn how to use Unreal to get content onto walls, how to set up the networking, how to set up the routing, how to get the cameras, how to calibrate the tracking, how to physically build the walls, There is a lot of software needed and a lot of training how to integrate, how cameras work.

There are no virtual production facilities on the island now. It's my objective in N. Ireland to accelerate the industry and build capacity here. We are determined to build our local industry and do a lot more. For instance, we had a film production company here last week – we came up against more technical problems than we solved, but we pushed out the knowledge and on foot of that they already have business building worlds etc. knowing how to optimise their assets here.

We need to build a multi-faceted ecosystem because it's not only about equipment companies like NEP or LUX Machina. ILM has had to start their own academy because staffing production is challenging, and it involves retraining and refocusing its own people as well as new ones. They are asking, "but where will we get the people?" So, skills development is driving a lot of what we do. And Ulster University will be fully integrated into the commercial studio complex that is being built at Studio Ulster.

We are also working with youth groups, real diversity across the other education providers, and creative digital apprenticeships, we need FE, higher education, all range of skills.

What we have built here in York Street has all the equipment we need [and we will build more training facilities like this] to train, to teach the mechanics, to build worlds, to optimise worlds. If you are building training facilities you can do courses back to back and have a full house most of the time.

We also have our campus in Magee, but we don't have partnerships in 3D and real-time space with institutions in Ireland yet. We are very keen to connect across the shared island, there is a narrative we want to build on."

Some observations from Dr Declan Keeney, Director of the Ulster Screen Academy at Ulster University

- *It was important to get the right people on board. You do need tech evangelists who can promote to an audience that doesn't want to get left behind. The university understands the sector and the potential and how many jobs this will deliver -well-paid jobs [not always the case in this sector] and it understands how to deliver large-scale publicly funded projects. It wouldn't have happened without support from politicians who were able to engage with departments, to get them to understand the proposition, and realise the value and the deep learning.*

- *We had to bring everyone on board, university, government, Screen DFE, DFC, Harbour commissioners, industry. Once they understood the potential, they got behind it.*

- *This could have been given to a large private investor, but it would be a closed, technology eco-system. We wouldn't get to grow the capabilities and spread the benefits to the wider tech community here. Large companies will rarely disclose their production pipelines, but SMEs have to democratise. This way, with public money, we will engage with the broad industry and in time see the growth of the private sector, with a healthy and sustainable talent pipeline and a reputable ecosystem.*

Appendix 3 – Experts Consulted for this Report

Over 70 film production, animation, games, and immersive technology companies were surveyed as part of this study. The following more than forty experts were interviewed and many of their comments are included in the report.

We were also fortunate to have an expert Steering Group who met four times to review progress. The members of the Steering Group are marked with an asterisk

Alex Cook & Chris Pape	*Innovation Manager at Digital Catapult NETV | PROTO | Programme Manager: Immex City | Supporting immersive technologies sector in the Northeast England*
Anil Kokaram*	*Head Of Department, Electronic Engineering, Trinity College Dublin. Video DSP Research and Development*
Barbara Deignan	*Network Manager, Screen Skillnet (training for Film, TV and Postproduction)..*
Bill Malone	*Director of Content, Virgin Media Television*
Brian Gilmore	*Animation Technology Consultant and Academic Leader for CGI Technical Artist Apprenticeship, TU Dublin.*
Camille Donegan*	*Independent XR Producer | Creative Director at SolasVR. Founder Eirmersive*
Ciaran Gilsenan	*COO at Dogpatch Labs.*
Colum Slevin*	*Senior Director, Positive Play Group at Electronic Arts, (EA) California. Previously Director of AR/VR Media, at Facebook*
Connor Harrington	*Commercial Officer, Giant Animation. Founder of media campus project for a 50-acre site in Greystones.*
Dan Ring*	*Head of Research at Foundry, Foundry develops creative software for the Digital Design, Media, and Entertainment industries*
Declan Keeney	*Director of the Ulster Screen Academy at Ulster University.*
Declan McKibben*	*Exec director, ADAPT Centre, TCD, the SFI Research Centre producing ground-breaking digital media innovations.*
Dermot Horan	*Director of Acquisitions and Co-Productions at RTE, and Vice President EBU TV*
Donal Travers	*Head of Technology, Consumer and Business Services at IDA Ireland*
Eamonn Sayers	*Manager, Guinness Enterprise Centre, Founder Global Sports Team*
Elaine Geraghty	*Managing Director Ardmore and Troy Studios*
Eliza McLaughlin*	*Creative Producer, High Res, a company specialising in virtual production, lighting, projection mapping & interactive systems for TV & Live event*
Fernanda Parente*	*Rosy DX, Berlin and lecturer in Converging Tech Trends at University of Applied Sciences for Media, Communication and Management, Berlin*
Fiona Kilkelly*	*Consultant in AR, VR, Co-Founder XR Health Alliance, Chair Eirmersive, Founder Immerse UK*
Gareth Lee	*Skills Manager at Screen Ireland and manager, Animation Skillnet. Previously Ballyfermot College of Further Education*
Gearoid Mooney	*Division Manager for Research and Innovation, Enterprise Ireland*
Greg Maguire*	*CEO, HUMAIN, Belfast and Professor of Animation, Ulster University. Previously with many animation companies.*
Hilary Kenna*	*Researcher, lecturer in visual and UX design at IADT, Dun Laoghaire.*
James Farrell	*Head of Technology, Consumer and Business Services at IDA Ireland*

James Morris	*Promoter, media park for film and TV, at Grange Castle. Previously Windmill Lane Studios, The Mill Facility, Chairman of TV3, Chair of The Irish Film Board.*
Jessica Fuller	*Consultant, Sustainable Enterprise Creative Economy at Western Development Commission*
John Brady*	*VP Production Technology and Workflo at Brown Bag Films (television CGI and animation studio owned by Canadian 9 Story Media Group)*
John Phelan	*Director, HBAN, Furthr, Animation Ireland,*
Laura Livingstone*	*VFX Manager - Series at Netflix (Los Angeles, US), previously postproduction manager at Meta and Disney+*
Leonard Hobbs	*Director, Research and Innovation at Trinity College Dublin*
Mike Bolan	*Studio Manager, Troy Studios, Limerick*
Niall O'Callaghan	*CEO at Limerick Enterprise Development Partnership, undertaking a feasibility study for a virtual studio. Previously with Shannon Development and IDA.*
PJ Mathews, UCD	*Director, Creative Futures Academy, UCD*
Rachel McDonnell*	*Associate Professor in Creative Technologies, School of Computer Science and Statistics TCD.*
Richard Barnwell	*General Partner, Delta Partners VC. Previously head of studio at Scopely Games after it acquired Digit Games, the Irish games company he founded,*
Richard Chaney*	*Creative Director, Piranha Bar, Dublin. Creative Production Studio - originating creative content from live-action to animation and all cross-platform media*
Rónán Ó'Muirthile	*Head of the Faculty of Film Art and Creative Technologies at IADT. National Film School,. Filmeu - European Universities Alliance for Film and Media Arts*
Stephen Brennan	*The Digital Hub, Head of Strategy & Partnerships. Chief Digital Advisor to Government.*
Stephen Murnane*	*Manager at Tyrell Corporation, technology solutions provider for the broadcast and post-production, sectors in the UK and Ireland.*
Susan Talbot	*Network Manager, Immersive Technologies Skillnet. Producer at Good Looking Films,*
Trevor Ó Clochartaigh	*Director of Operations and HR at TG4*

Appendix 4 – Survey questionnaire

Company Name: **No. Employees (full-time):** **Your Name:** **Your Role:**

1. Your Company sector (tick all that apply):

• Film • Television • Post-production • Virtual Production • Animation • Games • Virtual Effects	• Virtual Reality/Interactive 360 Experience • Technology consultancy • Business consultancy • Production • Hardware • Software	• Web • Advertising, corporate video • Music Video Music Video • Education & Infographics • I'm a Student • Other (describe briefly)

ONLINE Screen Industries Innovation Lab

1. Does the concept makes sense for your industry sector (tick the box)
2. What are the most important elements of a VIRTUAL LAB (tick all that apply)

• Library/database of commercial developments/ opportunities • Library/database of technical developments • Library of Online resources (recorded) • Online training (live)	• Collaboration Platform (e.g Slack) • Newsletter, blog, report • A Talent Database • Other

3. How likely is YOUR COMPANY to avail of possible elements

• Library/database of commercial developments/ opportunities • Library/database of the latest technical developments • Online training resources (recorded)	• Online training (live) • ·Communication Channel (e.g. Slack channel) to learn, build, collaborate • Other

PHYSICAL Screen Industries innovation Lab

4. Does the concept of a physical screen industries innovation lab makes sense for your industry sector

5. What should be the primary purpose of the PHYSICAL innovation lab:

• Education, Space for workshops, • Research and collaboration • Equipment available for use/hire • Showcasing, Test and demonstration space	• Networking • Co-working space/accommodation for startups and beachhead FDI projects. • Other (describe briefly)

6. How likely is YOUR COMPANY to avail of possible elements

• Equipped with the latest **FILM** production equipment for use/hire • Equipped with latest **GAMES** production equipment for use/hir • Equipped with the latest **AR/VR/Immersive** production equipment for use/hire	• Test and demonstration space for immersive experiences ideas, Workshops and training • Onsite technical support, mentoring • Co-working space/accommodation for startups and beachhead FDI projects. • Demonstration and event space for talks, lectures, networking etc

7. Best LOCATION for a physical screen industries innovation lab (rank)

• Co-Locate with Third Level research institute • Co-locate with an existing Startup Hub (coworking space, innovation centre) • Co-locate with a film studio	• Co-locate where screen industry companies are clustered • Decentralise around the country • Other (briefly describe)

8. EQUIPMENT for a physical screen industries innovation lab (rank)

• Virtual production spaces • Motion capture and photogrammetry studios • Video and audio editing suites • LED for Film • LED for Marketing • Motion capture hardware • Cameras • Editing	• Storage • Haptic gloves, • Motion capture suit • Pupil tracking • Holographic display hardware • Unreal Engine Software • Other

9. The business case for the Screen Industries Innovation lab (rank)

• Commercial opportunities • Education & Training opportunities • R&D opportunitie	• Collaboration & Networking • Other (Please specify)

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Prepared by:

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