

Digital Transformation in the Screen Industries

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Animation, Screen, and Immersive Technologies Skillnets provide subsidised talent development solutions to the Animation, Screen, and Immersive Technology (Games, VR/AR VP etc.) sectors in Ireland through high-end, bespoke upskilling initiatives that are designed and delivered by industry specialists. The objective of Animation Skillnet is... *to expand the capabilities of Irish businesses working in the animation sector through subsidised learning and development programmes.*

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Foreword

Digital transformation is one of the most significant challenges facing businesses and workers here in Ireland - and globally. This trend of acceleration post-pandemic is impacting every sector and every organisation, and redefining job functions. For Ireland to continue its role as a global leader in the creative screen industries, it is vital that the talent base reflects not just the current business demands, but also the challenges of future growth in existing and new markets.

This report outlines the opportunities and challenges of digital transformation within the Irish creative industries sector and provides five case studies that will support companies within the sector to compete, transform and drive future competitiveness. It's difficult to overstate how important talent is in supporting this shift towards digitalisation. Business models are changing fundamentally and to survive, grow and innovate, investing in and supporting talent to meet these changes is critical to future success for the industry, particularly one where there is so much international competition. This report highlights the agility of companies operating in this space in Ireland and will no doubt provide inspiration for others in the industry.

I would like to acknowledge all of those who contributed to this research report. Particular thanks are due to the many enterprises, employees and stakeholders who contributed their time and efforts. I would also like to express my thanks to Strategic Innovation Partners. Finally, I would like to thank Animation Skillnet, Immersive Technologies Skillnet and Screen Skillnet for managing and leading this innovative study to a successful conclusion.



Tracey Donnery

Director of Communications & Policy



1

Introduction

One of the latest technological breakthroughs in the film industry has been the advent of digital technologies which have impacted many areas of film production, distribution and consumption.

(Chapain and Stachowiak, 2017, p.72)

Over recent years, the screen industries in Ireland have cemented their place at the cutting edge of creativity and innovation. From major global television and film productions through to award-winning animations, the creative screen industries in Ireland have continuously pushed the boundaries of technological and creative possibility.

This report provides a number of action-oriented case studies on the impact of digital transformation on the future of work in the creative screen industries in Ireland. By examining the way in which a number of leading organisations have integrated digital technologies, solutions and approaches into their operations, it is intended that a better understanding of both the opportunities and challenges will emerge. This is most particularly against the backdrop of the COVID-19

pandemic and pressures which were brought to bear on organisations of all types. While the impact of the pandemic cannot be underestimated, in many ways it acted simply as a catalyst to accelerate and consolidate existing digitalisation trends.

Taken together, these case studies will:

- ▶ Explore pre-existing digital and online processes and tools that have been developed further due to the pandemic
- ▶ Identify more recent innovative digital and online practices, where they originated and how and why they have been adopted by the organisations studied
- ▶ Measure the impact of these digital processes and practices on teams and the sustainability of their use locally and on a wider scale across the screen sectors

It is intended that this report will support a cohesive and consistent approach to the future of work in the creative screen industries in Ireland into the future as organisations continue to grapple with the challenges and opportunities of digital transformation.





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Understanding Digital Transformation

In recent years the pace and intensity of digital change and transformation has accelerated. While already a long term trend, this process was given much greater impetus by the advent of the COVID-19 pandemic (McKinsey, 2020).

When defined most broadly, digital transformation can be understood as:

the process by which companies embed technologies across their businesses to drive fundamental change.
(Accenture, 2022)

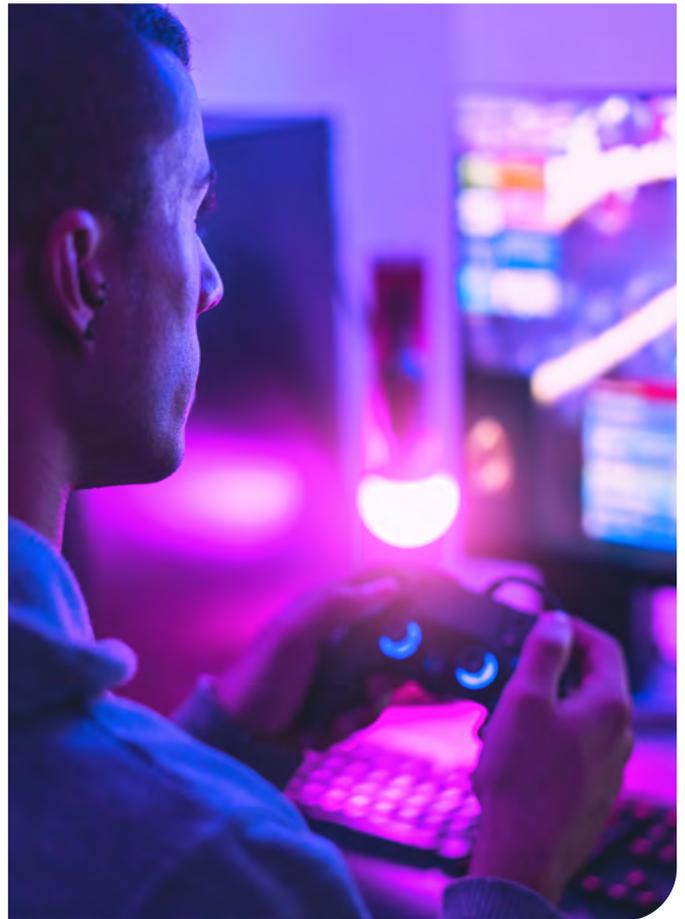
Central to this transformation is the enhancement of digital capabilities within an organisation. As Harbert (2021) asserts: “Digital capability empowers organizations to not only enhance existing processes and products, but improve or even create new business models.”

A key impact of these trends has, consequently, been on the way in which organisations go about their business and undertake core tasks, and the capabilities which they require to do so successfully. Indeed, in outlining the key elements of successful digital transformation a 2011 report by the MIT Center for Digital Business and Capgemini Consulting emphasised that:

Successful digital transformation comes not from implementing new technologies but from transforming your organization to take advantage of the possibilities that new technologies provide. Major digital transformation initiatives are centered on re-envisioning customer experience, operational processes and business models. Companies are changing how functions work, redefining how functions interact, and even evolving the boundaries of the firm.

(MIT Center for Digital Business and Capgemini Consulting, 2011, p.5)

This perspective also brings into sharp relief the importance not just of implementing new technologies, but also of learning and applying new, digital skills and of developing what Neeley and Leonardi (2022) label a **digital mindset**. This focus on skills and upskilling as a foundation



for digital transformation has also been recognised in Ireland (Amárach Research, 2022) and in that sense is very much a global phenomenon.

Yet the impact of digital transformation goes far beyond processes, structures and customer offerings, and can change the very nature of an organisation and the way it does things. This includes more practical aspects such as the way that meetings are held (Reed and Allen, 2022), through to new approaches to leadership and management (Westerman, 2022) and reimagining organisational culture (Lund Petersen, 2022).

Digital transformation is, consequently, not just about the implementation of new technologies but rather the complete transformation of what an organisation does and how and it does it.



3

Digital Transformation in the Screen Industries

The history of film is full of advances that have changed the seventh art ever since, both in the way it is produced and in the way in which the public has enjoyed it. From the first Lumière brothers projections to modern computer-generated graphic films, the industry has not stopped innovating to make better films.

(Bernardo, 2016)

Where once upon a time images were captured on celluloid, stored in canisters and distributed on physical reels, the modern screen industries – whether live action or animation, television or film, VFX or immersive technologies, games and other areas – are underpinned by digital technologies and capabilities they bring. Core to this has been an ongoing process of digital transformation over many years which has fundamentally changed the way things are done.

Kretchmer and Khashabi (2020) highlight the impact that digital technologies – specifically analytics – have had on project commissioning. They cite the example of Netflix and their use of data analytics to justify the commissioning of the highly-successful **House of Cards** remake in 2011, based simply on subscriber viewing data rather than a more traditional pilot.

Similarly, traditional and even more recent models of distribution have been disrupted by the growing impact of digital and the shift from theatrical release to video and DVD and now to streaming (Solidoro and Viscusi, 2020).

A key consequence of this trend in the screen industries is a shift from a supply-led model controlled by studios and distributors, to a demand-led model where consumers have much greater say on the media they engage with, and where, how and when they do so. Solidoro and Viscusi consequently propose that:

Film distribution is turning into a demand-led market, instead of a supply-led one. Thus, film distributors can now create new release models to better respond to consumer demand, leaving behind the restrictions of traditional distribution systems and changing the relationship between the elements of the film value chain. This is going to change the traditional production function, co-creating values across borders and re-defining the role of intermediaries (agents, distributors), gatekeepers (cinemas) and experts (critics, influencers) as effects of digitalization on the film industry.

(Solidoro and Viscusi, 2020, p.240)

The impact of these trends has been accelerated by the COVID-19 pandemic as data from various markets on falling box office takings (Rubin, 2021) and changing audience for at-home versus in-cinema releases attest (Statista, 2022; Navarro, 2021).

The pandemic has also had a significant impact on production in the screen industries. A 2021 report by **Variety Intelligence Platform** on the impact of digital transformation on virtual production effectively highlights the interchange between new and pre-existing digital innovations:

The COVID-19 pandemic could have paralyzed production on film and television. But even though so many shoots had to be suspended over many months, Hollywood was still able to get some boundary-pushing work done.

Thanks to innovations already set in motion in recent years, directors and producers were able to bring teams together and work with ways and means unimpeded by the traditional creative limits of time and space...

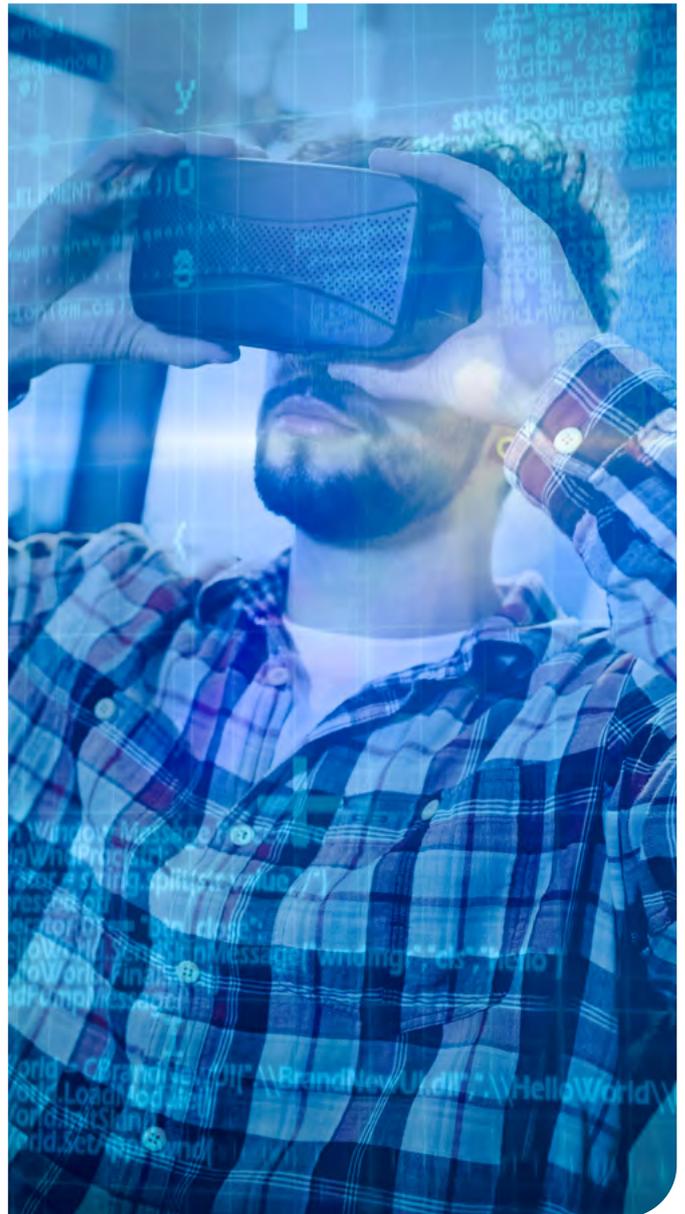
While these innovations are still in their infancy, the pandemic accelerated their development to the point where they are having implications for content creators for many years to come.

(Longwell, 2021)

That report specifically highlights 6 key digital transformation innovations which have significantly impacted on virtual production:

- ▶ **LED Volumes:** Walls of high-resolution video screens powered by video-game engines that can serve as backgrounds instead of real locations (as seen in “The Mandalorian” on Disney+)
- ▶ **Motion Capture:** Recording human or animal physical movements using data to animate onscreen characters
- ▶ **Cloud Collaboration:** The sharing of production assets on cloud storage sites
- ▶ **Chroma Key Compositing:** Shooting scenes in front of coloured backdrops that can later be replaced with CGI imagery
- ▶ **Selfie Shoots:** Camera packages sent to actors that can be remotely controlled by technicians
- ▶ **Artificial Intelligence/Machine Learning:** Algorithms that can automate editorial tasks or generate unique behaviours in CGI imagery (Longwell, 2021)

Digital transformation is, consequently, a key aspect of the screen industries globally now, and will become even more important over the coming years.







4

Digital Transformation in the Irish Screen Industries

The Covid-19 pandemic has spurred a shift to digital technologies in a short period of time as businesses scrambled to find ways to keep operations going amid lockdown restrictions. More than 80 per cent said they were compelled to accelerate the adoption of digital services and technologies faster because of the pandemic.

(O'Brien, 2021)

While trends in digital transformation vary between sectors and from country-to-country, Ireland has by no means been immune to this change. Although traditionally regarded as a potential threat to jobs, most particularly those in low-skilled occupations (Expert Group on Future Skills Needs, 2018), more recent experience during the COVID-19 crisis has shown the power of digital transformation and emerging technologies to support business continuity during a time of crisis and challenge.

The adoption of digitalisation/automation is happening gradually in Ireland and this slow but steady progress is expected to continue.

(Expert Group on Future Skills Needs, 2018)

When considered more broadly, the importance of digital transformation for Irish industry has been recognised through Harnessing Digital – The Digital Ireland Framework. This initiative, seeks to position Ireland as a digital leader, driving and enabling digital transformation across the economy and society.

It is set out across four core dimensions, which are in line with the four cardinal points of the EU's Digital Compass: Digital Transformation of Business; Digital Infrastructure; Skills; and Digitalisation of Public Services, and this is supported by a modern, cohesive, well-resourced regulatory framework.

(Government of Ireland, 2022)

As with the broader international context outlined above, digital transformation is having a significant impact on the screen industries in Ireland. In recent times, for example, the importance of virtual production has been emphasised by the establishment in early 2022 of a Virtual Production Academy by the University of Ulster, and by the establishment of the Immersive Technologies Skillnet to address training needs in the immersive technologies area, including virtual production.

Digital Transformation in Ireland – Case Studies

The following section includes five case studies of recent digital transformation or implementation efforts within an Irish context. These case studies cover four key areas:

- ▶ Virtual and digital production
- ▶ Digital creativity and collaboration
- ▶ Digital and online learning
- ▶ Digital distribution and consumption

Each case study provides a clear focus both on emerging digital practices as well as the more immediate impact of COVID-19 pandemic and emphasises a number of key, relevant themes. In particular, the case studies examine:

- ▶ Pre-existing digital or online processes, and tools that have been developed further due to the pandemic
- ▶ More recent innovative digital and online practices, where they originated and how and why they have been adopted
- ▶ The impact of these digital or online processes and practices on teams and the sustainability of their use locally and on a wider scale

In doing so, the case studies further explore key drivers, outcomes and results of the changes, challenges encountered and lessons learned to inform future practice.

The organisations included in this research represent the wide diversity of the screen industries in Ireland. They are:

- ▶ High-Res
- ▶ Murphy Geospatial
- ▶ Cartoon Saloon
- ▶ Screenplay Unlimited
- ▶ The Irish Film Institute

Together, these organisations provide unique insights into how digital transformation is impacting the screen industries in Ireland. It is hoped that these insights will inform key future actions by government, stakeholders and funding bodies supporting the sector in Ireland.

Methodology

The five case studies included in this report were developed on the basis of a series of semi-structured interviews with leaders from each of the five organisations. Interviews were structured around key themes of relevance to the broader topic of digital transformation in the screen industries in Ireland, with sufficient scope to allow individual perspectives to emerge.

The interviews were augmented by specific research on key technical aspects in order to broaden out the discussion and provide greater context where appropriate.

The case studies were reviewed by each organisation prior to publication to confirm accuracy of representation.

4.1 Virtual and digital production

With the introduction of COVID-19 restrictions including both work from home rules, social distancing and travel bans, in-person production was severely curtailed. Through the application of cutting edge technologies and the further development of further digital capabilities, companies such as High Res and Murphy Geospatial were able to support new modes of digital production ensuring that wherever possible the show could go on.

Developing engaging realities: High Res



Formed in 1997, High Res is an Emmy® award winning, independent design practice specialising in Lighting Design, Pre visualisation, Virtual Production, LED, Projection & multi-disciplinary interactive systems. As a consultancy and creative studio, High Res integrates cutting-edge technology and design to deliver ambitious creative briefs for film, broadcast, and live events industries.

High Res has been involved in the design and creative direction for world recognised and award winning productions such as the **XXII Olympic Winter Games, Sochi, The Best FIFA Football Awards**, international touring theatre show **Riverdance the 25th Anniversary**, Netflix's **Nightflyers** series, Apple TV's **Foundation** series, RTÉ's **1916 Centenary Concert**, and live broadcasts such as **The Pope's Visit** and **Dancing with the Stars**.



The High Res approach to digital transformation

As a company specialising in various aspects of Virtual Production, High Res has adopted a range of digital approaches, including workflows and projects to achieve more efficient results. While digital transformation of production techniques including CGI, VFX etc has been growing in importance for many years, the pandemic forced High Res to undertake a bottom-up rethink of the way they work and deliver projects.

In particular, the enforced restrictions of the pandemic enabled High Res to approach projects, tasks and teams with a more remote and digital perspective, and in a way that would otherwise not have been possible. Importantly, while these elements can aid the production process, a huge amount of work still needs to be completed ahead of going into production. Streamlining this service to a more digitally enabled platform allowed High Res to continue preparing and delivering work regardless of the restrictions and still achieve the best results.

Specific areas of digital transformation include the following.

Pre-vis Suite

High Res run an extensive range of creative suite sessions in pre-production phases of a project. Depending on client and project requirement, this may include pre-visualisation (pre-vis), WYSIWYG (What You See Is What You Get) and other approaches. This form of digital visualisation ahead of time, allows the creative team to collaborate, input and communicate ideas in one place and with a mutual visual reference.

From a client perspective, pre-vis sessions provide significant security and comfort by enabling them to visualise the end result or final product. Ahead of being on-site for filming and production, pre-vis allows clients to look directly at what will and can be achieved, ensuring that the likely final outcome aligns with their creative vision and intention. This allows the team to make any necessary changes well in advance, consequently reducing programming, testing, set-up time and workload on the ground. In this regard, pre-vis can act as a type of insurance to back what the aim or intention of a project may be.

Importantly, while these sessions are run from High Res' Dublin pre-vis suite, creatives are able to join remotely from anywhere in the world. This not only enhances creative collaboration, but has also allowed High Res to access new global markets.

Virtual Production

A second key aspect of High Res' digital transformation has been a move toward Virtual Production.

"COVID rapidly accelerated the industry demand for Virtual Production because it quickly provided a solution for people and productions who couldn't travel but needed to shoot."

Eliza McLaughlin, High Res

For High Res, the implementation of Virtual Production solutions has been a way for films and productions to more effectively manage and run any filming taking place whilst subject to restrictions related to COVID-19. On a practical level, implementing a Virtual Production solution enables a production to work within a controlled and safe environment, reduce on-site crew numbers, eliminate or reduce the need for travel or location shooting. From a creative perspective, Virtual Production allows companies to much more effectively manage the production process, including the real-time manipulation of sets, backdrops, lighting etc.

A recent key project saw High Res integrate and implement a Virtual Production solution for Amazon Prime's Modern Love series, filmed at Ardmore studios. As a consequence of the prevailing COVID-19 restrictions, the production was limited in its abilities to shoot on location. Using large LED Volumes and pre-rendered plates, High Res were able to bring the location to the studio in a photo-realistic fashion. Scenes which were meant to depict a train journey were actually filmed on set in a studio in Wicklow, with the actual train journey pre-recorded separately and relayed on to the LED then as a background. This enabled filming to take place in a controlled and safe environment for both cast and crew, while also allowing the Director, Director Of Photography and talent the time and space to stop and start filming at their own convenience.

"This was a really creative and great use of a Virtual Production solution. Bound by restrictions, lockdowns and ever-changing guidelines for travel and work, we implemented and integrated a workable, safe and controlled solution using LED environments. Relieving the production of travel, set locations, weather considerations, time, budget, permits and so on."

Eliza McLaughlin, High Res

Overall, the process has enabled High Res to maintain and grow their workload and filming schedule and better utilise the time available. It further reduced the need for key team members or crew to travel to film sets or sites unnecessarily and has opened up a new, digital way of working that they had not previously been using before to this level.

Key technologies used

In undertaking this digital transformation, High Res drew upon a number of new and existing technologies.

A key technology utilised by High Res during pre-vis and some virtual production processes is Unreal Engine from Epic Games. First developed as a game engine, Unreal Engine is now increasingly used in the wider screen industries to develop near-real graphics and imagery, suitable for use on LED screens and backdrops.



Unreal Engine (UE in short) is a game engine developed by Epic Games, first showcased in the 1998 first-person shooter game Unreal. Initially developed for PC first-person shooters, it has since been used in a variety of genres of three-dimensional (3D) games and has seen adoption by other industries, most notably the film and television industry. Written in C++, Unreal Engine features a high degree of portability, supporting a wide range of desktop, mobile, console and virtual reality platforms.

<https://www.unrealengine.com>

Source: Wikipedia

As part of their use of technologies such as Unreal Engine, High Res have further developed unique approaches, pipelines and workflows for immersive production and in-camera effects. These advancements have enabled them to run and integrate large volumes and environments with LED, motion capture, real-time engines and camera tracking systems all working together.

“These emerging and developing technologies and software allow for artists and designers to create ‘worlds’ based on real or fictional places, which are then rendered back on the LED walls, creating an in-camera background, a point of reference for the actors and a source of dynamic and interactive light for the Director and DOP.”

Eliza McLaughlin, High Res

The use of this technology maximises flexibility for directors who are able to make adjustments to visuals and move between scenes and contexts with minimum delay, also accelerating the filming process.

Taken as a whole, these two steps were part of a radical digital transformation undertaken by High Res which has changed the way they approach things.

Key challenges

The challenges encountered by High Res when implementing digital solutions fell into a number of key categories.

An initial challenge for High Res was upskilling on the key systems, software and technologies to ensure that they could be applied fully and to ensure that they met their needs. While Unreal Engine is available free of charge and is open source it is a highly complex package requiring advanced technical skills, continuous advancement and up-skilling and sufficient hardware.

Linked to this first challenge are issues caused by a general skills gap across Europe in the required technologies. The technology skills required by companies

such as High Res are typically not taught at colleges and the games industry in Europe is small relative to the US. Consequently, skills in the areas of LED screen usage and management, systems integrators and scene development using tools such as Unreal Engine are limited and must often be learned rather than bought off the shelf.

A final challenge related to changes to ways of working. Filming using pre-vis and virtual production requires much higher levels of upfront work and preparation, along with strong attention to detail. This requires significant changes to the traditional approach to filming and fixing in post-production. While post production changes remain possible, the approach now is to “fix it in prep, not in post”.

Key learning points

High Res have learned a significant amount from this process and have radically transformed the way that they work. Key to this is recognising that remote dial in and digital workflows can be effective and efficient, resulting in reduced on-site time using pre-vis and collaboration with remote teams.

This does not mean that the more traditional approaches to filming and production will cease, but rather that technology has enabled and facilitated new ways of working and production which will ultimately enrich the production process. While virtual production adds a whole new facet to the production process it is not suitable for all contexts and is more accepted by audiences for specific types of production and certain creative briefs.

There is, nonetheless, no doubt that the digital transformation undertaken by High Res is a testament to technology’s essential role in the future of film. Longer term sustainability will require an ongoing development of both traditional and digital skills and the implementation of new technologies and techniques as they emerge.



Flavien Picon
Eco Games
EVENT STAFF
VR REAL

The invisible work of digital production: Murphy Geospatial



Established in 1983 as Murphy Surveys, Murphy Geospatial has grown from a small, family-run business to one of the largest geospatial companies in Ireland and the UK.

Murphy Geospatial provide critical surveys and geospatial data to allow their clients to work with confidence and maximise efficiencies across the project lifecycle, underpinning project decision making. To do this Murphy Geospatial captures, collates, verifies and governs geospatial data for their clients within the architecture, engineering and construction industries, allowing them to work with confidence and maximise efficiencies.

Murphy Geospatial specialise in providing both public and private sectors with high-end geospatial services across a range of sectors, including Construction, Industrial & Manufacturing, Infrastructure, Natural Environment, Property, Public Sector, and Smart Cities.

Services offered include:

- ▶ Aerial / UAV Surveys
- ▶ Building Information Modelling
- ▶ Digital Construction
- ▶ Digital Twin
- ▶ Hydrographic Surveys
- ▶ Inspection
- ▶ Laser Scanning
- ▶ Legal Mapping
- ▶ Property Consultancy
- ▶ Rail Surveys
- ▶ Subsurface Investigation
- ▶ Topographical Surveys
- ▶ Monitoring – Structural & Environmental

With offices in Kildare, Cork, Belfast, London, Manchester, Birmingham, Glasgow, Barcelona, Cologne and Milan, Murphy Geospatial has over 300 employees and operates on a global scale.

Since 2012, Murphy Geospatial has offered niche services to the screen sector in Ireland, an offering which has grown during the pandemic. This has primarily focused on reality capture for television and film productions, including both live action and animation.

What is geospatial?

Geospatial engineering leverages new high precision geospatial data capture technologies such as laser scanners (airborne and terrestrial), robotic total stations, GPS, unmanned aerial vehicles (UAVs) or drones and other mapping systems, and applications in both the natural and built environments. These include:

- ▶ mining, agriculture and infrastructure construction
- ▶ environmental monitoring
- ▶ urban and transport planning
- ▶ mobile and emergency services.

Diverse geospatial data are expertly combined to produce high precision 3D digital models, which can be used for many purposes, from enabling virtual construction to location-based service apps on a smartphone.

Source: <https://www.unsw.edu.au/engineering/our-schools/civil-and-environmental-engineering/about-us/civil-environmental-eng-surveying-careers/what-is-surveying-geospatial-engineering>

The offering pre-Pandemic

The Murphy Geospatial offering for the screen industries grew out of approaches from studies investigating scanning services in Ireland. The offering can be divided into three key areas. For each, the ultimate aim is to create a digital representation or copy of a set so that visual effects of various types can be created. Key areas as follows



Terrestrial Laser Scanning – Site Capture

- ▶ High-Definition Laser Scan Survey, using a terrestrial laser scanner, LIDAR or similar, referenced to detailed map coordinates.
- ▶ The point cloud information is post-processed using bundle-adjustment & least-squares algorithms, ensuring an optimum scan registration solution.
- ▶ HDS terrestrial Scanning can be captured with or without imagery.

HDS scanning allows for the rapid capture of extremely dense “clouds” of three dimensional points that accurately define solid surfaces. These point clouds become the framework for developing highly accurate CAD based models that can be utilized by all commonly available engineering design software.

<https://sgceng.com/survey-engineering-terrestrial-high-density-scanning/>

Aerial / UAV – Site Capture

- ▶ Site scanning and capture using drones (UAV), scanning for hard detail such as buildings and walls and soft detail such as vegetation and surface changes.
- ▶ Projects are undertaken by a two-person UAV team, one remote pilot and one observer for security and safety.
- ▶ The team use a state-of-the-art UAV with a high-resolution 36mp stills camera, the UAV itself is a redundant system thus increasing safety.

Close Range Scanning

- ▶ Murphy Geospatial partner with **3D Scanning Hub** (<http://3dscanninghub.ie/>) to offer a full range of close range scanning services.
- ▶ Close range scanning services allow for the detailed scanning of surfaces to allow subsequent physical or virtual emulation.

Key uses for Murphy Geospatial scanning services have included support for the development of VFX and 3D printing of props and other set elements. The technology enables the ability to zoom in or out to get much more detail which can be beneficial for both VFX and 3D printing of specific details. Importantly, this does not include x-ray scanning, but only focuses on thickness, colour and texture.

Geospatial in Film

How many films have you seen that showcase the wanton destruction of a major city? From disaster pictures to tales of space invaders, the modern Hollywood blockbuster will turn to specialists with a geodata skills set.

Utilising technology like Esri's 3D modelling software CityEngine, visual effects experts can recreate digital twins of real life cities inside their computers. Sometimes this can be built in as little as two or three days! Then it is a matter of combining the twins with a suit of additional visual effects. With supplemental support from model work and animation teams, the results can be scarily realistic.

It's not just CGI city destruction that geo information and digital mapping has helped Hollywood with. Sometimes it proves cheaper to build a city in a computer than to fly a film crew out to film it. Modern TV shows and films will often transport you to foreign countries, cities and landscapes without anyone from the crew having been there themselves.

Adapted from: <https://www.geospatislscience.com.au/geospatial-and-hollywood/>

While Murphy Geospatial have not encountered any push-back or barriers to their offering, a key challenge has related to the need to further develop and enhance relationships and understanding how this can be done. Historically they have nonetheless successfully supported a range of productions including Vikings, Into the Badlands, Penny Dreadful, The Turning and King Arthur.

The impact of the pandemic: growth and transformation

"Digital workflows are not new to Murphy Geospatial, however the rate of change and acceleration of technology over the last 10 years has allowed us to share digital datasets with a wider audience. The ability to digitally capture the physical world has proven very valuable to the screen industry. Digital records or datasets of locations are revolutionising the production of content"

Diarmuid Murphy, Director, Murphy Geospatial

For Murphy Geospatial and their work in the screen sector, the period of the pandemic has been less a full-scale transformation and more a period of growth driven by necessity.

While initially there was a pause in line with the overall slow-down in production brought about by COVID-19-related social distancing regulations, from 2021 onwards Murphy experienced a spike in demand and activity. The underlying approach from production companies would appear to be that "it is better to do it, even if it is not used".

Key productions supported during this time include **Disenchanted**, **Winx**, **The Silence of Mercy** and **The Banshees of Inisherin**.

Key learning points

The increased emphasis on digital technologies and production approaches has been hugely positive for Murphy Geospatial. In developing this side of their business, they have emerged as the leading provider of geospatial and scanning services to the screen industries in the Irish market.

In that regard, the Murphy Geospatial offering further enhances the scope and depth of services available to screen industry in Ireland and minimises the additional cost and complexity involved in bringing in crews from the UK and elsewhere. With the increased focus on CGI and VFX within the industry, this capability is a vital component of a long-term growth strategy.

Overall, this growth has changed not only what Murphy Geospatial deliver but also how it is delivered. In that sense, the further growth of geospatial services for the screen industries has enabled Murphy Geospatial both to broaden their offering and leverage greater value from their existing capabilities.

Other key learning points from the process are as follows:

- ▶ Flexibility is key when engaging with the screen industries in order to allow for changes to schedules and timings, as well as cancellations
- ▶ As with all sectors, the screen industries have their own language and terminology. Being willing to learn this and explain the nuances of scanning technology is key.
- ▶ As each job is inherently unique, pricing models need to be adaptable
- ▶ Limitations to current technology need to be fully understood and explained to clients to ensure expectations are met. Shiny and glossy surfaces can be challenging!
- ▶ Learning by doing is key: this helps not just to better understand the requirements of screen industry clients, but also approaches to produce data in better formats.

Looking longer term, it is inevitable that further offerings growing from this transformation will include the combination of photography and laser scanning, increased speed of delivery and minimise impact on filming schedules. Each of these will require specific skills and capabilities for delivery and success.



4.2 Digital creativity and collaboration

A specific and immediate impact of the pandemic was the need to find new methods and modes of collaboration. This was not just to ensure the ongoing survival of businesses but also to support the creative process through a challenging time. A leading example is Kilkenny-based animation studio Cartoon Saloon, who – through a focused programme of digital transformation – have revolutionised their approach to the creation of world-leading animation.

Implementing tools for creative collaboration: Cartoon Saloon



Cartoon Saloon is one of Ireland's and the world's leading animation studios. Specialising in maintaining the art of hand-drawn animation, Cartoon Saloon is renowned for the creation of unique and iconic movies and series.

Kilkenny based Cartoon Saloon is a five-time Academy Award®, Golden Globe®, BAFTA® and Emmy nominated animation studio founded by Paul Young, Tomm Moore and Nora Twomey. From award-winning shorts to feature films and TV series, Cartoon Saloon has carved a special place in the international Animation industry. The studio has a crew of over 200 artists and technicians in production and project development.

In 2010 the studio's first feature film, *The Secret of Kells*, was nominated for an Academy Award® and again in 2015 with Tomm Moore's follow up feature, *Song of the Sea*. *Song of the Sea* was also the first animated feature to win Best Picture at the Irish IFTA Academy awards.

Directed by Nora Twomey, Golden Globe® and Academy Award® nominated *The Breadwinner* was released in November 2017 to huge critical acclaim.

The studio had its first short film Academy Award® nomination in 2019 with *Late Afternoon* written and directed by Louise Bagnall and produced by Nuria Blanco. Most recently in 2020, *WolfWalkers*, directed by Tomm Moore and Ross Stewart was also Golden Globe®, Academy Award® and BAFTA® nominated and the studios second feature to win Best Picture at the 2021 Irish IFTA Academy Awards along with many other awards nominations and wins

Adapted from: <https://www.cartoonsaloon.ie/about-irish-animation-studio/>

The impact of the pandemic on Cartoon Saloon

As with most other organisations, prior to the pandemic Cartoon Saloon's crew operated almost exclusively from their studios in Kilkenny. Exceptions related primarily to specialist external collaborators such as sound engineers and others who were based globally. A key aspect of the Cartoon Saloon approach has always been the strong sense of community in Kilkenny and the high-level of in-person, face-to-face collaboration on projects. The approach and ethos to animation and film-making is summed up quite neatly by Cartoon Saloon:

"We like making films together. We like being in the room together and making them"

Assistant Director, Cartoon Saloon

With the imposition of pandemic-related restrictions in March 2020, Cartoon Saloon had many projects in production. Among other projects, the studio was coming towards the end of production of the Academy Award® nominated ***WolfWalkers***.

An Apple Original Film



Be fierce.
Be wild.
Be free.

FROM THE ACADEMY AWARD® NOMINATED MAKERS OF THE SECRET OF KELLS AND SONG OF THE SEA

WOLF WALKERS

AN APPLE ORIGINAL FILM A CARTOON SALOON & MÉLUSINE PRODUCTION IN ASSOCIATION WITH VALUER&POWER CULTURE COMMUNICATIONS FILM FUND LUXEMBOURG FÍS ÉIREANN/SCREEN IRELAND THE BROADCASTING AUTHORITY OF IRELAND HAUT ET COURT DISTRIBUTION
 CANAL+ RTE CGS AND PÖLE IMAGE MAGELIS/CHARENTE COUNTY FOIVARI AND GKIDS "WOLF WALKERS" FEATURING THE VOICES OF HONOR KNEATSEY EVA WHITTAKER SEAN BEAN SIMON MCBURNEY TOMMY TERNAN JON KENNY JOHN MORTON AND MARIA DOYLE KENNEDY
 WITH MUSIC BY BRUNO COULAIS IN COLLABORATION WITH KILA STORY BY AURORA MARIA DOYLE KENNEDY AND SOFIA COULAIS SCREENPLAY BY WILL COLLINS DIRECTOR OF PHOTOGRAPHY GERRY SHIRREN EDITOR FABIEN RENELLI EXECUTIVE PRODUCERS ZHANG SHUO YANG YING DIDIER BRUNNER DAMIEN BRUNNER ERIC BECKMAN AND DAVID JESTEADT
 PRODUCED BY PAUL YOUNG NORA TWOMEY TOMMY MOORE AND STEPHAN ROELANTS WRITTEN BY TOMMY MOORE AND ROSS STEWART

PG
 PARENTS STRONGLY CAUTIONED
 SOME MATERIAL MAY BE OFFENSIVE TO CHILDREN
 LANGUAGE

Apple tv+

Source: <https://www.cartoonsaloon.ie/feature-films/>

For **Wolfwalkers** – as with other projects in advanced production – the most pressing question was how to complete the final stages of production as effectively as possible with minimal impact on both quality of output and schedules. While some departments had completed their work, others such as compositing were only two-thirds of the way through. Although there was still significant work left to complete, people understood the key requirements and the film was sufficiently advanced to allow people to immediately work remotely.

The key challenge faced by Cartoon Saloon was, consequently, how to keep editing and collaborative work going remotely in order to complete existing projects and progress new projects.

Cartoon Saloon's digital transformation

In order to address the emerging challenges, Cartoon Saloon immediately explored technical solutions. The ideal solution envisaged should support their teams to work safely from home during pandemic restrictions while also maximising capabilities to undertake complex and demanding animation work. Three key platforms were utilised to facilitate this: **Teradici**, **Frame.io** and **ShotGrid**.

Teradici

Teradici facilitates secure access to central servers by remote workers. It was implemented by Cartoon Saloon in order to facilitate remote working and secure server access by crew when working from home.



Teradici Cloud Access Software enables remote access to Windows, macOS or Linux based computers including:

- ▶ Physical workstations or standalone computers (either deskside or centralized).
- ▶ Virtual workstations on VMware ESXi; KVM or Nutanix AHV Hypervisors.
- ▶ Non-graphics virtual desktops on VMware ESXi; RedHat KVM or Nutanix AHV Hypervisors.
- ▶ Remote workstations that reside on the public cloud.

Using Cloud Access Software, a small software agent is installed on any of the above 'host' computer variants. The host computer then uses the Teradici PCoIP protocol to communicate with a client device in a remote location over a LAN, WAN or public internet. The client device is connected to display, keyboard, mouse and peripheral devices such as Wacom devices, and is what end users interact with.

Source: <https://www.teradici.com/web-help/work-from-home/>

While Teradici was suitable as a solution for general office work and was arguably 90-95% effective for most tasks including streaming of live video, a number of issues were encountered. The size of files required to be accessed and transferred for compositing was challenging. This in part was due to local bandwidth issues which led to many crew having to upgrade their bandwidth capabilities. In some instances, crew were forced to operate over phone hotspots in order to maximise download and upload speeds.

Even more significantly, however, the system lags were such that issues were encountered in drawing and sound. While generally quite minor, they made many animation, production and editing tasks unworkable, and in general Teradici was found to be insufficiently responsive for remote editing.

These lag issues also meant that remote access to central servers using Teradici was unsuited for post-production. Consequently, each editor was required at times to download the files they were working on in order to edit remotely. This added further complication to the existing technical requirements.

A similar challenge was encountered with media sharing for collaboration. After two months of trial and error it was acknowledged that Teradici was not sufficiently responsive.

Frame.io

One solution to the challenges encountered with Teradici during the early days of the pandemic was the implementation of **Frame.io**. As an off-the-shelf product, Frame.io proved particularly effective during the final stages of **Wolfwalkers** and it overcame some of the key challenges encountered with Teradici. In particular, Frame.io was effective in supporting the large-scale challenges of production.

The platform allowed edits to be uploaded for directors and producers to watch and send back notes which stayed specifically linked to the timeline. These notes were consequently much more accurate than timestamp-related notes in Word or similar as once an edit is made all subsequent timestamps lose alignment. This was of particular importance for sound design and other tasks on **Wolfwalkers** and subsequent productions, including **My Father's Dragon**, a major new film commissioned by Netflix, which was almost wholly undertaken and completed remotely.



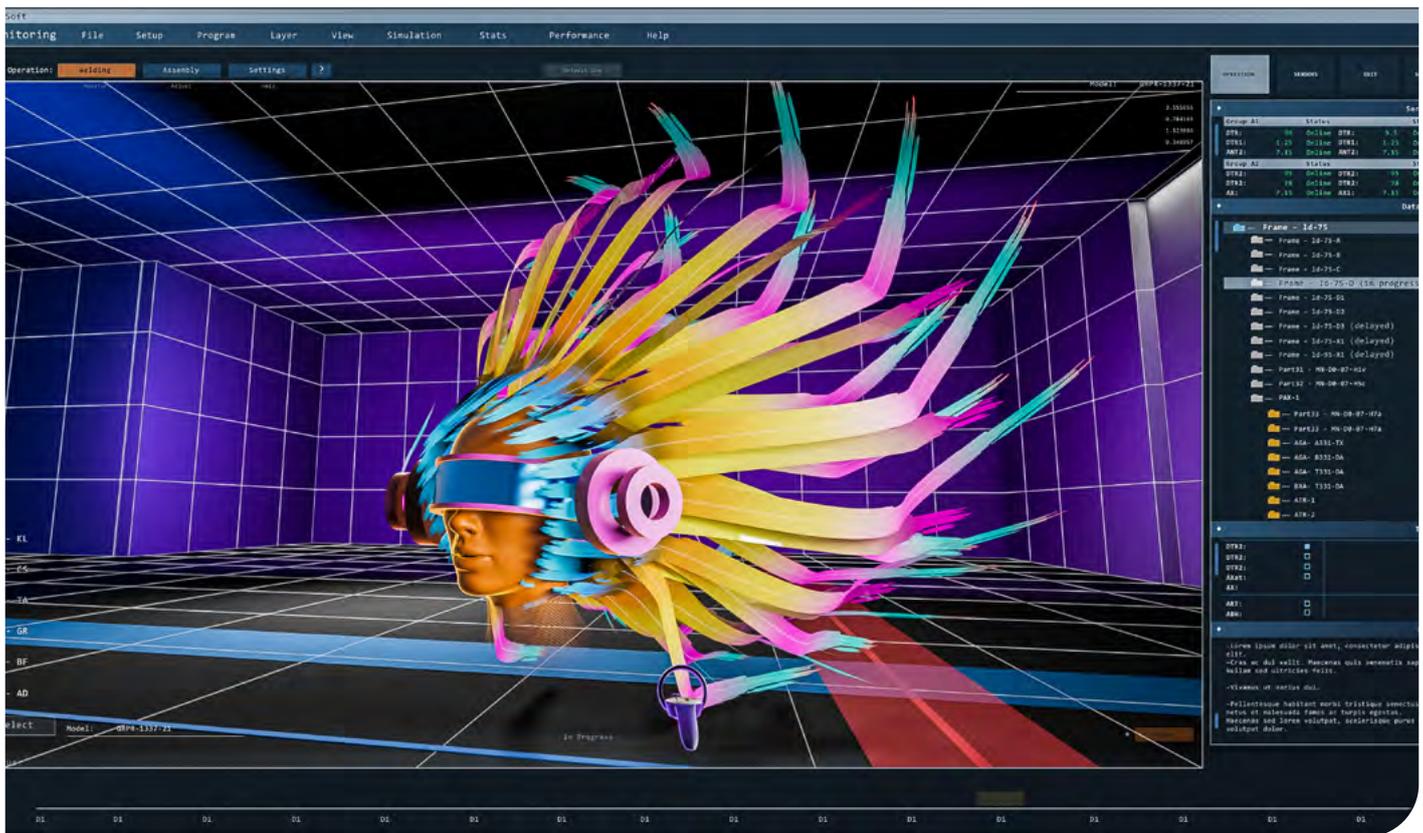
Frame.io is one of the world's leading video review and approval platforms with over 1 million users. Integrated with most major professional video tools, Frame.io streamlines the creative process by centralizing assets and feedback in the cloud. This allows remote creative teams to collaborate securely and in real time from anywhere in the world.

Conceived and designed in 2015 by video creators Emery Wells and John Traver, Frame.io is intuitive and simple, yet powerful enough for creative professionals, technical administrators, and clients to use with little (or no) training. Frame.io accelerates workflows and eliminates obstacles to creativity. From script or storyboard to dailies through delivery, Frame.io has reinvented the modern video workflow.

Source: <https://news.adobe.com/news/news-details/2021/Adobe-Completes-Acquisition-of-Frame.io/default.aspx>

Shotgrid

Previously known as **Shotgun**, **Shotgrid** is a web-based project management suite used primarily in the creative industries. Similar to other animation studios, Shotgun had been utilised by Cartoon Saloon for a number of years. Although an off-the-shelf product, over this time, Cartoon Saloon had already tailored Shotgrid to their own needs in order to maximise process efficiency and better meet their needs. Key coding scripts were already in place and could therefore be implemented immediately, allowing teams to work as if they were in the studio.



SHOTGRID

Shotgrid software is a secure and scalable production tracking, review, and asset management toolset for VFX, animation, and games studios. It connects teams and complex workflows, makes collaborative review easier, takes non-creative tasks off of the artist's to-do list and tracks every aspect of the production pipeline from start to finish. It helps people work faster and happier, teams iterate more, and studios keep the bottom line healthy. Shotgrid is used by more than 550 creative companies worldwide, which contribute to the ongoing development of its growing ecosystem of tools.

Source: <https://www.creativetools.dk/software/3d-software/shotgrid>

Shotgrid consequently proved highly effective as a collaboration solution when the shift to working from home began. When compared to Frame.io which as noted was useful for the high-level tasks, Shotgrid was more specifically effective in supporting Cartoon Saloon's 200+ animators deal with the more granular aspects of production.

Challenge's nonetheless emerged. Key amongst these was a challenge stemming from Shotgrid's deep integration into Cartoon Saloon's central servers. While this was suitable for compositing work, it was problematic if files were stored elsewhere, for example locally. Low tech solutions were therefore required at times to help address these challenges.

Impact and outcomes

The rapid implementation of technological solutions allowed Cartoon Saloon to continue to deliver high quality creative output, despite the limitations imposed by the pandemic and the need to work from home.

As a direct consequence of this, the studio was able not only to complete existing and ongoing projects including **Wolfwalkers**, but just as importantly commence, progress and even complete new projects. This includes **My Father's Dragon**, a major new film commissioned by Netflix, which was completed almost entirely remotely.

Moreover, from an organisational perspective this demonstrated that Cartoon Saloon have the ability to integrate new technologies and leverage the key capabilities which they can deliver. This required deep technical skills and a high level of collaboration to deliver.

As Cartoon Saloon themselves recognise:

“The fact that we were forced to have almost everybody work from home has let us know that it is possible to do, and certainly possible to do in a pinch”
Assistant Director, Cartoon Saloon

Needless to say there were both negative impacts and challenges stemming from this period and the associated digital transformation.

While Cartoon Saloon already had deep experience and expertise in the application of digital technologies to support the animation process, the imposition of work from home surfaced new challenges. Key amongst these was the need to maintain effective and constructive collaboration amongst crew working on the various projects. This applied for all crew members, but was particularly relevant for any new members who may have joined during the pandemic.

The Cartoon Saloon perspective on the importance of addressing these points is summed up by two relevant quotes:

“working from home allows flexibility, but the core is that we still want people to come together and work together”
Editor, Cartoon Saloon

“just because we can technically work away from each other – it's not as much fun, there's not as much job satisfaction, there's not the same sense of collaboration... it's just a lot harder”
Assistant Director, Cartoon Saloon

In particular, the imposed isolation brought about lockdown had tangible negative interpersonal impacts on:

- ▶ Interpersonal networks and links
- ▶ Identity and culture of the studio
- ▶ Learning from each other, as “**people learn so much from just walking about the room**”, Assistant Director, Cartoon Saloon
- ▶ Idea sharing within and between teams
- ▶ Creativity, including idea sharing and discussion
- ▶ Problem solving within the studio and within the teams

International studies by Microsoft Research (Yang et al., 2021) have demonstrated that Cartoon Saloon is not unique in experiencing these challenges as a consequence of enforced working from home restrictions.

In more practical terms, Cartoon Saloon experienced challenges associated with the secure and reliable sharing of media for collaboration. These were overcome through a variety of methods, though in a number of cases bandwidth proved a particular issue which needed to be addressed by individual crew members.

Similarly, despite having extensive technical experience, Cartoon Saloon encountered technology challenges. These were primarily associated with finding tools that suit the specific needs of animation and do not have unacceptable lags in sound or drawing.

Key learning points

“We actually want people to come here and work here and stay here, and work on the next project and work on the next project. If we possibly can keep people employed we want to”
Assistant Director, Cartoon Saloon

Although in many ways imposed by circumstance, Cartoon Saloon's accelerated digital transformation has yielded real benefits for the studio. It has enabled the studio and its crew to deliver award-winning content despite the evident challenges and difficulties. While the aim is to return to studio work, as already noted the transformation process has demonstrated what can be done and what technology can facilitate as and when needed.

Beyond this there are, however, a number of key and notable learnings. These include the following points:

- ▶ While technology can support the completion of technical processes it cannot replace the richness of face-to-face human interaction
- ▶ Key digital tools are helpful, but need to be assessed for each context and need, and for their appropriateness for use in animation
- ▶ Studios should be prepared to tailor and adapt tools and technologies as appropriate in order to better meet their needs
- ▶ Specific thought needs to be given to managing the ever-present challenge of data security and steps need to be taken to support this
- ▶ Bandwidth can be an issue for high-demand challenges and it cannot be assumed that all crew members will have access to high-speed broadband

On a human level, and despite the best efforts of Cartoon Saloon, dispersed working and the use of technological solutions can lead to the risk of greater siloes and hierarchies emerging. Equally, and if not managed carefully, there are significant potential risks for any organisation's culture and ways of working. This is a particular challenge for those working in highly collaborative and creative industries such as animation.

The digital transformation process has also demonstrated the potential for new ways of working. As noted by Cartoon Saloon: **"it might be that we actually keep this technology, but we layer it over people being in the room"**, Assistant Director, Cartoon Saloon. This might mean, for example, that mixed meetings are held where some people are face-to-face while others are online depending on their degree of involvement in a project and need for awareness and engagement.

If nothing else, Cartoon Saloon's digital transformation has demonstrated the huge potential and opportunity which technology can bring, and will continue to bring into the future.

4.3 Digital and online learning

While online and distance learning have existed for many years, the pandemic saw a surge in demand for and interest in alternative forms of learning. Screenplay Unlimited – led by Emmanuel Oberg – has been providing training programmes in screenwriting for many years. With the onset of the pandemic, however, a rapid shift to online learning was required.

Who is Screenplay Unlimited?



Screenplay Unlimited was founded in 2014 by Emmanuel Oberg, a screenwriter, author and creative consultant with more than twenty-five years' experience in the film and television industry. Oberg is the author of "Screenwriting Unchained" published in 2016, an international bestseller

on script development, and creator of the Story-Type Method®. A second book – "The Screenwriters' Troubleshooter" focusing on other aspects of screenwriting was published in 2019, with a third volume – "Writing a Successful TV Series" due for publication in 2022.



For several years, Oberg has also run a range of screenwriting workshops and training programmes, including the three-day Advanced Development Workshop and two-day modules on thriller, comedy, animation and TV Series writing. His clients include ACE Producers,

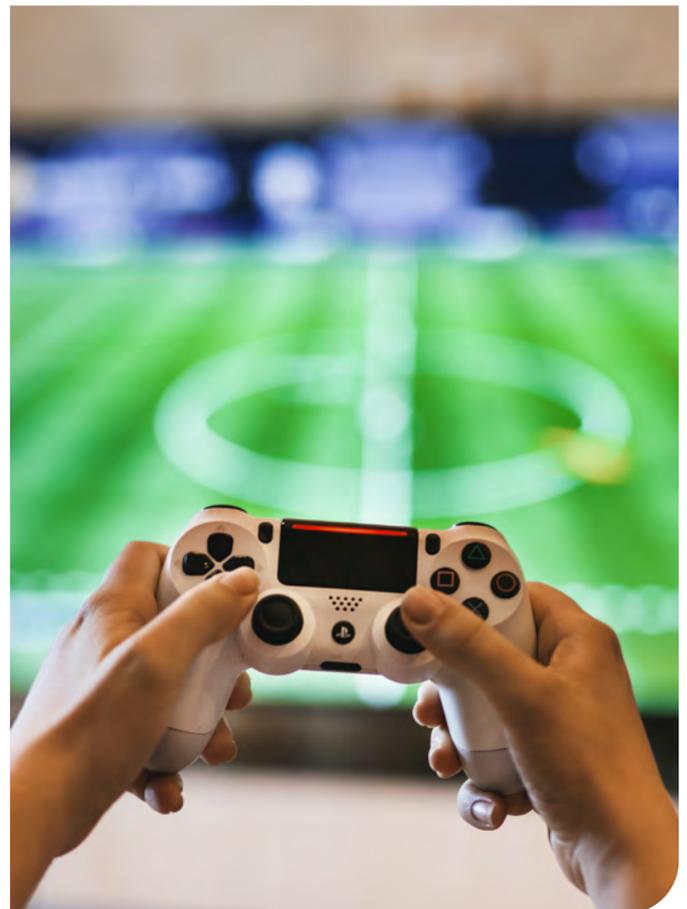
Screen Ireland, Screen Skillnet, the Netherlands Film Fund and Creative Europe as well as studios and independent producers.

The online offering pre-Pandemic

With a distant background as a software developer, Oberg had always considered the potential for online options and supports for training programmes offered by Screenplay Unlimited. This initially involved digitising all course materials and providing online member-only areas with materials for viewing and download. While this minimised the need for excessive printing, it also allowed regular updates as required.

Growing out of the three-day face-to-face Advanced Development programme offered by Screenplay Unlimited, a key focus then became how to convey the same information online in an accessible manner.

Consideration was also given to gamification in order to enhance engagement and motivation, however off the shelf platforms such as Thinkific or Teachable were not able to support this functionality to the desired degree.



The impact of the pandemic

As with other training organisations, the pandemic drove an immediate shift to online delivery. In the initial phases this was essentially a basic adaptation of existing face-to-face programmes for delivery via Zoom for interactive sessions and a webinar platform for lectures. There was no change to content, apart from the greater utilisation of polls, breakout rooms and the chat functionality. While this served an immediate and short-term purpose of meeting client needs and maintaining business momentum, it was not a suitable long-term solution. There was simply too much content for online delivery (a three-day face-to-face programme required four days for delivery due to additional breaks) and the impact of delivery via Zoom was much lower.

Prior to the pandemic there was simply not the time to develop the platform to required standard nor was there sufficient incentive for clients to shift to online learning. While some clients were interested, others preferred to maintain face-to-face programmes. As with every other aspect of life, however, the pandemic forced an immediate shift to online delivery and an acceptance that this was necessary. A decision was consequently made to develop a fully-functional online learning platform to support self-directed learning.

Key requirements for the platform included the following:

- ▶ It should not be a passive repository of information, but rather a platform that facilitated learning, engagement, discussion and interaction
- ▶ It should enable hands-on group work
- ▶ It should enable monitoring of progress
- ▶ It should enable learners to work at their own pace

Key ethical considerations when developing the platform included the following:

- ▶ A new offering should not undermine existing clients
- ▶ A new offering should not undersell existing courses
- ▶ A new offering should not “go around” clients to their customers/clients

To support existing clients, Screenplay Unlimited sought to develop a discount system which could be used to provide better offerings to their clients. This included developing an affiliate system for non-profit bodies to ensure that they were able to maintain value.

The outcome of the transformation

In response to the emerging business needs and the pressures of the pandemic, Screenplay Unlimited have shifted almost all of their learning online. To do this, they have designed and built a unique, bespoke learning platform based on the readily-available Wordpress platform.



WordPress (WP, WordPress.org) is a free and open-source content management system (CMS) written in PHP and paired with a MySQL or MariaDB database. Features include a plugin architecture and a template system, referred to within WordPress as Themes. WordPress was originally created as a blog-publishing system but has evolved to support other web content types including more traditional mailing lists and forums, media galleries, membership sites, learning management systems (LMS) and online stores. One of the most popular content management system solutions in use, WordPress is used by 42.8% of the top 10 million websites as of October 2021.

Source: Wikipedia.com

Key defining elements of this process include:

- ▶ All required functionality was delivered as required
- ▶ The solution is scalable and works well regardless of expansion levels
- ▶ Full platform ownership means that Screenplay Unlimited can update and modify as required, both in terms of content but also structure, design, branding etc
- ▶ Advanced functionality can be added as it evolves and as a requirement is demonstrated

While the platform development process was challenging, through a conscious series of prototyping, testing and iteration the final solution is a robust and effective solution which meets the needs both of Screenplay Unlimited and programme participants.

Programme Delivery

With the platform now live and fully functioning, Screenplay Unlimited have effectively transitioned from a traditional training company delivering face-to-face programmes, to an online learning company focused on a niche market and a strong IP offering.

Screenplay Unlimited outline the key elements of the learning process as follows:

How are the courses delivered?

Our online courses are self-led, with no live interactive element as standard. However, we use advanced tools to deliver a unique experience: training videos with subtitles and transcripts, hands-on topics for project work, interactive quizzes, gamification, extensive course materials and optional feedback on projects.

Although the transcripts are not downloadable, all the slides shown in a course are included in the course materials. Some courses have companion books, in

which case the book allows you to dive further into the subject. Free samplers of our books (first 60-70 pages) are also included in the course materials.

We can deliver live, interactive online sessions (Q&A, group work, project work, one-to-one meetings) for groups or teams of five or more participants, but these optional sessions can't be purchased directly from the website. Please look at our Live Workshops for more information or contact us.

*If you'd like to get some feedback on your project after completing a course, please check our Consulting and Coaching options. Participants of our online courses get **25% off a Script Chat**.*

Source: <https://www.screenplayunlimited.com/online-courses/>

The Advanced Development programme

The Advanced Development programme has been reworked from a 3-day face-to-face workshop to a self-directed programme consisting of 12 modules. Key components of the course are outlined below and demonstrate the significant degree of flexibility, gamification and interactivity built into the course structure.





What's Included in The Course?

- ▶ 90-day access to Screenwriting Unchained - Advanced Development (15 hours of self-led content in 12 training modules).
- ▶ Interactive quizzes at the end of each training module that help you check how much you've remembered and clarify your understanding. They also provide instant feedback depending on your answers, for example suggesting which topic you might want to revisit.
- ▶ Hands-On videos focusing on project development, raising questions and suggesting practical tips so that you can apply the content of each module to your work as you go along. The last hands-on, 'The Rewrite Stuff: 12 Ways to a Stronger Screenplay', looks at twelve key areas for your upcoming rewrite.

Source: Advanced Development Online Course | SCREENPLAY Unlimited

Gamification

Unlike the previous platforms utilised, the development of a bespoke platform allowed elements of gamification to be integrated into the learning process.

Gamification

The gamification of learning is an educational approach that seeks to motivate students by using video game design and game elements in learning environments. The goal is to maximize enjoyment and engagement by capturing the interest of learners and inspiring them to continue learning. Gamification, broadly defined, is the process of defining the elements which comprise games, make those games fun, and motivate players to continue playing, then using those same elements in a non-game context to influence behaviour. In other words, gamification is the introduction of game elements into a traditionally non-game situation.

There are two forms of gamification: structural, which means no changes to subject matter, and the altered content method that adds subject matter. Games applied in learning can be considered serious games, or games where the learning experience is centered around serious stories. A serious story needs to be both "impressive in quality" and "part of a thoughtful process" in order to achieve learning goals.

Source: Wikipedia

For Screenplay Unlimited, gamification involves participants completing quizzes and earning points as they progress through the course. These can be used as discounts for future courses participants may wish to undertake. Quizzes are used not just to test knowledge and progression, but also to motivate learning. Points are earned by learners from the successful completion of the quizzes. A specific game structure – **The Creative Freedom game** – is also fully integrated into the online learning. This involves learners not just testing their knowledge but also competing others on a leader board-style

Quizzes

Even if quizzes are not your thing, give them a chance! They are designed to entertain and motivate, but also to give you a way to check how much you actually remember from each module.

They also give you instant feedback, telling you why each answer was correct or not and suggesting which topic to revisit if you got it wrong.

Also, the better you do in the quizzes, the more points you accumulate, so the bigger the potential discount on your next course...

Creative Freedom Game

In the top right corner, you'll find a menu that gives you direct access to the Creative Freedom Game progress. You'll find more info on the game as well as a group-specific leader board on your group page.

Playing the game is optional, so you don't have to spend any time on it if that's not your thing. However, please note that points earned through the course can be redeemed against a future purchase (up to 25% OFF any course): The better you do in the quizzes and the further you go in the course, the bigger the potential savings on your next course...

Gamification on the Screenplay Unlimited platform consequently acts not just to provide a more engaging learning environment, but also to incentivise learners to progress through the course to completion and to gain more from their investment of time and money.

Accessibility

In designing the online platform and learning materials, conscious steps have been taken to maximise accessibility. On a basic level, this includes providing subtitles and transcripts for all videos, as well as speed controls and the ability to pause, re-wind etc. All PowerPoint slides utilised are available for download by learners and the platform includes an "accessibility tool" to support a range of needs and to support maximum participation.

You'll find in the bottom right corner an accessibility tool that offers a text-to-speech feature along with various modes: epilepsy safe, visually impaired, cognitive disability, ADHD friendly, blindness...

Don't hesitate to get in touch if you have any suggestions to help make this website even more accessible, as this is important to us

Impact and outcomes

The response from programme participants to the revised and updated process has been excellent – people are extremely happy with the new process, and the feedback and testimonials have been very positive.

For Screenplay Unlimited, the shift to online programmes has resulted in a stronger focus on refining, improving and diversifying the overall offering. This includes a greater emphasis on new content and workshops. As already noted, the online material can also be updated and refined much more readily should it become out-dated or should any errors be found.

This has also allowed a much more targeted focus on one-to-one interventions via Zoom for coaching or specific support. Equally, where face-to-face interventions are required through seminars etc they can be much more specifically designed to add value.

As much less time is spent travelling to deliver programmes, there is less time wasted and overall a much lower environmental impact in terms of air travel etc.

Challenges

Although the team at Screenplay Unlimited had wide-ranging technical and professional experience to draw upon, a number of challenges emerged. These are outlined below.

Commercial and practical challenges

Key amongst the commercial and practical challenges were the cost and time involved in developing and subsequently hosting the platform. This included a significant upfront investment in studio and computer equipment to ensure high quality production values, as well as in software in order to build and develop the online

platform itself through the coordination of significant in-house and third-party/freelance development. Some of these costs constitute a one-off upfront purchase of software licenses or freelance work expense, which has been privileged when possible, others are annual or monthly subscriptions, which constitute a significant ongoing expense for the company, besides hosting costs. All these investments and expenses had to be taken into account when defining a pricing structure for the online courses and the live workshops.

There was also a practical risk that the shift to online would not be well received by learners who might choose to wait until face-to-face programmes were once again available. Underpinning this perspective was a degree of fear of what is new and different. As with other learning opportunities, however, any doubts in this regard were rapidly overcome during 2020 as it became apparent that the pandemic would not be over in a matter of weeks. The obvious effectiveness of online learning solutions – including those provided by Screenplay Unlimited – also play a role in dispelling any concerns.

That said, as lockdowns have eased at various points over the last two years, some clients have requested a return to face-to-face programmes. While these have been delivered by Screenplay Unlimited in some circumstances the focus is now firmly on the provision of online programmes, either self-led or as the basis of live workshops.

Technical challenges

While Screenplay Unlimited already had an online platform hosting relevant learning resources it rapidly became apparent that this would not be sufficient for the revised demands. A key technical challenge related to the need for significant time to be allowed for the design and build of the platform. This involved managing and balancing both technical build-related challenges, while also ensuring that key instructional design elements were fully integrated, including gamification, learner progression etc. In practical terms this entailed the effective integration of learning structures and pathways for all programmes.

A shift to a fully online learning solution would also pose significant performance challenges given the much higher number of concurrent users. The existing infrastructure

was insufficiently robust to support this, as a cohort of forty participants going through the content at the same time could slow down the website significantly and cause occasional errors. So steps needed to be revised, primarily a change of web hosting provider and the use of cloud computing (virtual machines) instead of shared hosting for increased performance, security and scalability.

The extensive use of various caching layers and the implementation of a CDN (content delivery network, both for the website and for the training videos) also allows Screenplay Unlimited to deliver stable performance across the globe, which was important given the fact that a large proportion of the website users come from outside of the UK & Ireland (mostly continental Europe, North America, India and Australia). There was no single geographical location that could serve the majority of users optimally, so these steps had to be taken to serve a worldwide audience efficiently. The shift of focus to developing a robust online learning platform also impeded other technical work, including the scheduled refresh and upgrade of the main Screenplay Unlimited website. This was already due an upgrade, but was slowed down to focus on the development of the new platform.

Although it keeps evolving, the new platform and the change of web hosting provider was completed in the Summer of 2021, so the bulk of the digital transformation took a bit more than a year overall, from Spring 2020 to Summer 2021.

Key learning points

The digital transformation undertaken by Screenplay Unlimited has been hugely positive. It has changed not just how programmes are delivered but also what is delivered. In so doing, it has enabled Screenplay Unlimited to broaden their offering and integrate a wider range of tools and functionalities.

While face-to-face support and programmes will always have a place, these can be made more tailored and specific. Moving the core and repeated content online has allowed Screenplay Unlimited to deliver that content in a more efficient way with subtitles, transcripts, gamification and self-pacing, while focusing live interactions where it

is most needed. This can come about either because the participants are different (for example Q&As, hands-on group work) or the projects are different (project group work, one-to-one meetings, etc).

Not only, therefore, has digital transformation proven to be highly positive and desirable for Screenplay Unlimited but having embraced transformation, there is now no return to the older way of doing things.

Other key learning points from the transformation undertaken by Screenplay Unlimited are as follows.

- ▶ Given its nature, the Screenplay Unlimited content is better online
- ▶ Learners are better able to engage online and through the functionality built into the online platform
- ▶ Online learning empowers learners to engage at their own pace and in their own time
- ▶ From a trainer's perspective, delivering the same training programme over many years is draining and ultimately has an impact on the quality of delivery
- ▶ Trainer time can be better spent on targeted support where it is desired by learners and where it is needed
- ▶ Online delivery has real and tangible environmental benefits

Over recent months Screenplay Unlimited's digital transformation has further developed – both consolidating and expanding their online offering. This includes a television series add-on – Screenplay Unlimited's second self-led online course. This is supported by a range of hands-on face-to-face workshops designed for previous programme participants to support more tailored content development.

The overall impact of the digital transformation is summarised by Emmanuel Oberg, founder and director of Screenplay Unlimited, as follows:



"Moving some of our training online over the last couple of years was a game-changer. It has allowed us to reach a wider audience worldwide while reducing our carbon footprint. This way of working also helps us to allocate our resources more strategically. Through our self-led online courses, we deliver the content that is the same for all participants, which means that we can free up more time to design live workshops fully focused on what's different each time: the participants themselves and their projects.

None of this would have been possible had we not embraced this digital transition as the online courses allow us to scale our business in a way that simply wasn't conceivable before. Overall, it took a few years from inception to implementation and we faced a steep learning curve, but it was definitely worth it. We're happier and the vast majority of our clients and participants are happier too: it's a clear win-win!"
Emmanuel Oberg, founder and director, Screenplay Unlimited

4.4 Digital and online distribution and consumption

While maintaining the production capabilities of the screen industries was vital during the pandemic, so too was ensuring that audiences were able to view and consume media when unable to access cinemas and other settings. The development in recent years of streaming services and VOD has demonstrated that a market for at-home viewing of a range of media exists. The question, however, was how unique and targeted in-cinema and in-person offerings could be adapted to meet the needs of modern audiences. These challenges were grappled with in an innovative and ultimately highly effective manner by the Irish Film Institute as they sought to maintain relevance and audience engagement despite cinemas being closed.

Moving the in-person online – The Irish Film Institute



Irish Film Institute

Initially founded in 1943 as the National Film Institute with an educational remit, the Irish Film Institute (IFI) is Ireland's national cultural institution for film. The IFI's activities fall within three key streams of activity: Preserve, Exhibit, Educate. Each are understood and outlined as follows by the IFI:

PRESERVE

The IFI Irish Film Archive acquires, preserves and makes available Ireland's moving image heritage, working to ensure that Ireland's rich and varied film history, both amateur and professional, is protected and accessible for the benefit of current and future generations

EXHIBIT

The IFI delivers a challenging and diverse programme of the best of international and Irish film culture through a programme of new releases, curated seasons, festivals and events. The IFI is committed to providing its audience with access to the best of new Irish film, including a number of films that would not otherwise have a theatrical release, and many films that would not otherwise be seen in Ireland.

EDUCATE

IFI Education actively introduces new audiences to film culture and provides young people throughout Ireland with access to challenging and inspiring cinema. This is achieved through an extensive schools programme, both at the IFI and touring nationally, and through a number of innovative programmes aimed at family, youth and life-long learning audiences.

Source: IFI.ie

In addition to its cinemas on Eustace Street in Temple Bar, the IFI offers a wide range of online and outreach services.



In terms of digital, the IFI seeks to achieve its remit through four programmes:

- ▶ **IFI Archive Player** – “The IFI Archive Player is a virtual viewing room for the remarkable moving image collections held in the IFI Irish Film Archive, giving audiences across the globe instant access to this rich heritage. With over 900 films available on the IFI Archive Player, the material has been curated to give audiences a taste of the breadth and depth of the collections preserved by the archive. Home movies, newsreels, travelogues, animations, feature films, public information films and documentaries have been included as we have tried to reflect all aspects of indigenous amateur and professional production.”
- ▶ **IFI International** – “IFI International is the Irish Film Institute’s global streaming service, making Irish film available for cultural exhibition worldwide, supported by Culture Ireland. We are delighted to expand our already far-reaching activities with this new programme, where we will work with our international partners and festivals to present a wide-ranging programme of Irish film online.”
- ▶ **IFI Schools** – “IFI Schools Programme comprises film screenings, events, workshops and teacher CPD, supporting film as a subject, film as an artform for study or as a medium for exploring film and media literacy. Further support for teachers can be found on the IFI Archive Player. We have developed a Short Course in Film for Junior Cycle, which can be found here. Outside of school we deliver the Young Audience Award (YAA) Jury programme of the European Film Academy and our IFI Explorers for young people 15-18.”

(source: IFI.ie)

The Irish Film Institute’s digital transformation

With the advent of the COVID-19 Pandemic in 2020, the IFI – like other cultural institutions – was faced with a conundrum: how to achieve its remit and remain relevant while also fully complying with the prevailing COVID-19 restrictions. In March, 2020, this resulted in the closure of the IFI, including cinemas, shop, café and library.



Source: <https://ifi.ie/2020/03/irish-film-institute-temporary-closure/>

For the IFI, the immediate challenge was how to maintain a programme of screenings, seasons and festivals when cinemas were closed? The response was the creation of IFI@Home.



The IFI@Home story

Even before the pandemic, the creation of IFI@Home had been under discussion for some time. Despite this background work, screening through the three physical cinemas in Temple Bar remained the priority. Yet faced with closure for an indeterminate period, the launch of IFI@Home gained even greater significance and was launched in July, 2020.

“IFI@Home is the Irish Film Institute’s online streaming library providing audiences throughout Ireland with access to the finest independent, Irish and international cinema. The platform reflects IFI programming with new releases, cinematic classics as well as themed seasons, festivals and collections.”

From its inception, IFI@Home was designed to achieve three key aims:

- ▶ Provide a video-on-demand platform geo-blocked to the Republic of Ireland
- ▶ Offering new theatrical releases, IFI festival programmes and seasons, and a library of Irish titles
- ▶ Expand IFI’s national reach

In this regard, the links to IFI’s overall strategy were clear, a point emphasized by IFI Director/CEO, Ross Keane, when announcing its launch:

The launch of IFI@Home delivers on a key aspect of our current five-year strategy, to extend the reach of the IFI’s programming beyond our landmark Temple Bar venue to homes across Ireland. This is particularly relevant in these strange times when everyone is engaging with the arts online in far larger numbers than they ever did before COVID-19, and the IFI is delighted to respond to this change. We are particularly proud to launch IFI@Home with the Reel Art Collection, an inspiring, thought-provoking and diverse miscellany of Arts Council-funded documentaries, produced by some of Ireland’s finest filmmaking talent. During this difficult time, the IFI remains committed to supporting filmmakers both at home and abroad, and we look forward to making their work available to as wide an audience as possible through this new platform.

Ross Keane, Director/CEO – IFI

The creation of IFI@Home

“It was kind of like landing in an alien country and no-one knows the language”

Frances Wilde, Acting Head of Marketing

Although the IFI was able to take inspiration in a wide-range of existing online services such as Curzon Home Cinemas, Filmhouse, MUBI and Dogwof and various UK festivals, the creation of IFI@Home required the effective resolution of a range of challenges –commercial, practical and technical. A number of these are outlined below.

Commercial and practical challenges

Key amongst the commercial and practical challenges were the following:

- ▶ Any new platform created by the IFI needed to avoid being “just another VOD platform” (Frances Wilde, Acting Head of Marketing)
- ▶ IFI@Home needed to be distinctive in terms of its look and feel as a platform, but primarily in terms of its offering. The offering needed not only to be sufficiently unique, but also sufficiently reflective of the IFI’s overarching mission, purpose and strategy.
- ▶ While IFI had experience negotiating terms with distributors for screenings in their cinemas, these terms needed to be re-negotiated to allow for online streaming through IFI@Home
- ▶ Pricing of the new offering needed to be competitive against existing VOD players and accessible for IFI audiences. This required a degree of monitoring of competitor activities and price points to ensure that prices were suitable.
- ▶ The shift to digital required the creation of new positions within the organisation to support this, along with either the upskilling of existing staff to fill those roles or the hiring of new staff

- ▶ The dynamics of online audiences and attendance were unknown. Not only was it vital to attract audiences to the new platform, but retention was also key
- ▶ The creation of a new brand was required for IFI@Home, including effective colours, links, imagery etc
- ▶ A revised marketing strategy was required which engaged with new, online audiences in order to attract and retain. This required the promotion of multiple platforms and events and required a significant amount of time. Key elements included copious messaging on various platforms to raise awareness and a significant amount of A/B testing to ensure maximum effectiveness
- ▶ Wherever possible, existing seasons and festivals were to be delivered as a key focus



SHIFT72 provides a range of single vendor Video Media Platform solutions for hosting, managing, delivering and monetizing video across multiple platforms and apps. Our solutions allow customers to continue focusing on creating and delivering quality video content to viewers without having to worry about complex video streaming technology. Unlike multi-vendor solutions that bring together video technology from multiple sources to form a single solution, our entire cloud video infrastructure is developed and managed in house by a dedicated team of video engineers.

Source: <https://www.shift72.com/blog/what-we-mean-by-a-single-vendor-solution>

Technical challenges

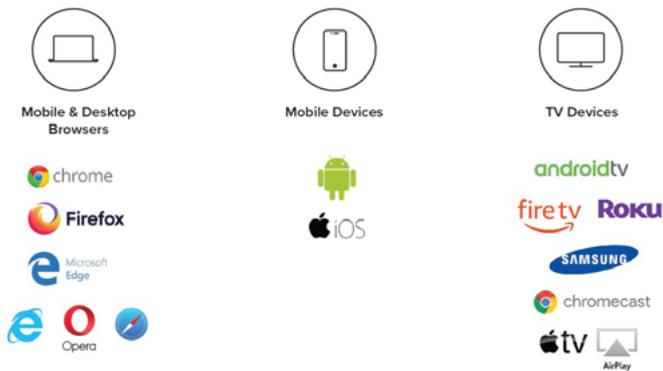
The chosen vendor for the IFI@Home platform was Shift72, a New Zealand-based provider of video media platform solutions. Shift72 provides the background technology for a range of VOD platforms and services, including: CPH:Dox, Marché du Film, Cannes, Melbourne International Film Festival and others.



Beyond their existing market reach and reputation, key deciding factors for IFI when selecting a VOD vendor were:

- ▶ Accessibility
- ▶ Affordability
- ▶ Flexibility

Accessibility in this regard refers to the option of providing close-captioning, though importantly the Shift72 platform is largely platform neutral. Access can be supported through a wide range of browsers and TV devices, as well as mobile devices such as apps.



Source: <https://www.shift72.com/guides-and-ebooks/apps-platforms>

Prior to launch, the off-the-shelf platform provided by Shift72 needed to be adapted and tailored to meet the specific needs of IFI. The process has been likened to buying a generic Wordpress site which requires a process of tailoring and branding the appearance in order to meet the IFI’s specification and required functionalities.

Beyond branding, appearance and functionality, a number of technical requirements were key. These included:

- ▶ Geo-blocking to ensure that access to any films screened could be limited to the Republic of Ireland.
- ▶ Digital Rights Management (DRM) to ensure that copyright integrity is maintained.
- ▶ The monitoring of uploads and activity data.

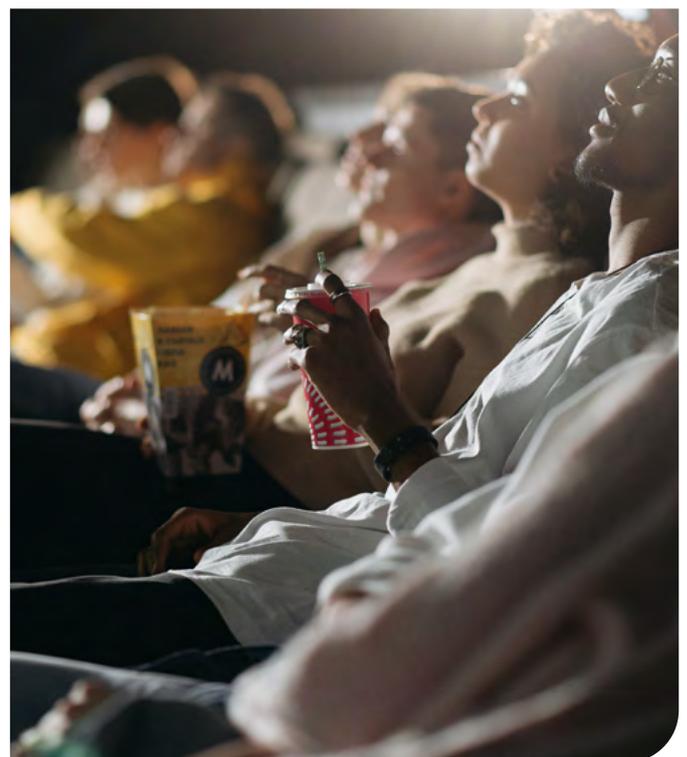
While challenging to overcome, these challenges could be managed through the functionality of the Shift72 platform, though with a degree of tailoring to the IFI’s needs.

Importantly, the Shift72 platform enabled the creation of specific apps for Apple and Android, available through the various app stores. The platform also enabled additional functionality such as gift cards.

A key technical challenge which emerged only after implementation was the livestream of Q&As as part of seasons and festivals. While challenging, this was overcome, and Q&As for IFI festivals were successfully delivered.

Return to cinema

In due course, further challenges emerged when cinemas were able to re-open, even if only temporarily. In essence, what was found was that once the technological platform was in place, either all in-cinema or all online was easier than a hybrid model. Moving to a hybrid of online and in-cinema caused the IFI to once again rethink how they do things, delivering on their remit while maintaining customer numbers.



Results and outcomes

The creation of IFI@Home allowed the IFI to continue to deliver high quality programming throughout the COVID-19 Pandemic. In this way, the team were able to deliver on their strategic vision and their remit to preserve, exhibit and educate. In doing so they recognised that:

- ▶ IFI audiences are quite loyal
- ▶ While there are numerous VOD offerings, there was and is no direct competition for IFI@Home given the scope of the offering
- ▶ In order to attract and retain audiences a number of important points became evident:
 - Exclusive offerings are key
 - Documentaries drive business
 - There is a need to closely align screening to cinematic releases
- ▶ Digital marketing is key, most particularly “hot lists” and the tone and content of the messaging
- ▶ Multifilm bundles are attractive for audiences, especially for seasons such as Horrorthon

Audience reach

The introduction of IFI@Home allowed the IFI to expand and diversify its audience. While typically 85% of the IFI’s in-cinema audience is from Dublin, with IFI@Home this fell to 61% as audiences around the country were more able to engage. Targeted seasons and festivals allowed the IFI to access both younger and more diverse audiences beyond the standard age and gender demographics (typically 45+ years and 60% female). Equally, 3% of audiences were existing IFI members and 50% were repeat viewers.

Seasons and festivals

The introduction of IFI@Home enabled the IFI largely to maintain its existing schedule of festivals and seasons. Over 2020 and 2021, IFI@Home delivered the following:

9 Seasons	12 Festivals
▶ The Reel Art Collection	▶ East Asia Film Festival Ireland 2020
▶ The Good Sports Collection	▶ IFI Documentary Festival 2020
▶ Growing Pains Collection	▶ GAZE 2020
▶ Japanese Story	▶ IFI Horrorthon 2020
▶ Classics Seasons	▶ IFI French Film Festival 2020
▶ Wild Strawberries	▶ First Fortnight 2021
▶ EAFFI Discoveries	▶ East Asia Film Festival Ireland 2021
▶ Architecture on Film	▶ Dublin Feminist Film Festival 2021
▶ Roy Andersson Season	▶ IFI Documentary Festival 2021
	▶ GAZE 2021
	▶ IFI Horrorthon 2021
	▶ IFI French Film Festival 2021

The platform also allowed specific, more targeted festivals and seasons to be introduced:

- ▶ **Wild strawberries** – the bi-monthly film club for the over 55s
- ▶ **Bleeding Hearts Valentine’s Day Horrorthon** which attracted a very different demographic to normal: 90% males aged 35-44 years

Indirect outcomes

The introduction of IFI@Home also led to a number of indirect outcomes. In particular the development of two additional on-demand platforms:

- ▶ IFI@Schools, extending the IFI's education remit to schools nationally
- ▶ IFI International, offering IFI's programme of Irish films to international festivals around the world (Boston, San Francisco, Rome, Belgium, Oulu, Ottawa) and a library of Irish films available anywhere in the world

IFI@Home also enabled the re-brand and re-design of the IFI Player to the IFI Archive Player.

While the ambition was to create the most accessible programmes, with re-opening of cinemas as the pandemic seemingly comes to an end, the IFI now intends to continue hybrid screenings through their various platforms. This hybrid approach will underpin the ongoing relevance and sustainability of the IFI approach, most particularly as they continue to compete with both international stream platforms such as Netflix, Apple and Amazon, and indigenous rivals such as Volta.

Key data

The success of IFI@Home is validated by a range of data points:

- ▶ www.ifi.ie: has an average of 57,000 weekly unique page views
- ▶ Web users were up 214% from 2020 to 2021
- ▶ There was a 636% increase in web traffic from social media
- ▶ Instagram sessions were up 2,390%, Instagram Stories up 3,171%
- ▶ The IFI has 142,900 followers across social media
- ▶ The IFI now has four digital platforms: IFI@Home, IFI Archive Player, IFI International, IFI@Schools

This success was felt in other areas of digital including IFI Archive Player which saw a significant increase in audience during lockdown. During the first eleven weeks of lockdown (from March 2020) the site saw:

- ▶ 246% increase in users
- ▶ 193% increase in plays
- ▶ 218% increase in App downloads

This demand continued in 2020 with an overall YoY increase of 95% in users and 78% increase in App downloads.

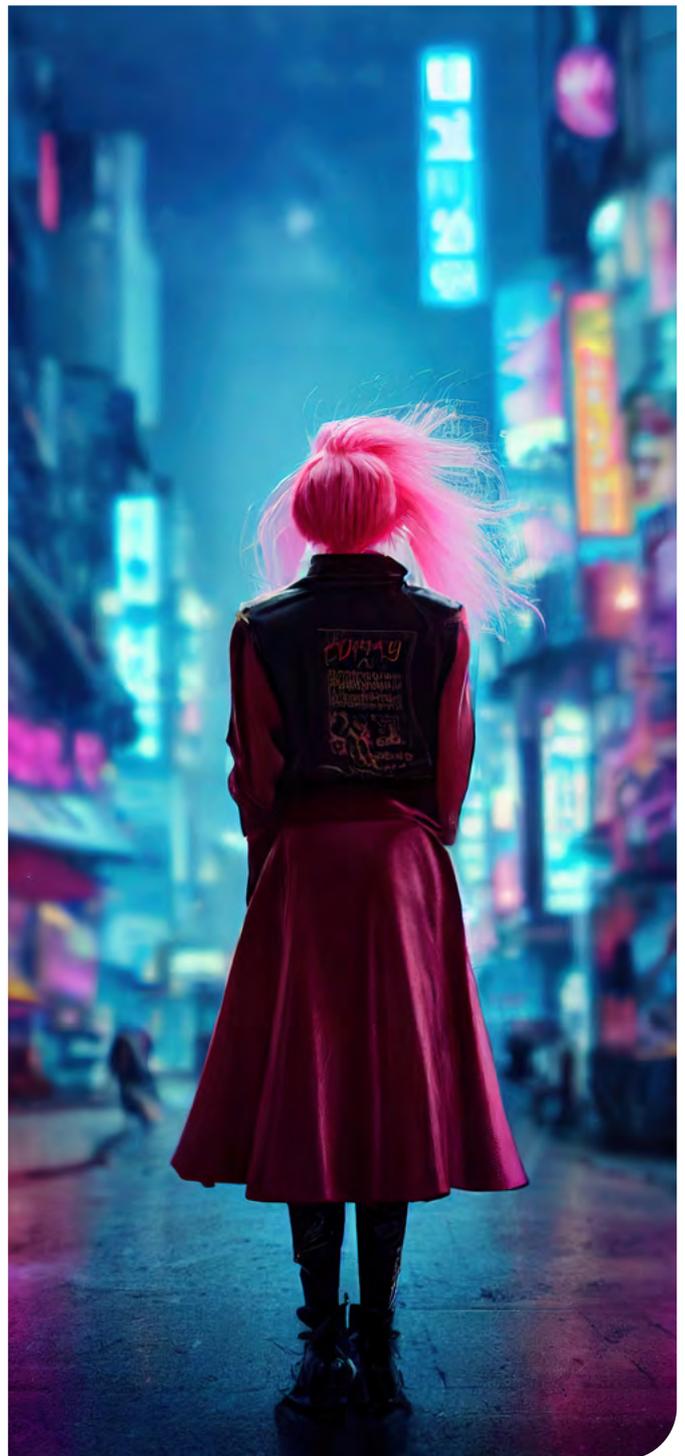
Key learning points

“The future of online lies in accessibility, nationwide reach, strong programming, and ongoing collaboration with distributors on online release models”

Frances Wilde, Acting Head of Marketing

Considering the points made above, the key learning points from the IFI@Home process were as follows.

- ▶ When undertaking a project of this nature it is essential to think big and be ambitious
- ▶ There is a demand for the IFI's programme and offering nationally, not just in Dublin
- ▶ There is a demand for a hybrid offering of both online and in-cinema, however licensing protocols can make hybrid challenging
- ▶ Pricing models for online are different than in cinema – cheaper pricing is required for online
- ▶ Quality control of films is a much greater requirement for online rather than in-cinema
- ▶ Tracking uploads and activity data is absolutely vital from the start
- ▶ To attract and retain audiences, clarity is needed the difference between online, in-cinema and hybrid offerings
- ▶ While off-the-shelf platforms are a good starting place they require significant tailoring to meet specific needs







5

Conclusions

“Digital transformation is not a single thing, but a multi-faceted journey with differing goals depending on your industry and digital maturity”

(Furr et al., 2022)

This report has provided five case studies of recent digital transformation and implementation efforts in the screen industries in Ireland. In Ireland as elsewhere, ongoing digital transformation is key for the longer-term success of the screen industries, and the COVID-19 pandemic and associated restrictions and constraints have significantly accelerated the adoption of new techniques and approaches within the screen industries globally. In this regard, the pandemic only built upon existing underlying trends, the impacts of which will continue to be felt for many years to come.

A number of consistent themes have emerged from the case studies explored in this report. These include the following:

- ▶ The need to respond promptly and proactively to key contextual changes as they emerge, including COVID-19
- ▶ The benefits of implementing new technologies ahead of competitors
- ▶ The importance of adapting in the face of evolving competition, market needs and customer demands
- ▶ The importance of learning from implementation challenges and constantly seeking to refine processes and the overall offering

More broadly, the experience of all five organisations highlights that the competitive landscape for the Irish screen industries is truly international. Effective digital transformation will ensure that Irish organisations can continue to compete, however this requires adapting to both local and international standards. This is particularly so for any organisation seeking to move into international markets or equally wishing to compete with international players in the Irish market.

This also highlights the importance of ambition to the success of digital transformation. As each of the case studies demonstrate, ambition is vital for success as a digital initiative requires a radical re-imagining of the organisation, its processes and its market offerings.

More specific and detailed conclusions are outlined below.

Organisational dynamics

The challenges faced by **Cartoon Saloon** in moving to a primarily remote way of working exemplify the impact of digital transformation on organisational dynamics. By successfully grappling with these challenges, Cartoon Saloon were able to complete work in progress and develop new projects, while all the time maintaining staff engagement.

Key impacts on organisational dynamics:

- ▶ The implementation of digital solutions has had significant impacts on an organisation’s broader activities and functioning. These cannot be underestimated and bring both opportunity and risk
- ▶ The increased adoption of remote, hybrid and flexible working practices will impact on organisational culture and require new forms of leadership and leadership practice. Basic team processes of trust, empowerment, effective communication and psychological safety are all key to support the embedding of emerging digital practices
- ▶ While the implementation of new technologies can support the effective and efficient completion of technical processes it cannot replace the richness of face-to-face human interaction and the creative benefits stemming from this



- ▶ Digital offerings require different pricing models to meet market needs. This applies to both B2C and B2B products and services
- ▶ A clear distinction must be made between various forms of offering– online, in-person/in-cinema, blended – to facilitate choice and engagement
- ▶ A strategic approach to digital innovation is vital for longer term success. This involves building upon existing capabilities, responding and adapting to changing market needs and developing flexible solutions.

Business model impacts

Screenplay Unlimited, High Res and **the IFI** each developed new offerings during the pandemic, building upon new-to-the-business technologies which enabled them to maintain existing markets and enter new markets. For Screenplay Unlimited and the IFI this required a new business model to be developed, with separate pricing and customer engagement strategies. In contrast, while the High Res offering was developed, it built more upon existing capabilities to deliver flexible solutions to meet market needs. Similarly, **Murphy Geospatial** further enhanced their position by consolidating an existing product offering to grow their market share.

Key business model impacts:

- ▶ The implementation of new technologies will not compensate for a poor business model: basic elements of strategy, business planning and market awareness are still required for commercial success
- ▶ Effective digital transformation can bring significant practical and competitive benefits, however these do not automatically accrue and cannot be assumed. Significant upfront and ongoing work is required to gain these benefits and may lead to new business models

The impact on skills and capabilities

In developing new, digital solutions, **High Res, Murphy Geospatial and the IFI** each developed skills and capabilities which had previously not existed within their organisations. This required an investment of both time and money, however it was an essential step to ensure continuity of service and delivery during the pandemic.

Key impacts on skills and capabilities:

- ▶ The successful integration of digital technologies can require new skills and capabilities. While those involved in creative work need to adapt to new ways of working, deep technical skills are also required to integrate and adapt technologies to meet organisational contexts needs
- ▶ Successful longer-term digital transformation requires constant learning and adaptation. Organisations which undertake digital transformation must constantly seek to implement, learn, iterate and refine their digital processes and associated offerings
- ▶ Appropriately targeted and tailored learning & development interventions can be effectively delivered using digital technologies, particularly for a dispersed and diverse audience

- ▶ Significant investment is required to support the upskilling and reskilling of existing crew and teams to support the implementation of new technologies, particularly so given the technical skills deficit across Europe. This will be required both by organisations operating within the sector, as well as by those organisations providing skills development for the sector including colleges, universities and other training bodies.

Technology impacts

Given the nature of digital transformation, technology impacts were felt to a greater or lesser extent by all organisations. **Cartoon Saloon** made significant changes to their operating model to move from in-studio to at-home creative work as a result of the pandemic, which also required adaptation of existing “off-the-shelf” technology products. In so doing they encountered challenges with local accessibility and grappled with the implementation of new data security processes. Similarly, **the IFI** developed new streaming services by building upon existing technologies and adapting them to their needs. In contrast, **Screenplay Unlimited** drew upon deep technical skills in-house to develop new platforms for the delivery of learning

Key technology impacts:

- ▶ While there has been a proliferation of off-the-shelf digital products and solutions, significant tailoring and adaptation is required before these are suitable to meet specific needs and requirements
- ▶ Although the implementation of new technologies can support enhancement of current offerings and the development of new offerings, though low tech solutions can also be good if they meet market needs
- ▶ Local constraints on technology should always be considered: broadband access can, for example, prohibit the successful utilisation of digital solutions in remote and regional areas
- ▶ Specific steps need to be taken to manage data security when teams are dispersed and working remotely, in addition routine data security requirements which may already be in place



Diversity and inclusion impacts

By developing new, digitally-enabled solutions for distribution, learning and work, **the IFI, Screenplay Unlimited** and **Cartoon Saloon** each took significant steps to enable greater inclusion of diverse audiences and employees. Regardless of location, identification or individual circumstances, people from a wider range of backgrounds are now able to gain greater access to the screen industries due to the positive impacts of digital transformation.

Key diversity and inclusion impacts

- ▶ The implementation of digital technologies, most particularly streaming services, can facilitate greater access to film, television and animation for diverse, hard-to-reach and under-represented communities
- ▶ The greater use of digital technologies and the further development of remote and hybrid working can make careers within the screen industries more accessible supporting greater diversity and inclusion
- ▶ The application of digital technologies to learning can enhance the accessibility of learning and development opportunities for under-represented groups and support the growth of greater diversity and inclusion within the screen industries

The experience of each of the case study organisations discussed highlights the importance of responsiveness and proactivity in the face of significant external challenges. As the world slowly emerges from the COVID-19 pandemic it is clear that the impetus for digital transformation is more pressing than ever. The successful longer term digital transformation of the screen industries in Ireland will require a concerted and unified effort from all industry stakeholders. A key challenge and opportunity for Ireland's screen industries will be maintaining momentum into the future and consolidating the existing processes of digital transformation.

A further challenge will relate to upskilling and reskilling. Universities and colleges will be required to enhance their digital offering to better meet the needs of the screen industries so that graduates of creative and technical programmes will be fully equipped with the skills of the future. Agencies involved in further education and training and vocational training including Skillnet Ireland, Screen Ireland and SOLAS will need to further enhance their offerings to ensure that the needs of those seeking to grow or progress their careers within the industry are met. Each of the five case studies included in this report demonstrates that these proactive steps will ensure that successful digital transformation of Ireland's screen industries now and into the future can be assured.



VISION:

CAM: A1
Security scanning

70000
30000
37000
34000
42000
50000
60000

CAM: A2



6

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