MARITIME AR

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IMMERSIVE STORYLAB | MEYOUANDUS |LJMU

1.0 Introduction

The number of short sea international ferry journeys in the UK alone is 20.5 million and the global cruise industry generated an estimated revenue of 39.6 billion U.S. dollars in 2015, The passenger numbers of the global cruise market reached 27.4 million in 2016 and capacity is expected to continue to grow[1]. It's a huge market, and a huge opportunity for new kinds of onboard entertainment.

We believe that this represents a significant global market for the development of a scalable world class entertainment experience, that married with the right IP, could lead to the creation of new opportunities for ferry and cruise operators, content makers as well as new commercial possibilities for the marketing, advertising and tourism sectors.

This research report is intended to inform the design specification and design thinking (WP2) for a new AR Platform specifically developed for the maritime sector, aimed at Ferry and Cruise passengers. Working with users, ferry and cruise operators, and other stakeholders to analysis, design and determine the focus for a new immersive product for the maritime transportation sector with a focus on onboard entertainment experiences for ferry and cruise passengers.

Hyper-localised content delivery requires deep customer insight in context of their current behaviours. This report is intended to show our understanding and mapping of current and future desires/needs/behaviours of end-users and other stakeholders so that our digital platform can offer context relevant, connected and tailored AR content delivery that supports user, as well as business, needs.

1.0 Methodology

a) USER RESEARCH: surveys, field interviews and group focus groups and on-site ethnographic observations on maritime transport to understand current/future needs and behaviours of users;
b) MARITIME STAKEHOLDER PERSPECTIVES; focus interviews group and interviews to address business market dynamics, information needs of the market ecosystem and future potential opportunities.
c) Desk Research on wider sector dynamics

[1] Cruise Lines International Association (CLIA), *'2019 Cruise Trends and Industry Outlook'* Retreived 25th Jan 2019

2. Maritime Ferry and Cruise Operators

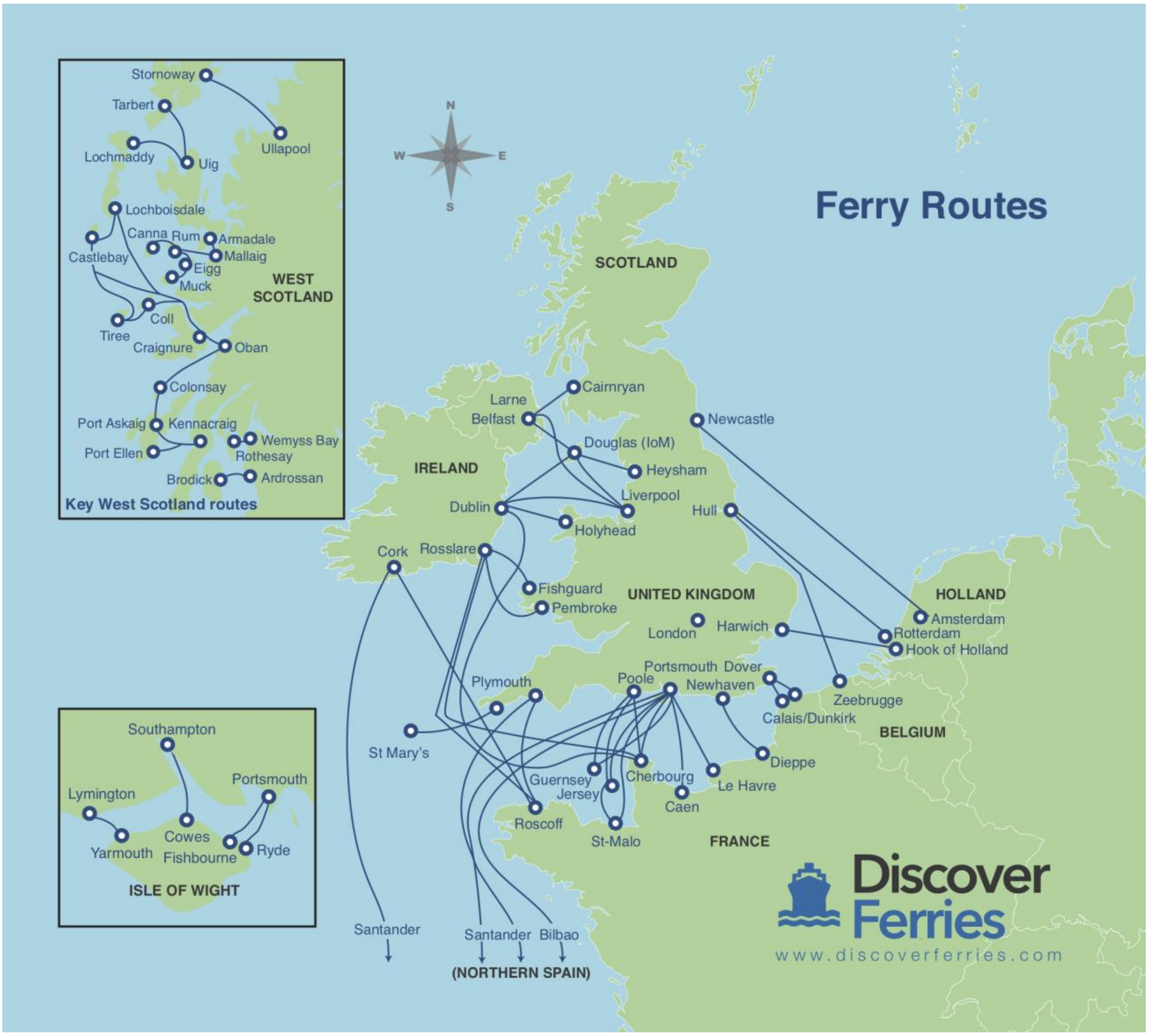


Figure 1: UK and Ireland Ferry Routes

2.1 Service Owners

There are a variety of service owners within both the Ferry and Cruise market between the UK and Ireland. Their service offer ranges from functional price driven travel to luxury high end experiences on cruises. Although their investment immersive experiences and the opportunities vary as much as the markets they operate within, it is clear that these are both growing sectors with a need for entertainment, storytelling and engagement.

2.1.1 Ferry Service Owners

There is an increase in the number of people taking ferries between the UK and Ireland across routes such as Holyhead-Dublin, showing that it is growing as a form of travel[2]. Ferries remain a popular transportation option for passengers, providing freedom and flexibility for families and groups to travel more economically and comfortably together such as families, who need space for children's toys, clothes and other essential holiday items' ferries are a fun and exciting start to any holiday, especially for those who like to enjoy rather than endure their journey.

There are currently 6 operators in the Ferry market between the UK and Ireland, serving a total of 7 primary routes and 39 routes in total. The 3 top ferry operators *P&O, Stena Line* and *Irish Ferrie*s, carry 85% of passengers between the UK and Ireland[3]. Unlike other transport industries, ferry operators 'own' particular routes (with the exception the Holyhead Dublin route which has 2 operators)

Table 1: UK and Ireland Ferry Operators

The P&O Group *P&O Ferries* are British-based company, headquartered in Dover, UK that operates ferries from the UK to Ireland as well as continental Europe (France, Belgium and the Netherlands). The group is owned by DP World, a global port operator originating from Dubai Ports Authority and Dubai Ports International[4]
Stena Line *Stena Line* is headquartered in Sweden and owned by the Swedish Olsson family who founded the company in 1962. 'the largest ferry operator in Europe' Stena operates Europe's most comprehensive route network, with 35 vessels on 21 strategically located routes in Scandinavia, the Baltics and the UK, including five routes out of the UK to Ireland and the continent.
Irish Ferries Irish Ferries operate both passenger and freight services on routes between Ireland, Britain and Continental Europe running two of the busiest routes between Britain and Ireland with 6 sailings a day. The company is a division of the Irish Continental Group, (ICG) who also own the Eucon container line operating between Ireland and the continent. Irish Ferries' flagship, MV *Ulysses*, is currently the largest ferry operating on the Irish Sea in terms of car-carrying capacity. In September 2018, the company launched MV *W.B. Yeats* a new 128m cruise ferry for 1,885 passengers and crew and 1,200 cars to serve the busiest ferry route between the UK and Ireland (Holyhead to Dublin)[5]. Irish Ferries will also launch a second new cruise ferry in 2020, following an investment of £147m with space for 1,500 cars or 330 freight trucks, it will be the largest cruise ferry in the world in terms of vehicle capacity.
Isle of Man Steam Packet Company Limited

[2] UK Department for Transport, *'DfT sea passenger statistics 2017'* 2018. [Retrieved 9 Jan 2019]

[3] Discover Ferries, '*Ferry industry gears up for growth with more than £1billion invested in new ships and facilities'* 2018 [Retrieved 9 Jan 2019]

[4] Companies House UK, 'P&O FERRIES LIMITED – Overview (free company information from Companies House)'[Retrieved 9 Jan 2019]

[5] Falvey, Deirdre, *First Look- Dublin Swift,the first fast ferry to Holyhead* The Irish Times, [Retrieved 10 Jan 2019]

The Isle of Man Steam Packet Company Limited is the oldest continuously operating passenger shipping company in the world, celebrating its 180th anniversary in 2010. The company are owned by the Isle of Man Government who acquired the Steam Packet Company for £124 million in 2018[6]. The company provides freight, passenger and vehicle services between the Isle of Man Sea Terminal, in Douglas, Isle of Man, and five ports in the United Kingdom and Ireland, connecting the Isle of Man to Heysham, Liverpool, Birkenhead in England and Belfast and Dublin in Ireland.

Wightlink.

Wightlink is a ferry company operating routes between Hampshire and the Isle of Wight in southern England. The core routes are car ferries between Lymington and Yarmouth and between Portsmouth and Fishbourne. The company is investing £7 million in a new high speed catamaran Red Jet 7, coming into service between Southampton and West Cowes in early July as a sister ship to Red Jet 6. Wightlink launched Victoria of Wight, a new hybrid car ferry operating between Portsmouth and Fishbourne in Sep 2018.

Caledonian MacBrayne

Caledonian MacBrayne, CalMac, is the major operator of passenger and vehicle ferries, and ferry services, between the mainland of Scotland and 22 of the major islands on Scotland's west coast. The company runs 27 short ferry routes between islands, servicing commuter journeys less than 30 minutes on average and a few longer journeys[7].

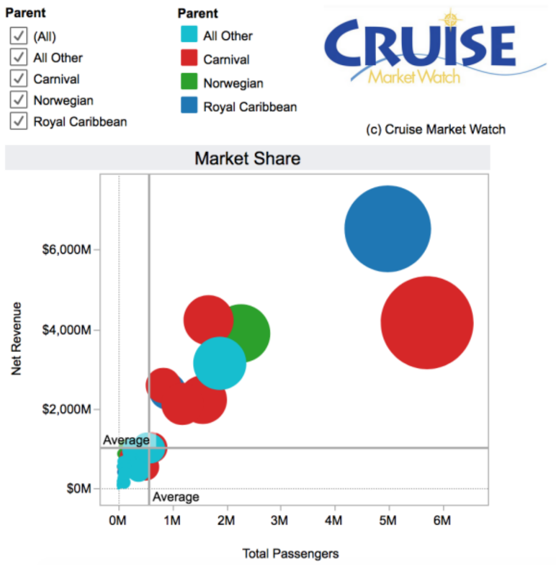
2.1.2 Cruise Service Owners

In 2018, the UK cruise industry contributed €10.4 billion to the UK economy, representing 22% of the European cruise industry's total output[8].

[6] BBC News, *'Tynwald pass plan to purchase Steam Packet Company for £124m'* [Retrieved 9 Jan 2019]

[7] Caledonian McBrayne, *'About CalMac Ferries Ltd' Caledonian McBrayne,* 2019, [Retrieved 20th Jan, 2019]

[8] Bond, Mary, *'Cruising contributed €10.4bn to the UK economy in 2017'* SeaTrade Cruise News, 2017, [Retrieved 9 Jan 2019]



Details

Parent	Brand	% of Passengers	% of Revenue
Carnival	AIDA	4.6%	4.6%
	Carnival	22.0%	8.9%
	Costa Cruises	6.0%	4.8%
	Cunard	0.7%	1.8%
	Holland America	3.2%	5.6%
	P&O Cruises	2.4%	2.2%
	P&O Cruises Australia	1.9%	1.2%
	Princess	6.4%	9.1%
	Seabourn	0.2%	1.2%
Royal Caribbean	Azamara	0.3%	0.9%
	Celebrity	3.5%	5.3%
	Royal Caribbean	19.2%	14.0%
Norwegian	Norwegian	8.7%	8.4%
	Oceania Cruises	0.5%	2.3%
	Regent Seven Seas	0.3%	1.9%
All Other	American Cruise Lines	0.1%	0.1%
	Blount Small Ship Adventures	0.0%	0.1%
	Celestyal Cruises	0.5%	0.8%
	Cruise & Maritime Voyages	0.5%	1.0%
	Crystal	0.2%	1.2%
	Disney	2.3%	2.2%
	Dream Cruises	1.0%	2.2%
	Fred Olsen	0.4%	0.3%
	Grand Circle Cruise Line	0.0%	0.0%
	Hapag Lloyd	0.3%	0.3%
	Hebridean Island Cruises	0.0%	0.0%
	Hurtigruten	0.9%	2.0%
	Lindblad Expeditions	0.1%	0.2%
	Marella Cruises	0.4%	0.7%
	MSC Cruises	7.2%	6.8%
	Orion Expedition Cruises	0.0%	0.0%

Figure 2: Global Cruise Operators Market[9]

Carnival Cruises

The market leader, with a fifth of the market of global passengers. They own 9 cruise lines including: *Cunard Line,* British-American cruise line based in Southampton who are currently the world's largest travel leisure company, with a combined fleet of over 100 vessels across 10 cruise line brands. The company also own and operate *P&O Cruises* the oldest cruise line in the world, having operated the world's first commercial passenger ships in the early 19th century. *Princess Cruises* is another leading line with its headquarters are in Santa Clarita, California.

Royal Caribbean Cruises

Royal Caribbean Cruises Ltd is the world's second-largest cruise line operator. The operator owns fully own three cruise lines: *Royal Caribbean International, Celebrity Cruises,* and *Azamara Club Cruises.* The group also operates Spanish airline *Wamos Air* (formerly Air Pullmantur) and has a joint share of *TUI Travel* and *TUI Cruises,* which operates out of Germany[10].

Norwegian Cruise Line

Norwegian Cruise Line, also known in short as Norwegian, is wholly owned by parent company Norwegian Cruise Line Holdings. Founded in 1966 and based in the US it is the third-largest cruise line in the world The company controls approximately 8.7% of the total worldwide share of the cruise market through its 3 brands *Norwegian Cruise Line*, *Oceania Cruises* and *Regent Seven Seas Cruises*. Norwegian owns two private islands in the Caribbean: Harvest Caye in Belize and Great Stirrup Cay in the Bahamas.[11]

MSC Cruises

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9 'Cruise Market Watch, *Market Share'* [Retrieved 21st Jan 2019]
10 Royal Caribbean *2018 annual report*
11 The San Pedro Sun *'Norwegian Cruise Line unveils Harvest Caye to first visitors'* (2016) [Retrieved 10 June 2017]

MSC Cruises is the fourth largest cruise company in the world, with a 7.2% share of all passengers carried in 2017. The cruise line is owned by the world's second biggest container shipping operator, Mediterranean Shipping Company S.A. (MSC).

Fred Olson Cruises
The operator offer four cruises in Scotland, ranging from Scottish Islands & Lochs as well as 3 cruises exploring in Iceland, Greenland and fjords of Norway

2.2. Ports and Cruise Terminals

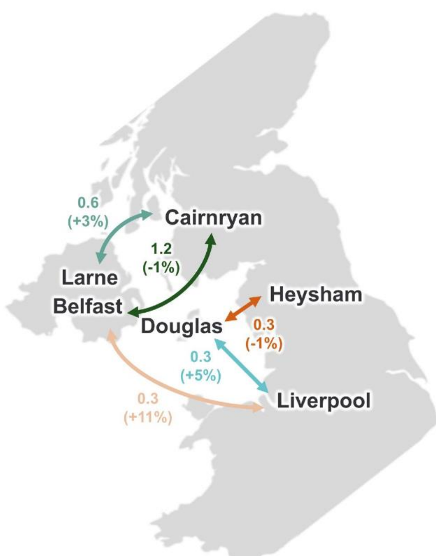

Figure 3: Top 5 international short sea routes by passenger number (millions) in 2017

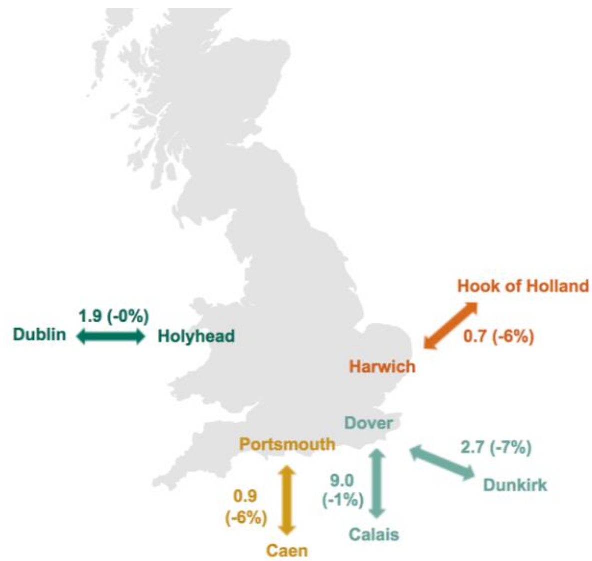

Figure 4: latest year on year change (UK Dept. of Transport; Sea Passenger Statistics, 2017

There are 12 active ports in the UK and 2 in Ireland supporting a wide variety of Cruise companies. In 2017, there were almost 20,000 short sea passengers to the UK by ferry and almost 2,000 cruise visitors[12]

The top 5 international short sea routes (ferry) accounted for 78% of all international short sea passengers in 2017. Over the last decade Dover-Calais & Dunkirk has consistently been the busiest route with between 46 and 51% of the annual international short sea passenger traffic. However, passenger numbers on this route in 2017 were 22%

[12] The San Pedro Sun *'Norwegian Cruise Line unveils Harvest Caye to first visitors'* (2016) [Retrieved 10 June 2017]

lower than a decade previous and 2017 saw a 1% decrease to 9.0 million passengers[13]. In 2017, Holyhead-Dublin passenger numbers remained level at 1.9 million, a 10 year increase of 37% and receiving with Holyhead almost 10% of UK visitors by ferry.

Table 2: UK and Ireland Ports, Operators and linked destinations

Port	Operators	Destinations
Dover ● UK's second largest passenger seaport (ferry and cruise) ● 11.6m ferry passengers ● Homeport of the British shipping company P&O Ferries ● Several daily crossings to France (15 to Calais and 12 to Dunkerque).	*P&O Ferries* _______________ *DFDS Seaways, Fred Olsen* *Saga, World Cruises*	**Ferries:** ● France (Calais and Dunkerque) **Cruises:** South America routes, Canada & USA, Australia and New Zealand, Iceland and Greenland, Norway, Scandinavia and Russia, Holland, Denmark, Mediterranean
Dublin ● 150 cruise ship calls in 2018[14] ● 1,5m visitors a year ● 4,000 visitors to city p/a	*Irish Ferries, Stena Line* *P&O. Isle of Man Steam Packet Co., SteamTruck Ferries* _______________ *Celebrity Cruises, Cunard* *Disney Magic floating resort* *MSC, Norwegian* *Ponant, Royal Caribbean* *Seabourn, Silversea, Viking*	**Ferries** ● Holyhead, Liverpool, Cherbourg, Isle of Man **Cruises** Belfast, Norwa, Iceland, Atlantic Hebrides Guernsey
Holyhead ● Over 2 million ferry passengers every year. ● Connection between Dublin of Ireland and northern Wales and England.	*Irish Ferries* *STENA line*	**Ferries:** ● Dublin
Southampton ● UK's biggest cruise terminal ● Gateway to London	*Royal Caribbean, Fred Olsen, Cunard, P&O Cruises*	Cherbourg, Caen and St Malo in France Spain, Italy, Baltic, Jersey, Guernsey, Russia, Canary Islands, N.Africa, Singapore

13 Ibid

14 UK Department for Transport, *'DfT sea passenger statistics 2017'* 2018 [Retrieved 9 Jan 2019]

● The terminus for internal ferry services including car ferry service to the Isle of Wight ● With 5 berths, it is high volume port[15].		
Portsmouth[16] ● Cruise ships, passenger ferries, and cargo ships ● 3rd busiest passenger seaport in UK ● international and domestic terminals. ● transports ferries to the Isle of Wight.		**Ferries** Channel Islands, Cherbourg, and Saint-Malo.
Liverpool ● Peel Group investment expanding capacity for passenger journeys ● Ferry to Dublin ● 87 cruise vessels in 2019. ● Plans to expand to 150 vessels	P&O *Aida, Austral, Costa Cruises, Cunard, Fred Olsen, Polant, Phoenix Reisa, Princess, Regent, Viking*	**Ferries:** Ireland (Dublin) **Cruises:** Bristol Greenock-Glasgow Southampton Dublin and Belfast, Iceland, Greenland, North Sea Norway, North Pole, Russia, Portugal, Spain, Italy, France and the Canary Islands Bulgaria, Romania, Ukraine, Russia, Greece and Turkey), Canada and USA
Belfast ● The UK's fastest growing port ● 119 cruise ship calls in 2018[17] ● 2 cruise berths ● 200,000 passengers in 2017. ● GBP 15 million (EUR 16,9 million) per year, with projected growth up to GBP 22 million by the year 2020.	*STENA* *Isle of Man Steam Packet Company*	**Ferries:** Cairnryan, Liverpool & Heysham Isle of Man
Cork ● Ireland's only dedicated cruise berth. ● 83 cruise ship calls ● Planned 103 cruise vessels by 2027 ● Hoping to build new terminal	*Holland America, Princess Oceania, Royal Caribbean Celebrity, Norwegian MSC*	**Cruises:** Southampton, Iceland, Greenland, Netherlands
Horwich[18] ● Stena Line uses the port extensively to ferry passengers to the Hook of Holland. ● The port is currently being used for offshore wind farms.	*STENA*	Netherlands

[15] Interview with Kate Green, *Cruise Liverpool*, LJMU Maritime Centre, 25 Jan 2019
[16] WorldAtlas.com *'The Busiest International Ports by Passenger Traffic in the United Kingdom'* [Retrieved 12 Jan, 2019]
[17] The Irish Times, *'Over 400 Cruise Ships to visit Ireland this year'* [Retrieved 11 Jan 2019]
[18] WorldAtlas.com *'The Busiest International Ports by Passenger Traffic in the United Kingdom'* [Retrieved 11 Jan 2019]

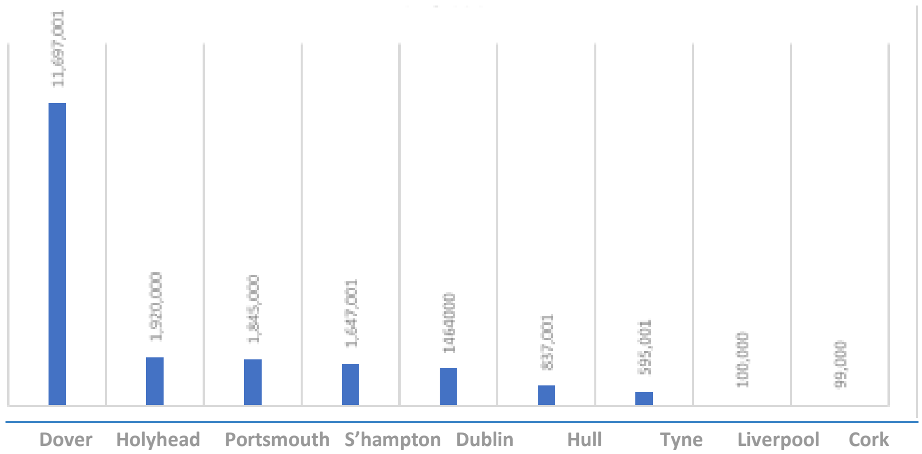

Figure 5: UK & Irl Port Passenger Volume (Dept. for Transport Sea Passenger Statistics for 2017)

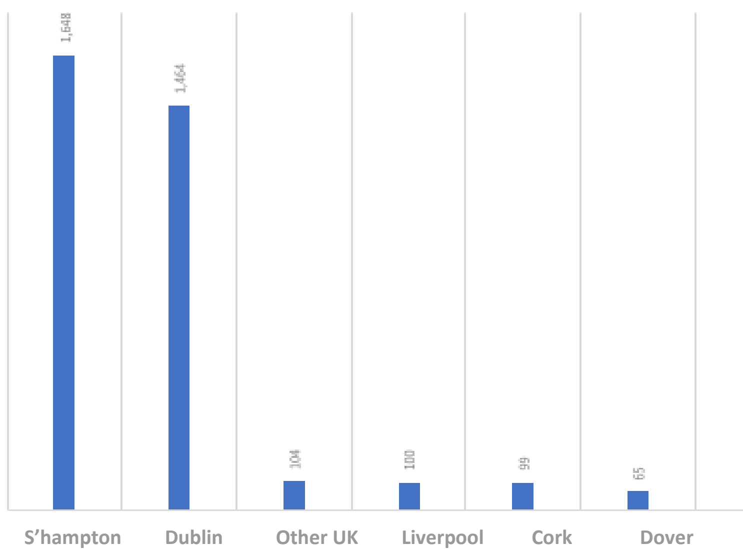

Figure 6: Cruise Passenger visits by port (Dept. for Transport Sea Passenger Statistics for 2017)

Ireland has the most cruise visits overall, with 2.6 visitors to the Republic via cruise line, primarily via Dublin and Cork. A total of 1,094,000 cruise passengers embarked on a cruise from UK ports with 1.9 visitors to the UK and Across the UK and Ireland, Southampton is the main port for cruise passengers, with 85% of international visitors, followed by Dublin with nearly 1.5m passengers. Liverpool and Cork boast the same amount of cruise visitors (circa100,000 passengers).

The most visited British port was Invergordon, Scotland, with an estimated 134,000 cruise passengers going ashore. These port-of-call visits generated an additional €113 million in direct expenditures such as tours and souvenirs.

3. Sector Engagement with Technology

An analysis of existing entertainment will allow us to understand scope the possibilities for AR based entertainment on ferries and cruises and how these reflect existing markets.

3.1 Ferry Sector- Engagement with Technology

3.1 Ferry Passenger Apps

Almost all the main Ferry operators have a passenger app which can be downloaded before travelling and used for various services onboard. We conducted some research onboard two ferries, to see what opportunities these may have. The P&O app provides practical information, allowing users to log in to find details of journey, get to the port, and to book further journeys. It also contains travel related services that such as breakdown cover, accommodation, travel insurance, what to do before you get here, info on travelling with pets and bureau de change. Basic information about the ferry is given including onboard maps and information about the food court, bar and shopping on board.

From our user interviews, most passengers claimed that they were only willing to download Free apps with some passengers agreeing that they would pay between £2 and £5 if it had elements of AR or entertainment. Passengers were accepting of advertising "as long it doesn't take over, or is relevant to the destination". A few mentioned that the sensitivity towards kids and differentiation for different audiences[19].

A few apps have destination ports in mind, removing the confusion of disembarking. Excursion planning app, *getyourguide.com*[20] claims it is '*changing the way people connect to the places they visit, so anyone can create their dream vacation'* allowing non locals to book tours and trips on shore quickly and easily. Practical app, *Wi-Fi*

[19] Ferry passenger Interviews , P&O Liverpool-Dublin Ferry, Jan 14 2019

[20] https://www.getyourguide.co.uk/about/

Finder[21] which uses a local directory, and can scan nearby establishments to '*figure out where to get the best signal'* directing passengers to the nearest coffee shop, bar, or hotspot with Wi-Fi.

3.1.2 On Board Entertainment

With an average ferry journey time of 2.5 hours, and some journeys lasting almost 8 hours, there are key opportunities for major Ferry operators to offer a dedicated form of onboard entertainment. Although this is broadly catered for through a combination Cinema screenings, TV Lounges and specialist areas for children and teens, there is a lack of personalisation, information and satisfaction from passengers about the entertainment available.

Figure 7: Fixed Arcade games on board Irish Ferries and Stena Line's own 'Happy' cartoons for children

Recognised as a key factor, "Keeping the Kids Smiling[22]" is a priority for most ferry passengers. All operators provide dedicated areas for children, with toys, arcade games, screenings and children's entertainers. These range from internet stations and video games areas and dedicated children's play areas. Some operators provide entertainers provide face painting and live shows on their Cairnryan-Lairn line. However from our interviews with regular family travellers, at busy times *"These can get too busy- the ferries need to think about alternative entertainment on other surfaces/places in the ship"*[23]*. These traditional modes of entertaining children seem outdated and unable to cope with demand at peak times.* A key opportunity identified from our interviews with ferry passengers, was the opportunity a long ferry journey provided to do something together. Nearly all parents interviewed on ferries felt that more family interactive activities were needed, such as cabaret and games, Bingo, activities, pool, snooker, and more information about the route and *"distract.. and pass time quicker"*[24]

Most operators have developed their own mascots and animations for young children, which is shown in dedicated kids areas, and available on TV screens throughout the ship. There may be opportunities to exploit these characters more fully using AR or gamification and provide more engagement with the various brands. *Stena line* have invested more than other operators- commissioning their own animated content for younger children and teenagers.

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21 https://www.avast.com/for-android

22 *P&O Ferries*, '*Cairnryan to Lairne, Onboard- Kids Entertainment',* 2019 [Retrieved 19 Jan, 2019]

23 Ferry passenger Interview ,Maritime Centre Liverpool, 25,January, 2019

24 Ibid

3.1.3 Cinema, TV Lounges and Screens

Both *Stena Line* and *Irish Ferries* provide cinema screenings on sailings, which are free on *Stena Line* but ticketed on *Irish Ferries*. P&O does not provide any screenings on either of its two sailings. From our research onboard P&O ferries, passengers were generally disappointed with the choice of content in cinema and games stations on board. "The films don't appeal to me" was a common complaint and a desire for "more choice of things to watch" TV Lounges and screens are available on all lines, allowing brand marketing to passengers. From our observations, the content on screens seemed to be *BBC news* with dedicated children's programmes in summer. From our own user research, there was a general consensus that onboard entertainment was quite limited, with the feeling that there wasn't any personalised offers, or much relevant entertainment provided. Comments from passengers ranged from "*There's not much to do*" and *"waiting for the time to pass is a pain"* and "*feels like a wasted day"*. The responsibility for entertainment rested with parents rather than being curated as an experiences by ferry operators. This seems like a missed opportunity by operators and potential brands to engage consumers and transform this 'wasted' time into a memorable experience.

3.1.4 Smartphones and Entertainment

From our research on *P&O* and *Stena lines*, passengers mainly had smartphones up to 2-3 years old and high spec (iPhone, Samsung's), with older audiences also having tablets and laptops. Smartphones were a primary means of children's entertainment, with parents downloading content and games to keep them entertained before travelling. Some parents noted that smartphones are quite isolating *"My kids (8+16) would just spend all the time on their phones"* with a desire for more family inclusive entertainment.

3.1.5 Internet Connectivity

WIFI Connectivity (provided via satellite) is available on most of the ferry operators between UK and Ireland, although costs and ease of use vary. Stena Line offer free WIFI for all of their 4 routes whereas P&O WIFI needs to be purchased using a debit/credit card via the Wi-Fi splash page or in their retail locations onboard. P&O do not provide any WIFI on their Liverpool-Dublin route.

The connectivity provided by ferry operators for passengers is provided by freely moving satellite antennae, transmitting a signal from the ship to a satellite 35,000 miles away which then sends a signal back down to Earth. Because satellite access is shared and accessed by all users and ships simultaneously this limits the bandwidth available. Connectivity warnings are provided on all ferry operator websites such as; *"to help ensure that the service is as good as we can deliver it, please be modest in your usage"* and "*it will never be as fast as you might enjoy at home or in the office"*

Both, Stena Line and Irish Ferries have removed access streaming media sites such as Netflix, YouTube, online games, Skype etc. In order to compensate, they have provided a number of fixed internet touchscreen points throughout their ships, some of which are only available in premier lounge areas.

3.1.6 Suppliers of Onboard Entertainment and IT Infrastructure

Who are the decision makers in this intermediary space between entertaining passengers and what is the future of this technology? Carus, an IT service provider for the maritime industry, marketing a variety of platforms for onboard transactions. *'innovative IT solutions help unlock insights from every guest interaction to create more valuable relationships, 'enhance service delivery at every stage of the journey'*.

3.2 Engagement with Technology -Cruises

Cruise operators have begun to embrace the possibilities of technology to personalise journeys, reduce pain points and provide 'wow' moments for passengers. Increasingly recognised as a tool to engage passengers before, during and after journeys, Cruise operators are employing immersive and other technologies as a way to create more valuable and personalised experiences.

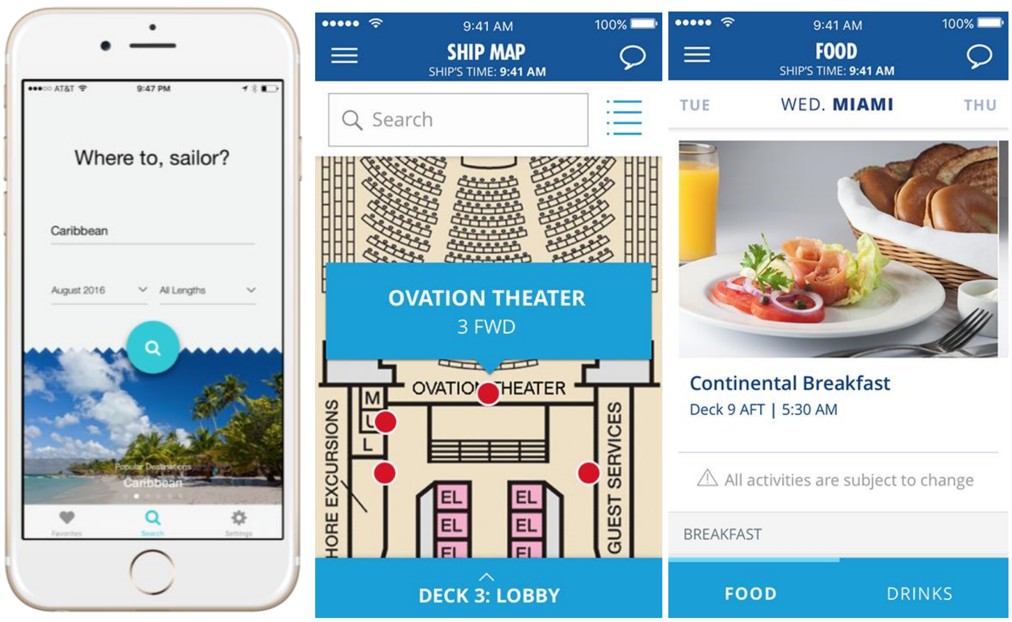

Figure 8: Cruise Picker app & Figure 2: Screen shot of functionality of Carnival on board application

3.2.1 Cruise passenger apps

Royal Caribbean and *Carnival Cruises* both have onboard apps available in some of their regions and ships. Most apps allow passengers to

- Chat with other guests, but get messages from the ship through "Ship to Guest messaging"
- Book and rate shore excursions via the app.
- View menus and place food and drink orders
- State room preferences
- Book tickets and make payments

Other lines, such as *Fred Olsen* and *Norwegian Cruises*[25] have purely functional apps for booking and payment purposes only[26]. These allow passengers to consult timetables, fares and route frequencies and buy tickets with "Plus Card" points. Both Carnival and MSC apps connect with interactive screens around the ship, in addition to mobile devices and stateroom TVs with the MSC app also connecting to a smart watch with geo-location[27].

Other popular apps not endorsed by cruise lines include *Cruise Ship Mate*[28], a '*Tinder* for the sea', that allows the user to make connections with other passengers. There are several apps which act as a 'trip advisor' for cruises, such as *Cruise Picker*[29], *Ripple*[30], *TripIt*[31] and site, *Cruise Critic* which allow potential passengers to view full itineraries, compare cruises on different lines, and monitor prices. There are also more niche apps such as Other

3.2.2 Reducing pain points

From our on-board research, passenger pain points stayed in their minds when choosing to travel, from queues at ports, waiting to disembark and for information on the journey. For Cruise passengers, reducing pain points is essential in creating an enjoyable and pleasurable holiday onboard. Increasingly, technology is being redeployed from other sectors, to try and give passengers better user experiences overall.

In 2018, the four top cruise companies; *Carnival Corporation, Royal Caribbean Cruises, Norwegian Cruise Line Holdings* and *MSC Cruises* "have all come out with tech that promises to make cruising a less cumbersome experience and doing away with some of the aspects of cruising that put travellers off[32]" (i.e. waiting in queues, making bookings and reservations and not feeling personalised as an experience.

Leading cruise operator Royal Caribbean, are using technology to improve the way guests avail of ship services. Jay Schneider, the company's senior vice-president announced the launch of a new app that allows the company to find "*ways to eliminate friction and frustration", "board ships in the time it takes to order fries from the drive-through, skipping check-in lines thanks to facial recognition technology that knows who they are on arrival. They can also sign up for shore excursions, order drinks and make dinner reservations without ever leaving their chairs by the pool"* The app will partner with the company's *WOW Bands*, similar to *Disney's MagicBands*, to open stateroom doors. And, thanks to RFID tags on luggage, guests will also be able to track the progress of their bags to their rooms.

Other cruise liners are also recognising the huge benefits of a user app including Miami-based cruise line, *Norwegian Cruise Line* who have launched an app that allows passengers to check in, book excursions and dinner reservations, and purchase food, drink and entertainment. The app is not unlike those being deployed in other transport providers, such as rail and airline operators, who are recognising the benefits of boost and tracking onboard purchases and transferring passengers on and off the vessel more easily.

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25 Ocner Matias J. and Herrera Chabeli, '*Technology is about to change the future of cruising. Here's what to expect*' Miami Herald, Accessed online Dec 7 2017

26 'Fred Olsen Express' application, Google Play, Google, 2019

27 Ocner Matias J. and Herrera Chabeli, '*Technology is about to change the future of cruising. Here's what to expect*' Miami Herald, Retreived online Dec 7 2017

28 shipmateapp.com

29 http://cruisepicker.com/

30 http://www.ripple-connect.com/

31 https://www.tripit.com/

32 Ocner Matias J. and Herrera Chabeli, '*Technology is about to change the future of cruising. Here's what to expect*' (2017) Miami Herald [Retrieved 7 Dec 2019]

3.2.3 Personalisation

Not a new concept, but an important one- personalised experiences has been recognised as early as 1998 as more valuable to consumers than goods. Joe Pine, co-author of "The Experience Economy',[33] suggests that personalisation "elevates the experience for everyone, not just the highest paying passengers, and not just on its best and newest [ships]," Pine said. "I think it will become the norm … eventually in the cruise industry and in other tourism [entities]."

How is personalisation being used on maritime journeys? How does this translate into consumer satisfaction and ultimately, into business models? Many cruise operators have embraced personalised experiences as a way of providing added satisfaction. *Royal Caribbean* whose mission statement is that *"there's never a moment of boredom onboard* "have experimented with "virtual balconies," on screens making passengers "feel like they've got that ocean view". They have also image of the stars above on your cabin ceiling- these experiences are recognised as transformative for passengers. Royal Caribbean are also planning to introduce virtual reality glasses that can transform the venue into a new landscape based on the cuisine passengers are eating.

Figure 9: Royal Caribbean concept for future staterooms (cabins), imagining floors, ceilings and walls that can change to create your own environment

[33] Gilmore, James, Pine Joseph, *The Experience Economy*, Harvard Business School Press,1999, Harvard

Another offer is “X-ray vision,” a semi augmented reality experience which allows the user to point their smartphone at a part of the ship (including parts where you can’t visit like the engine room or the bridge) revealing what is behind the walls.

3.2.4 The Smart Ship

Many operators are exploring the use of several complimentary touchpoints that allow passengers to have a series of connected experiences through ‘Smart Ships’.

Figure 10: A medallion or wristband worn by passengers on Carnival Cruises allows them to interact with screens, place orders and have a personalised experience

In 2018, *Carnival Corporation company* launched a personalised experience on their flagship, *The Caribbean Princess* using a range of “first-of-its-kind technology” to create unique personalised and geolocated experiences. Passengers are given “a tagalong virtual avatar’ ‘that they can interact with through the ships onboard screens via a medallion that is similar to the Disney Wristband[34] .The personalised medallion, which can be carried in pockets or worn on wristbands or pendants, allows the ships environment and screens to react to a passenger’s approach, adjusting to show the cruiser his or her vacation pictures, order a drink, or locate a family member. The company plan to roll out across the smart technology across the company's entire fleet.

Similar to *Carnival*, *Royal Caribbean* see the benefit in passengers interaction with the technology which will allow them to have better passenger data, offer more meaningful recommendations and focus their sales strategies

[34] Gaudiosi, John, ‘*Your Personal Avatar Can Now Board a Cruise Ship With You’*, 2019, [Retrieved 19 Jan 2019]

more accurately. Clearly seeing the benefit, the company plan have already equipped over 30% of their fleet and plan to roll out their wristband and smart integration across their 48-ship fleet.

3.2.5 Virtual Reality Experiences

VR Experiences have been adopted by a few Cruise operators, who see the benefits for advertising, understanding consumers and providing customer satisfaction.

Leading line, Royal Caribbean have invested in a number of such experiences, from food tasting to trampolining the stars, as a way of providing added wonder for cruise passengers. In 2018, Royal Caribbean revealed that it would be embracing virtual reality (VR) as an advertising venue, using the technology to promote the companies cruise by offering tours and cruises, all within virtual space.

Following a decade of rapid growth and development in China, the most lucrative and largest global cruise market. and introducing the world's most advanced cruise ships to the market, R*oyal Caribbean* have debut their newest ship, *Spectrum of the Seas*. The ship features an iconic 'Sky Pad' - VR bungee trampoline experience located on the raft of the ship. This VR experience will invite guests to wear a head-mounted display to 'transport themselves to another time and planet'. Originally crowd-sourced from a suggestion by the U.K. travel trade to put trampolines and bungees onboard, The VR element allows users to 'leap onto ''podiums and walkways' while 'pop video, dancers, singers and bands are your landscape, with a loud EDM soundtrack'[35]

Figure 11: Royal Caribbean 'SkyPad' an immersive trampoline onboard their 'Quantum of the Seas' cruise ship

As food is such a major part of a cruise (30% of consumer spend), the cruise operator created an experiential dining experience with tech partner, X Studios using a HTC Vive headset and *Leap Motion*'s motion-tracking tech. The user is given 'virtual hands, enabling them to pick up each dish'.

[35]Coulter, Adam, *'Sky Pad Virtual Reality Trampoline on Royal Caribbean Cruises'*, CruiseCritic, (2018) [Retrieved 19 Jan 2019)


Figure 12: Royal Caribbean Cruise VR Experience

3.3 .Other Transport Sectors

Being entertained on transport is rapidly gaining traction as a recognised channel for media, storytelling and advertising. A great deal of investment is being made in the possibilities available in autonomous vehicles and in rail journeys, both of which can guarantee a level of connectivity and underused time.

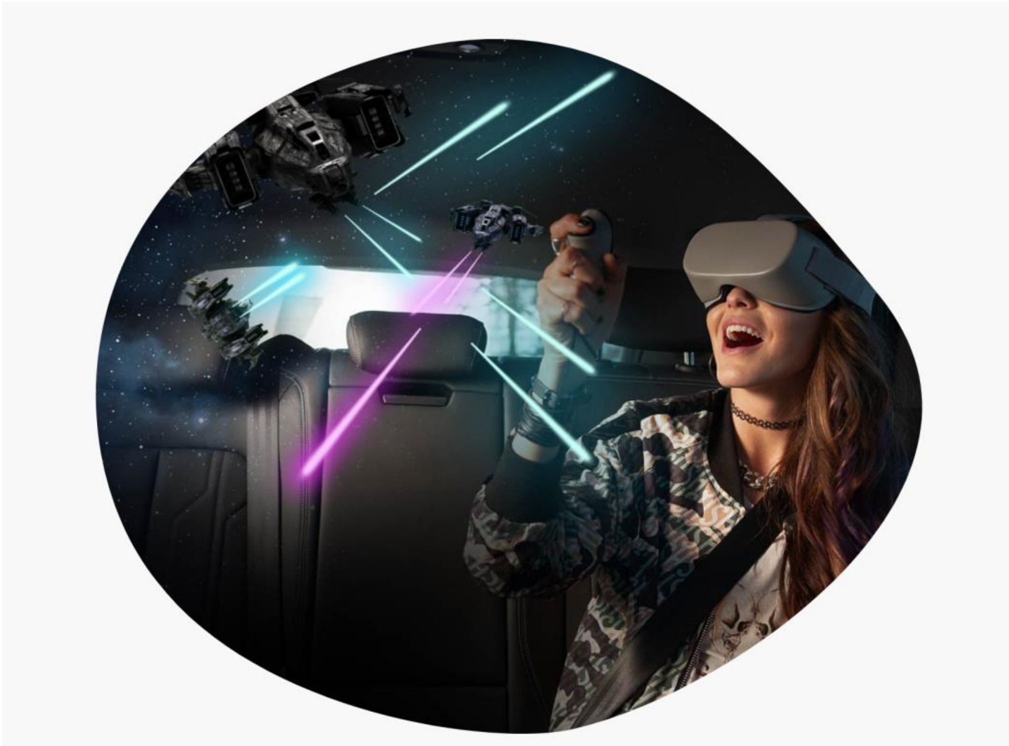

Figure 13: Start-up Holoride's virtual taxi ride turns moving vehicles into immersive experiences

German Startup, *Holoride* have successfully launched a VR taxi ride that *"turns moving vehicles into immersive theme parks combining XR with vehicle movement and navigation data, creating* hyper-immersive experiences. *transit time should be enjoyed.* The company's games and visualisations provide entertainment incorporate the car's real-time movements, such as acceleration and steering and combat motion sickness. Compared to "A trip to a theme park"- *"We believe that the automobile presents an amazing future opportunity to deliver a unique experience for backseat passengers that enhances our storytelling and takes advantage of what's great about being a moving vehicle*" says their CEO[36]

Conclusions

- It's clear that technology is becoming a key differentiator for high value cruise lines and considerable investment is being made into this sector.
- Cruises are adopting data gathering wearables that allow passengers to have linked personalised experiences on board with Royal Caribbean and Carnival being main investors.
- The more experimental areas using immersive experiences are within the cruise sector, primarily in regions such as China, where there is a growing younger market with a thirst for new and exciting experiences and luxury.
- Ferry passenger volumes are far higher than cruises in UK and Irl but are likely to adopt technology 5-10 years after cruises

[36] O'Kane, Sean *'Audi and Disney want to spice up your Uber ride with VR'* The Verge [Retrieved 23 Jan 2019]

4.0 Place Marketers/Tourism

What are the key places and markets for maritime passengers? How valuable are mixed reality experiences to place marketers? How are they already being employed and how successful have these interventions been?

4.1 Tourism Market between UK and Ireland

Figure 14: 'Tips for Monster Hunting' campaign by VisitScotland actively appealed to family and younger markets seeking natural beauty

In 2017, 7% of visits to the UK were by sea[37] (excluding the channel tunnel), generating almost £300m in GDP. There were 700,000 visits from the Republic of Ireland to the UK. In the same year, there were over 4.87 million visitors to the Republic of Ireland from the UK, Britain being the primary tourist market and visits by sea making up 8% of all visits. Where are the most popular destinations in the UK by sea overall? London is the primary destination for the majority of travellers coming through the ports of Dover, primarily with the next most popular destinations being Scotland, Wales (via Dublin-Holyhead ferry routes) and Northern Ireland[38]. Some Cruise docking ports such as Liverpool, have capitalised heavily on these lucrative markets as a gateway to place making, while other ports such as Southampton are seen as transport gateways to London.

4.1.2 Republic of Ireland- The Market

Ireland has a number of key cruise ports, including Dublin, Cork and Belfast. The "central corridor" Holyhead and Liverpool ferry routes to Dublin the best-performing bringing 2.13 million passengers across the sea with 55 crossings a week.

[37] Visit Britain, *'2017 Snapshot'* (2018) [Retrieved 11 Jan 2019]
[38] Visit Britain, 'Markets- Irish Republic' 2018, [Retrieved 11 Jan 2019]

Tourism Strategies in the Republic of Ireland is shared between *Failte Ireland*, who provide insight into the experiences and attractions and *Tourism Ireland,* who analyse tourism market as a whole and aim to penetrate key markets. During the course of our research, we spoke to both organisations regarding their strategies and knowledge and use of Immersive storytelling.

Figure 15: Failte Ireland's Wild Atlantic Way campaign is one of 4 place making strategies to distribute tourism and its benefits more evenly around the Republic of Ireland.

Ireland has struggled from an over concentration of tourism in major cities (Dublin, Cork) and a failure to distribute tourism around the country. In order to counteract this, In order to divert visitors from Dublin, their strategy was to split the marketing of the country into 4 distinct 'places' which tourists can enjoy. The *Wild Atlantic Way*, extends for 2,500 km of roadway along the West coast, *Ireland's Ancient East* is a touring region encompassing 17 counties on the eastern side of the Republic. A third region *Ireland's Hidden Heartlands* encompassing the Shannon region and Beara-Breifne Way was launched in July 2018. Alongside these regions, a series of 'experiences' were created, allowing tourists or operators to pick and choose from activities, such as sheep gathering, basket weaving or brewing. These 'experiences' may well provide rich story content for immersive experiences.

Figure 16: A range of 'try before you buy' 360 experiences were developed by Failte Ireland to help adventurous overseas visitors to sample activities and visit regions such as the Cliffs of Moher (above)

In 2016, *Failte Ireland* released a series of 360 videos of some of these experiences along their *Wild Atlantic Way* campaign, mainly with the purpose of giving potential visitors to 'try before they buy'. From surfing in the Cliffs of Moher to mountain biking in the Burren, pre- experiences were clearly marketed at more active, younger demographics, with 360 being an ideal way to do this.

Despite these successful efforts to disperse tourism, Dublin still dominates the ROI, with Dublin port accounting for 60% of all vessel arrivals in Irish ports[39] and 75% of all visitors to Ireland to sites in the capital. The most visited tourist sites include *The Guinness Storehouse,* attracting 2m visitors a year, Dublin Zoo, National Aquatic Centre, Dublin and the Book of Kells (Trinity College, Dublin). Considering the volume of maritime tourism, it is surprising that there have not been more uses of immersive storytelling or experiences in Dublin[40]. Although commercial 360 tours have been employed, such as KBC bank sponsored *experience Your World,* (a 360 tour of Dublin's music studio, properties, landmarks and city neighbourhoods) there has been little use of immersive place making to bring stories to life or to target consumers in an imaginative way.

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[39] Central Statistics Office, Ireland, '*Statistics of Port Traffic, 2017*' [Retrieved 25 Jan 2019]

[40] Conghaille, Pol *'Revealed-Irelands top 20 tourist attractions paid and free'* (2018) [Retrieved 30 Dec 2019]

4.2 Immersive Placemaking

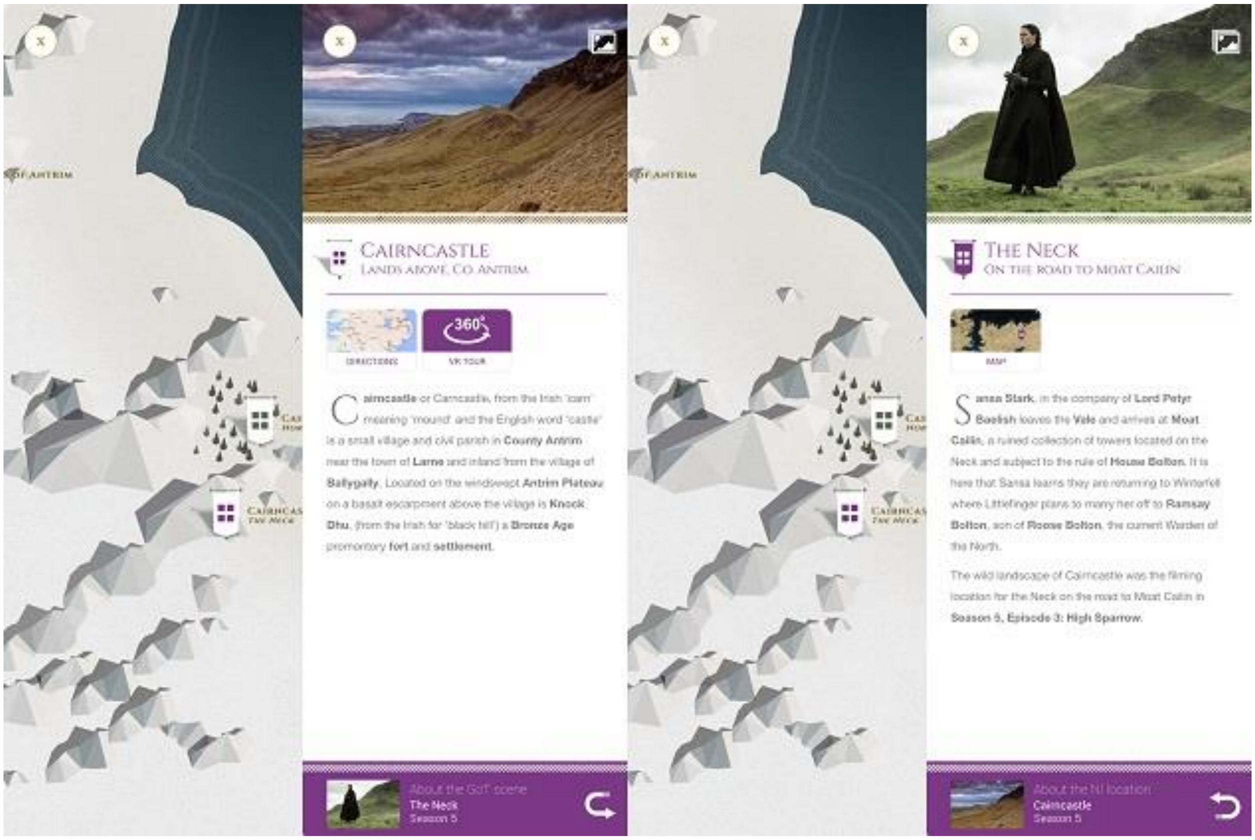

Figure 17: Tourism Northern Ireland have capitalised on the huge success of HBO show, Game of Thrones to create AR experiences that can be enjoyed in remote areas where the show was filmed.

The maritime heritage of ports and the associated place making is an important part for city economies. Up to 5000 residents can come to see a cruise liner off in Liverpool, which trades heavily on its rich history to attract more visitors and repeat visits. Dublin port are actively interested in seeing how immersive could reconstruct their Victorian heritage while Liverpool are developing a new cruise terminal, which might have scope for engagement with screens. The North of Ireland has employed immersive tools to enable place making, perhaps better than any of the other maritime regions in the UK and Ireland. By capitalising on the *Game of Thrones* (GOT) experience and working with key entertainment leads, HBO, Tourism NI have worked to create a number of legacy attractions which have drawn millions of tourists to the region across a range of transport providers.

A dedicated "Game of Thrones' app, developed by *Discover Northern Ireland*, allows visitors to explore key filming locations, with over 25 scenes from Seasons 1-7 are featured on the app, with detailed information on each scene and where it was filmed, as well as official stills from the show. The 10 Doors of Thrones can also be found on the app.

The success of the GOT campaigns, which have led on from NI Screen allows the region to overcome the 'bottleneck tourism' of visitors to main cities, such as Belfast, and 'push' visitors out to more remote areas, distributing not only the wealth created from these visits, but reducing queues and pressure on key sites. Tourism NI's Chief Digital Officer, Dave Vincent notes; *"In tourism, augmented reality has the power to help visitors with smartphones and other digital devices navigate the destination in any language. It can plug the 'expectation* *gap' at sites of historic or cultural importance, by creating or recreating life via a digital layer over the physical environment"*[41]

4.3 Technology in place marketing on Cruises

How can technology help to improve place marketing? Either by helping passengers find out where to go or connect with relevant activities on shore?

On average, cruise passengers spend 6-10% of their holiday budget on shore excursions. Although this may seem small, this spend has huge added value to economies of ports and places. All Cruise lines have a keen business in organizing and booking excursions for guests. From ports such as Liverpool, cruise passengers will travel to Chester, Conwy Castle and the Lake district as well as close city attractions. Sold through on-board reps, cruise operators can make 50% on actual costs (trips can cost $100-$400). Excursions are most popular with older audiences with younger audiences being more likely to book their own activities on shore[42]. Some cruise and external applications have attempted to allow booking and 'tasters' of these excursions.

VirtualCruiseTour is an AR/VR-based application dedicated to ship cruises' guests for the promotion of organized shore excursions. It can be exploited also in travel agencies to showcase future customers the sites of interest that can be visited during the cruise. The AR module allows augmenting a map showing the cruise route, the ship current position and the ports in which the liner will stop. Tapping one of the port (or the ship), the user is shown more details about the shore excursions organized for that stop (or the ship facilities) and has the chance to experience the site of interests watching 360° pictures or videos either in an immersive (VR) or non-immersive mode. The experiment evaluates the customers' purchase intentions and their knowledge of the product in comparison to traditional marketing media (web sites and brochures).A pilot study to validate the application as a marketing tool suggests that onboard immersive experiences related to destinations resulted in more purchases[43]

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41 *'Tourism NI invests £200k in Augmented Reality Challenge'* Tourism Northern Ireland, (2018)

42 Interview with Kate Green, Cruise Liverpool, 25 Jan 2019

43 *VirtualCruiseTour: An AR/VR Application to Promote Shore Excursions on Cruise Ships,* Arlati, Sara, Spoladore, Daniele, Baldassini Davide, Sacco Marco, Luca Greci

Figure 18: Holideck VR, developed by Royal Caribbean allows the general public to enter a virtual portal to a cruise experience

Royal Caribbean's *HoliDeck* VR is part of the brand's new marketing campaign *'Where Everyone Gets What They Need'* there are still some potential consumers who are interested but not convinced if cruise holiday is for them. A brainchild of iris' in house 'Fuse" Production team, the *HoliDeck VR* is a fresh promotional strategy that involved the hosting of onboard entertainment, demonstrating that *there's never a moment of boredom onboard*. The future use of *HoliDeck VR* and its ability to convince consumers to book a cruise is yet unknown as it has only been shown at trade fairs as yet.

Disney has a storytelling adventure called *Ghost Voyagers* (available on the *Disney Fantasy, Disney Dream, Disney Magic*) – On a particular night, the ship is passing through mysterious waters of history and legend where several strange occurrences have happened. Equipped with state-of-the-art ghost hunting gear, teens and tweens find out if the spooky phenomena are real or imagined and get to look for passengers.

Conclusions

- Dublin's largest tourist attractions and Dublin Port may be interested in visitor experiences in place or online as market has not really been explored (Trinity, Dublin Zoo, Aquatic Centre)
- Failte Ireland could be an interesting partner to translate their experiences into immersive formats for their Free Independent Travellers
- HBO may be interested in marketing their Game of Thrones experiences on cruises and ferries, or harnessing Out of Home advertising
- 'Try before you Buy' and onboard trip planning seems an important market for Cruise Lines and could be routes to direct business with the lines.

5.0 Advertisers and Out of Home

New shifts in advertising, branding and marketing have been seen in recent years- from new types of content delivery, interaction and partnerships for brands. We will explore what brands are relevant to this sector and how Out of Home and location based marketing has great potential to create opportunities for the maritime sector.

5.1 Brand and Sector Opportunities

What are the likely brands that may invest in immersive experiences in maritime, see their value and influence its future? From our research, we identified the main brand partnerships associated with Ferry and Cruise operators in the UK and Ireland, and also explored the likelihood of future brand partnerships, according to the end users and consumer spending patterns.

5.1.1 A new marriage of gatekeepers and entertainers

The automotive industries have already recognized the value in the future of mobility and have started to form brand partnerships that would not previously have worked collaboratively together. Music streaming services and satellite radio services are forming partnerships with automakers to provide the default audio service in vehicles. These previously disparate brand groups are being coined as 'gatekeepers' and 'entertainers' by those working in the area of the emergent media/transport sector across autonomous vehicles, rail and other areas:

Gatekeepers of data, such as transport providers or location data holders, may never have worked with media organisations before, but increasingly have *'the details around customer journeys and preferences'* needed by entertainers to target ads and content effectively. **Entertainers** include traditional and emergent media content creators (Video, gaming, music companies and advertisers)[44] who can offer the engagement with passengers, delight and transform journeys and use brand loyalty to support onboard storytelling. Entertainers depend on the knowledge of routing, timing, and passenger preferences managed by Gatekeepers to effectively curate and recommend content for every journey[45].

Table 3: Different sectors 'Gatekeepers' and 'Entertainers' who are beginning to work together on OOH advertising

Gatekeepers	Entertainers
Gatekeepers of massive amounts of valuable data include ● Location-based analytics services companies ● IT infrastructure/satellite providers ● Transport providers and Maas providers (who hold data on passenger behaviour)	Potential target gatekeepers include: ● Phone companies (Vodafone, EE, O2,3 etc.) ● Maritime Satellite Providers (Telenor Maritime, SES Networks) ● Infrastructure and IT (Carus, CISCO) ● Immersive Hardware Providers (Samsung, Huawei)

[44] Merchant, Greg, Pankratz, Derek.M, Schlaff, Dan, *The Future of Mobility-Opportunities for Media and Entertainment Industry* Deloitte Insights
[45] Ibid

	● Travel sites: *Trip Advisor, Cruise Critic* etc.
● Both Traditional and emergent media, games and advertising sectors have the IP and the storytelling/entertainment content capabilities to create experiences. ● Content holders ● Advertising and Marketing sectors ● AR/VR/MR sectors	Potential UK/Ireland Entertainers include: ● Content owners relevant to place (HBO, WB etc.) ● Family and kids content ● Heritage and cultural content ● Place and lifestyle brands (Guinness, Audi etc.)

5.1.2 Potential Brand Sector Opportunities

Figure 19: Diageo £150m Immersive Whisky Distillery Experience in Edinburgh

The Food and Drink Sector

With 30% of cruise travel passengers spending on food and drink[46], it is hardly surprising that this sector has previously invested in advertising opportunities on maritime consumers. Food and drink brands, have also been one of the first sectors to embrace immersive experiences as a way to target consumers alongside other Fast Moving Consumer Goods (FMCG) sectors[47]. In 2014, drink brands such as *Pepsi* were one of the first brands to embrace AR tools, adorning bus shelters with flying saucers, attacking robots and loose tigers. Food and Drinks retailer, *Diageo*, who market some of Ireland and the UK's most iconic brands including *Guinness* and *Baileys,* have invested heavily in immersive experiences, partnering with *VisitScotland* on £150m distillery experiences in Edinburgh '*bringing the story of whisky production to life*[48]. The global giant is also interested in consumer data across different geographic markets, having invested in a new IT infrastructure that promises to link 1,300 of their campaigns across 50 countries. Using digital advertising or sponsorship solutions through immersive storytelling may help them to gain a better understanding of shifting consumer needs[49]

Iconic brands such as *Guinness* (the Guinness storehouse in Dublin receives the highest number of visits in Ireland) would be ideal subjects for a heritage or immersive sea experiences. Ireland also trades heavily on its food market- with most of the merchandise at its travel points being food related. Irish Former Woollen Mills company, *Avoca*

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46 Cruisemarketwatch, 'Financial Breakdown of typical cruiser' 2017,[Retrieved 10 Jan 2019]

47 Exterion Media Group, The Outdoor Media Landscape is Changing, [Retrieved 10 Jan 2019]

48 Glenday, John, *'Diageo bets big scotch whisky tourism with 150m investment in distillery experiences'* The Drum, (2018) [Retrieved 5 Jan 2019]

49 Warc, 'How Diageo drives marketing effectiveness' (2017) [Retrieved 10 Jan 2019]

have found food markets far more lucrative than their clothing line, deciding to expand only in these areas. Other brands such as *Butlers* chocolates, *Kerrygold* and others have relied heavily on the myths and storytelling of Irish heritage to boost international sales in Europe, Asia and the US.

The Automotive Sector

As ferries are so obviously bound up in the car experience, it would make sense that auto brands are a key part of a whole journey- from home to sea to destination. Many manufacturers are seeing a sharp decrease in demand within younger car buyers are considering how they can strengthen existing markets, differentiate themselves and diversify. 'Automotive manufacturers have been the first to really grasp the potential of this (AR) technology' and location specific experiences that allow users to search out ads and engage far more than traditional passive methods[50]. So which brands are likely partners for Maritime AR? Considering the main auto market is 35-50 family car owners, we need to consider the most popular brands driven by this demographic. Ford is the UK and Ireland's most popular car among family markets, with robust models ideal for driving in rural terrain and hosting children, pets and instruments. *Audi* have already committed to considerable research of immersive experiences in vehicles but are probably the top end of the ferry market and more suited to the business traveller.

[50] Exterion Media Group, '*The Outdoor Media Landscape is Changing*', [Retreived 5 Jan 2019]

Figure 20: SKODA's 2018 campaign uses mythical imagery to sell its latest models to Ireland and UK passengers

Officially Britain's most popular family car, *SKODA* are an interesting brand to approach. Their recent campaign marketed heavily at Dublin Airport shows the car at various points of mythical Irish history. *SKODA* (owned by Volkswagen) already have their own AR car visualising app which allows users to visualise their car in the location of their choice and could possibly be adapted to tell stories more creatively?

5.2 Digital Out of Home

5.2.1 Out of Home (OoH) Advertising

Out of Home (OoH) advertising that reaches the consumers while they are outside their homes, has until now, been considered a limited market for a number of advertisers. The 'static medium' of digital and mobile ad-spend which previously marked the majority of spending and growth in the market is rapidly is '*evolving towards a technology enabled 'ecosystem' that connects with consumers on the go'. 'Location-based mobile marketing'* uses mobile advertisements which may appear only when a mobile user is in close proximity to a certain store or service provider using personal data and location services to *'personalise ads, often via search engines, based on user preferences and known habits'*[51] Technologies such as NFC, QR, Augmented Reality, Geo Tagging, Facial Recognition are being employed at touchpoints such as shopping centres, airports, cinema halls, where there is high proximity of consumers'[52] Augmented Reality is poised to enter the mainstream; according to one estimate, spending on AR technology will hit $60 billion in 2020 which ads a further potential disruption to the outdoor media ecosystem.

Table 4: Strengths and Weaknesses of Out of Home Advertising (Vanden Bergh and Katz (1999), Shimp (2003))

Outdoor Marketing Strengths	Outdoor Marketing Weaknesses
● Relatively inexpensive, ● High reach and frequency;	● Location availability limitations ● Mass reach

51 Greg Merchant, Dan Schlaff, Derek M. Pankratz, *Experiencing the future of mobility,* Deloitte Insights [Retrieved 3 Jan 2019]
52 Kohli, Aanchal *OOH media is evolving towards an ecosystem of tech integration: Kinetic Worldwide's Amit Sarkar* Best Media Info (2015) [Retrieved 3 Jan 2019]

● Capitalising on increasingly mobile society, ● 24-7 visibility ● Numerous creative possibilities; ● Precision targeting capabilities.	● Message length limitations ● Message alteration inflexibility, ● Environmental distractions ● Interactivity limitations ● Difficulties determining return on investment

Figure 21: British Airways 2014 'Lookup' Campaign uses local flight data to dynamically integrate the content of the ad with context in the real world. created by Ogilvy One (Location-based and Location-aware)

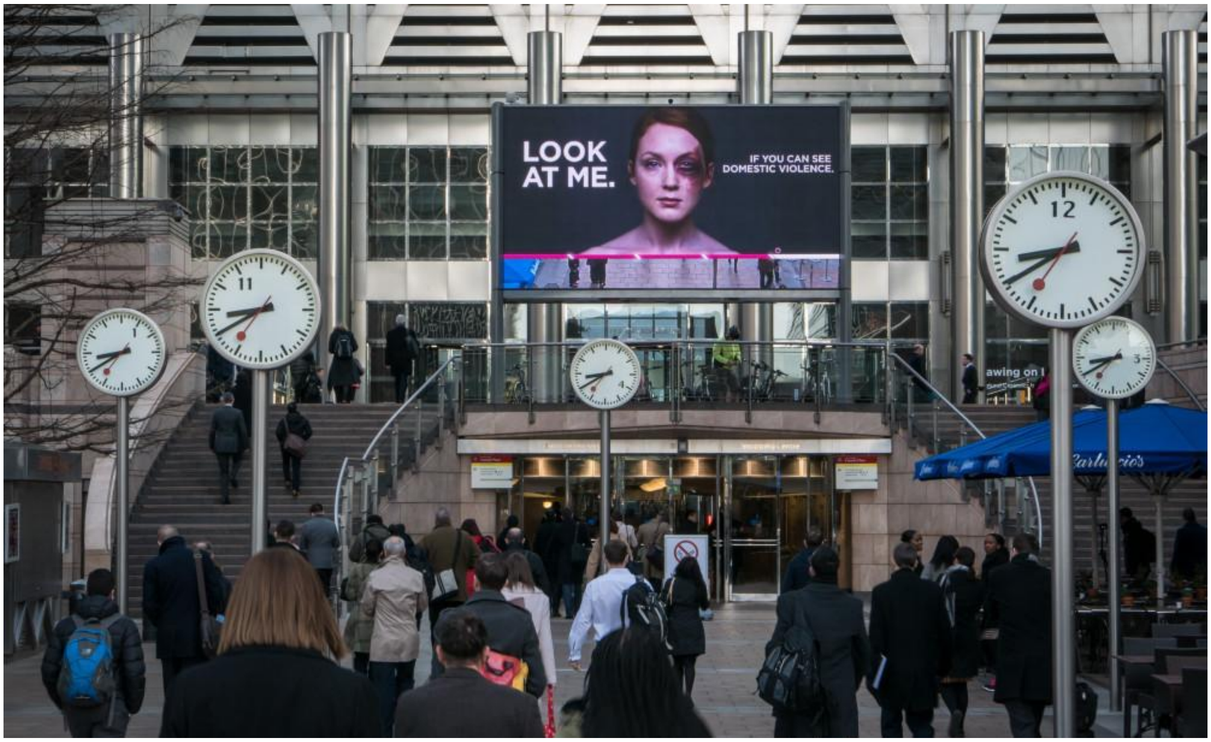

Figure 22: Women's Aid 2014 campaign 'If you can see it, you can change it' (created by WCRS and Ocean Outdoor) that uses face recognition sensors to dynamically change the content based on how many people are engaging with the ad. (Location-aware).

Figure 23: Exterion Launches a New 'Digital Channel' in London. Each bus will carry a digital screen on its side. The technology allows brands to run imagery and copy that is pertinent to the locations of the buses, for instance according to nearby shops or London

5.2.2 Industry Needs and Behaviours

The Industry is rapidly evolving the way digital screens are used, to create a more personal experience for consumers and merging online and offline behaviour and interactive hardware. These new screen approaches are categorised as 'connected' or 'smart' screens, as they are both online and take advantage of much of the underlying technology and software deployed on smart phones. To match the evolution of the technology, the industry is having to quickly adapt its processes and related systems in several key areas. According to a recent report from *Exterion Media* , the personalisation of technology and the interactive behaviours it encourages are redefining OOH's role including an amplification of many of OOH's traditional strengths and providing a world of new opportunities for brands to engage in new ways with consumers. The same report compares the earlier and current approaches to OOH as "once a 'notice and do' medium, now it's a 'think and feel' medium...triggering interaction and launching experiences." (From 'The Outdoor Media Experience is Changing. Exterion Report 2015)

Industry research shows that generally advertising is seen as a welcome intrusion and users would welcome interacting with OOH advertising on their mobile devices. Particularly if it has contextual relevance to them in exchange for services or experiences that benefit them.

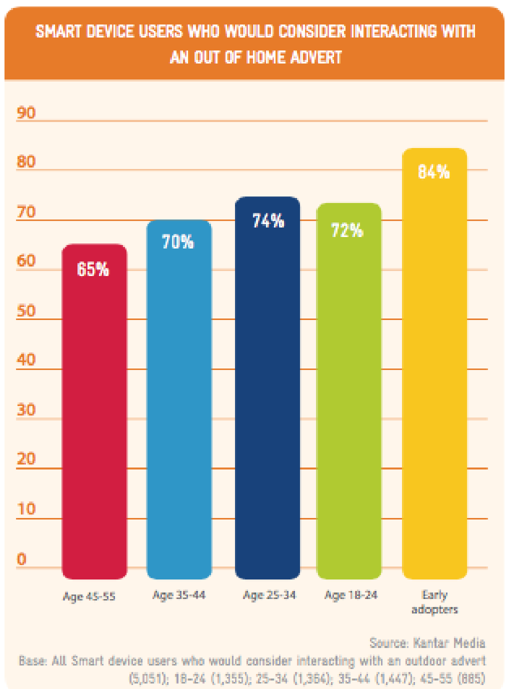

Figure 24: 'Smart Device users who would consider interacting with an outdoor advert' Source Kantar Media

The following diagram illustrates some considerations around value exchanges that need to be thought about. Which identified that in addition to basic fact finding/information sharing needs, the audience also expects a 'value exchange' in terms of monetary and entertainment:

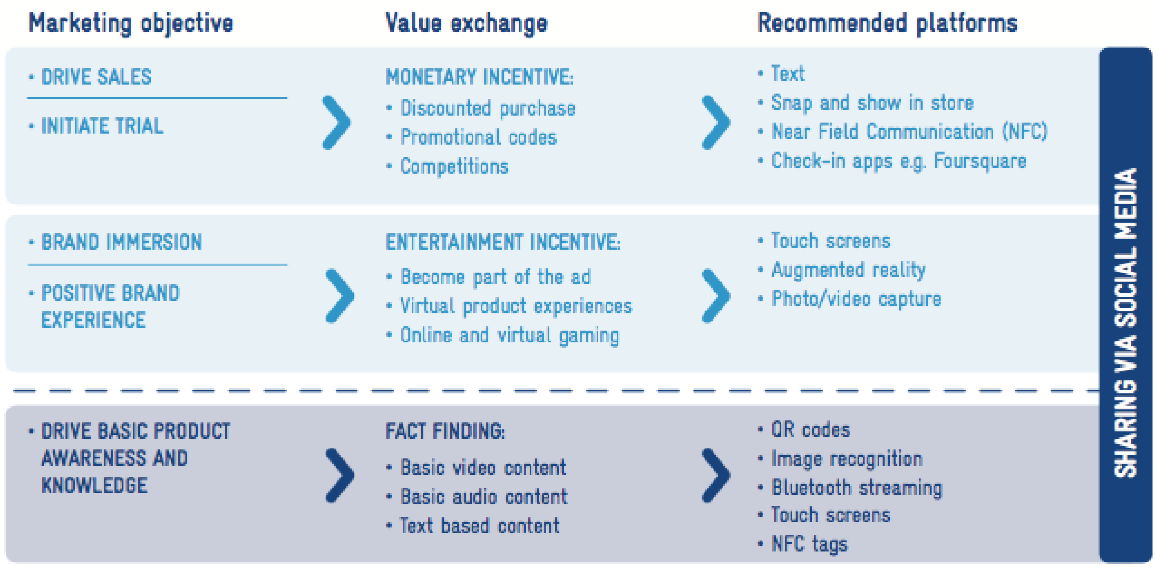

Figure 25: From Exterion Media Report, 2015

Two critical factors influence the potential for engaging consumers with interactive poster experiences[53]:

Table 5: 'Critical Factors for engaging consumers'

Dwell-time	The average length of time consumers stay in a location and are exposed to a poster. The vast majority of roadside poster sites are not high dwell-time locations, but bus-shelters and many transport and shopping environments have higher dwell-times, whilst some retail, airport and transport (cross-track) have considerable engagement times.
Download Speed	Rate at which the installed technology can download or receive data from a consumer's handset.

Amplification is also an important factor when advertising can actively engage people in an experience such as sharing on social media, impressions and how much an experience is shared beyond its initial location or group.

55% of all respondents with a social media profile have used social media to share information about promotions or offers whilst Out of Home. 74% of Early Adopters (who have a social media profile and are smart device users) shared promotions with their friends strongly indicating that this type of behaviour is only set to continue[54].

5.2.3 Personalisation

[53] Exterion Media Group, '*The Outdoor Media Landscape is Changing*', [Retrieved 5 Jan 2019]
[54] Ibid

Personalisation can involve consumers or their behaviour passively or actively identifying themselves to screens and affecting the content they receive. On the one hand this can mean users actively volunteering their online profiles to access a very tailored experience similar to standard online behaviour. On the other hand the screens themselves can understand and make assumptions about the people in front of the screens. This could involve identifying characteristic of the person's (age, gender, sentiment) or by analysing the context (location, time of day, environment). For example a screen at a bus stop might decide that the people nearby are waiting for the next bus and that most people taking that bus may be going to a particular location, so could serve an advert about that location. *"This development is not the result of conspiracy to remove people from collective experiences. It is instead an unintended side effect—a negative externality—of how advertising, big data, and content production have come to coexist over the past two decades"*[55]

5.3.4 Native Advertising

A native ad is textual, pictorial, and/or audiovisual material that supports the aims of an advertiser (and is paid for by the advertiser) while it mimics the format and editorial style of the publisher that carries it. The most simple example of this is a sponsored tweet that *Twitter* integrates into 'useful' users streams attractive to sponsors. More elaborate versions include entire articles written by firms specializing in "seeding" native advertising articles by companies like *Social Seed* (2012, para. 3). The company describe their mission for *Samsung* to "*amplify their seductive motion content"* through a video that would *"achieve press placements and organic, editorially-focused traffic in several global markets.*" It accomplished the goal with 125,000 views through "35 placements on highly targeted sites, such as *Gizmodo.*" Moreover, the *Samsung*-driven editorial matter ignited "significant engaged commentary."[56]

As publishers become used to advertisers' micro targeting and as native advertising becomes a part of their everyday landscape, it is easy to see how publishers might develop this third dynamic: They will begin to vary their own material based on their visitors and what they know about the visitors. Advertisers have for over a decade been using techniques for testing whether ads with certain features will draw engagements or clicks. It is not much of a stretch to expect that, facing growing advertising competition from search engines and social networks, straightforward content publishers will use their data to change articles or videos on the fly based on what they know of visitors. [57]

5.3.5 Decline of Passive Advertising

Traditional models of advertising have declined the 21st Century from passive 'talk down' campaigns to more interactive methods. In 1994, "The Death of Advertising." foresaw "*Mass customization and flexible manufacturing subsume the concept of mass production and mass advertising*," (Rust 1994). At a time where the digital world was just coming into being, this paper argued for a more digitally native way of thinking about advertising that works with the medium specificities of two way communication platforms, rather than simply a one way communications medium. Interestingly they predicted that by 2010, much of advertising's role and methods will have assumed this new model and their predictions can be largely validated through the huge shift that social networking and search, and the rise of 'native advertising', created from 2008 onwards.

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[55] Couldry, Nick, *'Advertising, Big Data, and the Clearance of the Public Realm: Marketers- New Approaches to the Content Subsidy'* (2014) [Retrieved 3 Jan 2019]
[56] Ibid
[57] Ibid

5.3.6 Conversational Advertising

Millennials and the generation that follows comprise 46.4% of the total US market are the most appealing demographic for brands. Although both generations exhibit different traits, both value community, conversation, and authenticity. *'They hate being spoken down to and not being given a voice'*. Having grown up with an ever-increasing array of participatory media channels, '*they especially hate undeserved impositions on their time and attention sometimes referred to as distraction advertising'*[58]. A recent study by *Lithium Media* found that a majority of 16- to 39-year-olds stop using social networks where they *'feel like they're just targets for advertising'* "They want it to be a **conversation**, they want to **engage**," *"It has to be a two-way interaction if brands want to succeed. It can't be one way any longer."* The study reveals that '*for a successful new model of advertising to emerge that it will need to consider questions around participation, experiential, community, conversation and authenticity.*[59]

5.3.7 Experiential Marketing

Interestingly a number of reports have noted about a recent rise in a shift of industry spend towards 'experiential' forms of marketing that are shareable, participatory and rooted in strong creative concepts. In their book The *Experience Economy: Work is Theatre & Every Business a Stage 2011,* authors Pine and Gilmore note potential fundamental shift in consumer psychology around how they want to engage with brands.

Many companies are engaging with this concept of experience in both retail, events as well as mass marketing campaigns. Nike Plus, Red Bull's Events strategies and Apple's 'Town Square' store strategies are all examples of experiential 'lived' and participatory marketing. One issue for experiential marketing faced by advertisers and brands however, is often questions of scale, and being able to scale up the effectiveness of events. Experiential marketing tends to focus on unique, one-off events or campaigns that are difficult to scale outside of a particular locality or place, and whilst they can often gain amplification through social media sharing channels that extend their reach, impact and impressions, 'reproduction' is often difficult due to the costs of replicating the experience of unique and place-based events.

How can this problem of scale be overcome? While immersive experiential advertising has traditionally taken place offline—at launch events, in stores, and on the streets—new spatial technologies have created a digital infrastructure that can place experiential marketing campaigns on our screens in ways that are potentially mechanically reproduceable.

Co-creational aspects of marketing as a co-production. In their seminal article, Vargo and Lusch (2004a) argue that marketing has moved from a goods-dominant view (characterized by the centrality of tangible outputs and discrete transactions) to a service-dominant (S-D) view, where intangibility, exchange processes and relationships are central (the basic characteristics of the S-D logic articulated by Vargo and Lusch are outlined in the following table:

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58 Lithium Media '*74 Percent of Digital Natives Tired of Brands Shouting at Them'* (2015) [Retrieved 3 Jan 2019]
59

Table 6: Service Dominant Logic Model: Cited in Warnaby (2009)

Table 1
Characteristics of the service-dominant logic and foundational premises

Distinguishing factors	Service-centred dominant logic characteristics/ Foundational premises (FPs)
Primary unit of exchange	People exchange to acquire benefits (e.g. knowledge and skills) accruing from specialized competences or services. Knowledge and skills are operant resources.
	FP 1 *Service is the fundamental basis of exchange* FP 2 *Indirect exchange masks the fundamental basis of exchange*
Role of goods	Physical goods are transmitters of operant resources; they are 'intermediate' products that are used by other operant resources (customers) as appliances in value-creation processes.
	FP 3 *Goods are a distribution mechanism for service provision* FP 4 *Operant resources are the fundamental source of competitive advantage* FP 5 *All economies are service economies*
Role of customer	Customer is a co-producer of service. Marketing is the process of doing things in interaction with the customer.
	FP 6 *The customer is always a co-creator of value*
Determination and meaning of value	Value is perceived and determined by the customer on the basis of 'value in use', resulting from the beneficial application of operant resources. Firms can only make 'value propositions'.
	FP 7 *The enterprise cannot deliver value, but only offer value propositions*
Firm–customer interaction	Customer is primarily an operant resource. Customers are active participants in relational exchanges and co-production.
	FP 8 *A service-centred view is inherently customer-oriented and relational* FP 9 *All social and economic actors are resource integrators* FP 10 *Value is always uniquely and phenomenologically determined by the beneficiary*
Source of economic growth	Wealth is obtained through the application and exchange of specialized knowledge and skills. It represents the right to the future use of operant resources.

Source: Adapted from Vargo and Lusch (2004a, 2008)

5.3.8 Games Engine Advertising

Games Engine Advertising offers advertisers the ability for content to be compiled based on contextual awareness of the user. For instance, IKEA's latest *'Ikea Place'* app customers can "try out" virtual furniture in their homes through placing them in rooms (or any public space) via their phone or tablet. "*It's unimaginable how different this is—that you can actually see the piece of furniture in your house before you buy it, that you can engage with items and interact,"* Shumaker says.[60] A recent example of this is a project by The Mill in London, that enables real time data to dynamically reconstruct a car at the 'user-end' in real-time[61].

[60] ibid

[61] Crecente, Brian, *The Mill Blackbird transforming car is the future of AR*, *(2017)* [Retrieved 3 Jan 2019]

5.3.9 The market for media content and mobility

Vehicle-based annual media consumption of all kinds is expected to grow to 95 billion hours by 2040. Deloitte's analysis has found that by 2030, vehicle-based passengers can be expected to consume more than 52 billion hours of media content annually, and passengers on public transportation could consume roughly 23 billion hours of additional media content. That's more than double today's estimated vehicle-based consumption (which occurs primarily through listening to the radio and passengers using their smartphones).

Commuters spend an average on £89 per week on their journeys to and from work[62]. This equates to roughly £28.2 Billion Contribution to the UK economy and indicates a need for services that can tap into the idea of transport and retail

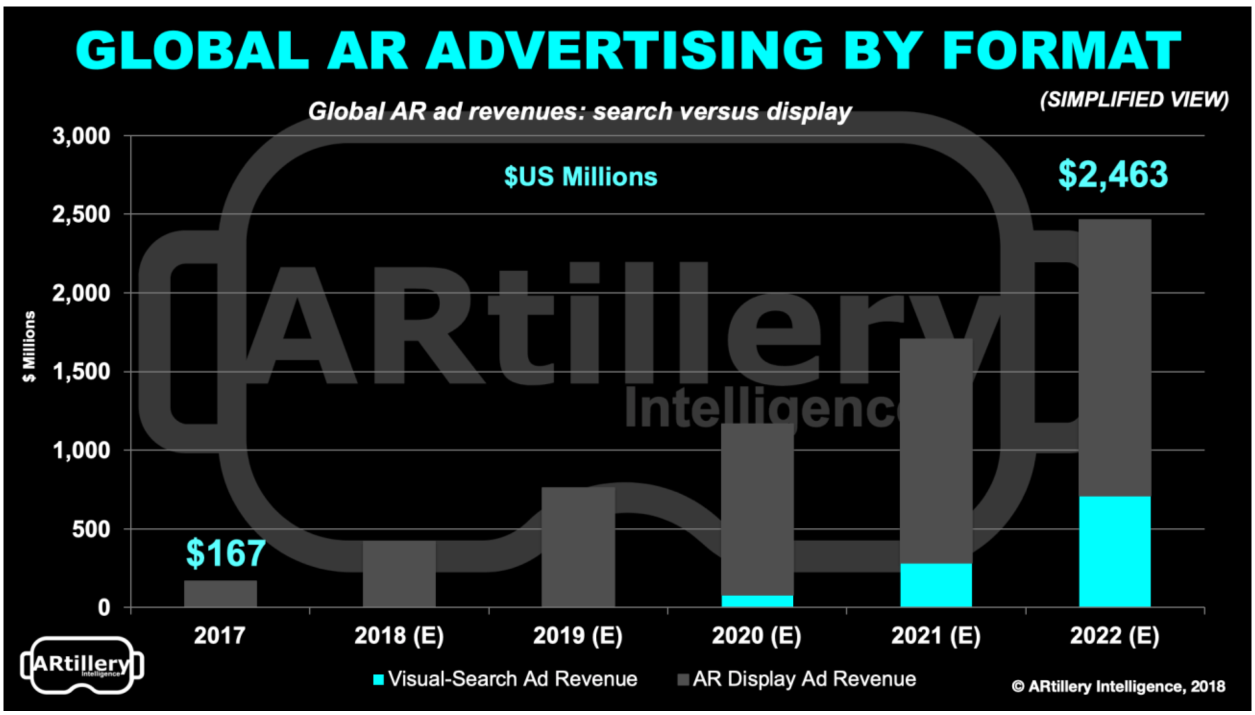

Figure 26: 'Global AR ad revenue by format' Artillery Intelligence, 2017

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62 Moyer, Sharon, *Commuters contribute £22.8bn to UK economy a year, report finds* Campaign Live, [Retrieved 4 Jan 2019]

6.0 End Users and Customers

The market between Ireland and the UK is mainly driven by visits to family and friends and long holidays. Key markets are young families and older couples visiting friends and relatives and holidaying, enjoying the outdoors and historical and heritage sites.

6.1 Demographic Trends

6.1.1- Ferry Market

From our own interviews and observations of ferry passengers between the UK and Ireland, the people varied in terms of occupations, including groups of students, workers going to Ireland for a month, people returning from an extended Christmas break, freight Drivers and people travelling for work. Generally people over 25 were travelling by car and people under were foot passengers.

6.1.2- Cruise Market

With over approximately 25 million people worldwide are expected to take a cruise in 2019, it is a growing market. Cruise operators are targeting target younger, family driven markets. Although traditionally thought of as an older persons holiday choice, there has been a sharp increase in the popularity of cruises for families in the UK. their passengers aged 46, (almost 10 years younger than it was 10 years ago)[63]. Their traditionally older market are still key to operations, however, who provide vital revenue throughout the year, whilst younger travellers restricted by school holidays.

In 2008, *Cruise Lines International Association (CLIA)* offered the following profile of the average cruise vacationer:

- Predominantly white/Caucasian (93%)
- Around 46 years old
- Well-educated, with 65% of college graduates, and 24% of post-graduates.
- 83% are married.
- 58% work full-time.
- Typically travel in pairs, usually with spouses or boyfriends/girlfriends (80%)
- 29% (2008) of people travelling with kids under 18 years old
- 25% travel with friends.

6.2 Age Groups

6.2.1 Millennials and Generation Z

[63] *Cruise Lines International Association's* (CLIA) latest industry profile,

Millennial Cruisers are an emergent global market, with 53% of American millennials expressing an interest in taking a cruise within the next two years—more than "Xers," "boomers," or "matures"[64]. They are also a highly desireable market to capture, representing a higher share of the premium market. 24% of millennials have traveled on a luxury line in the last three years versus of an overall average for that class of 10%.

"Generation Z is set to become the largest consumer generation by the year 2020-outpacing even Millennials. This generation like the one before, prefers experiences over material items and is seeking out travel. The appeal of multiple destinations and unique experiences, such as music festivals at sea, is attracting this new category of cruisers"[65]

Under 35's visiting the UK are likely to be most motivated by 'Having fun and laughter', 'Experiencing new things and 'Experiencing a wow factor' From our interview with *Cruise Liverpool*,[66] they shared that younger audiences most interested in the ship itself- or events such as music festivals on the ship, unlike 60+ age groups, who are interested in visiting new places and excursions. They also noted that millennials want to see and do things are more likely to want 'spectaluralisation'- the 'wow' factor, supporting a trend of experiential rather than physical purchases. UK visitors 16-34 year olds are more likely than other age groups to go to bars and nightclubs, go shopping and although also interested in heritage, they veer towards the 'top tenners' sites for visits.

Some cruise lines are trying new tactics to lure younger travelers looking for romance. For example, *Norwegian Epic*, a 4,100-capacity ship, features studio cabins priced for who also have access to the *Studio Lounge*, a place for singles to meet over drinks. Also, more likely to travel alone, packages offered by *SinglesCruise.com*, a cruise company catering to single passengers, hosts cruises based on different age groups part of an effort to target younger cruisers.

6.2.2 Family Markets

Published trends suggest domestic tourism across the UK and Ireland will benefit from the growing under 15 year old market. 42% of all holidays in Ireland, are taken by families with children under 15 years[67] This demographic is a key market as "*Families stay longer and spend more"* and are a valuable market to capture. From our own interviews with ferry passengers aged the 35-44, 85% of people interviewed had children and were using a ferry because of the ability to use their own car and how much cheaper this was for a family than flying. 35-54 year olds spend the highest amount of money cumulatively over a long visit, spending their money on good food, drink, visiting famous sites[68]

Although large numbers of UK and Ireland visits are for the purposes of visiting family, there is also a large holiday visitor market and a good mix of extended family/holiday time. The primary aim for family holiday makers is visit

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64 MMGY Global Research '*Portrait of American Travelers®- The most insightful survey of American travel intentions*', [Retrieved 10th Jan 2019]

65 Kennedy, Sarah, *'Gen Z at Sea' -2019 Cruise and Trends Industry Outlook 2019*, , Cruise Lines International Association (CLIA) *(*2018) [Retrieved 25th Jan 2019]

66 Interview with Kate Green, *Cruise Liverpool*, LJMU Maritime Centre, 25 Jan 2019

67 Horgan, Sheena, Failte Ireland *'Let's talk families WORKBOOK Why families matter and how to make the most of the family market"* 2018. [Retrieved 20th Dec 2019]

68 Ibid

rural areas where they can *'Enjoy the landscape*[69] and enjoy some ***'down-time' 'off the beaten track'*** away from crowded places[70]. Their overall aims are to *have fun and laughter* and return home with their batteries recharged[71]

6.2.3 Older Markets

Over 65 year olds are a considerable maritime market for both ferries and especially cruises, compared to other age groups. 6% of this age group partake in cruises (compared to only 1% of under 35s) More women than men travel by ferry in over 65 age groups[72] and most older travellers are likely to go on cruises as a couple. These visitors are most interested in 'heritage and history' and visiting beautiful coastal and countryside areas. They are least likely to go shopping although they do spend more overall on a variety of excursions and on food and drink.

Companies such as P&O Cruises targets older passengers, advertising heavily in The Daily Mail, *The Times*, *The Sunday Times* and *The Daily Telegraph*, appealing to over 60 demographic tourists. In order to appeal to this audience, they offer 4 'Music Festivals at Sea' in Europe billed as *Classic FM Music Cruises*, in association with the broadcaster, ranging from 14-17 nights.

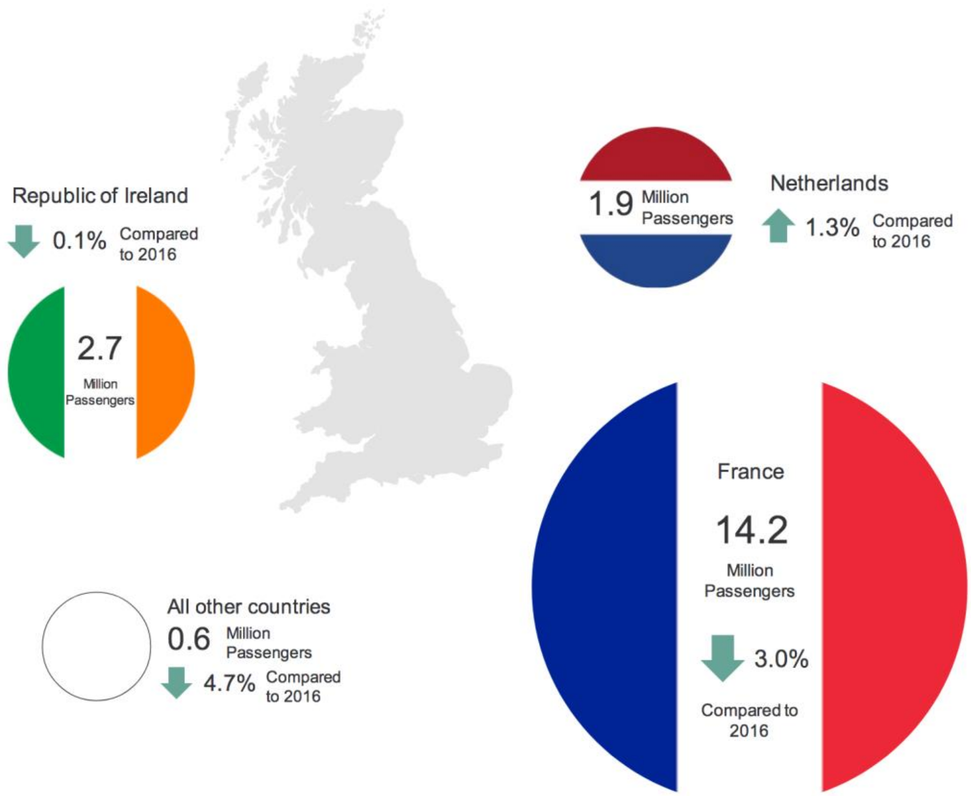

Figure 27: Nationalities of Maritime visitors to UK

[69] 'VisitBritain-Markets' Visit Britain Profiles [Retrieved 25th Jan 2019]
[70] Failte Ireland *'Great Escapers'* [Retrieved 9th Jan 2019]
[71] UK Department for Transport, '*Types of Transport used by visitors to Britain*', 2018. [Retrieved 20th Dec 2019]
[72] UK Department for Transport, '*Types of Transport used by visitors to Britain*', 2018. [Retrieved 20th Dec 2019]

6.3 Where do they come from and why?

The Irish Market

Visiting friends and family dominates the Irish tourism market. In 2017,the majority (31%) of entire visits to Ireland from the UK were to visit friends/relatives with most visitors having been born in Ireland. 27% of all visits were holiday related and 12% were for business. The UK is the biggest tourism market for the Republic of Ireland with the next biggest source market for Ireland being Mainland Europe, which accounts for 1% of entire visits to Ireland by sea. These include Baltic travellers, and those from France, Belgium and Netherlands.

The UK Market

France is the biggest market for maritime tourism for the UK with 14m visitors to the UK, mainly via Dover-Calais ferry routes and the channel tunnel. Ireland is the next most popular route via Dublin-Holyhead and with over 2.6m visitors. Other large markets include the Netherlands (1.9m), Belgium (Channel Tunnel) and Spain. Scandinavian visitors via Sweden and Denmark make up 0.03% of all maritime visits[73]

The UK market as a whole (including the ports of Dover and Southampton, welcomes over 14m French visitors every year. Ireland is the next largest (2.7m passengers in 2017). Visitors from the Netherlands are also in high volumes[74]. Unlike visitors to Ireland, the most popular reason for visiting (by sea) was to take holiday, often a repeat visit in a couple or as a group. Visiting family and friends is also a draw, however, depending on the country of origin. Largest ferry markets are France and the Netherlands with cruise markets having a wide range of visitors from the US, Germany and Japan. 'Heritage/history' is the most popular reason for visiting England followed by culture and 'to see world famous places'

Table 7: Preferences of Visitors to UK by sea* (not including channel tunnel)

	Ireland	France	Netherlands
Visitors in 2018	**667,944**	**674,281**	**542,783**
Age Range		**16-54**	
Primary Destination	**50%** England, **25%** London, **8%** Scotland **5%** Wales	**50%** London **35%** England **6%** Scotland **2%** Wales **1%** N.Ireland	**41%** London **43%** England **8%** Scotland **3%** Wales
Average Spend	**£403**	**£252**	**£332**
Average Stay	**4.2 Days**	**6.65 Days**	**6 Days**
Purpose of visit	**40%** Visiting Family & Friends **25%** Holiday **20%** Business	**45%** Holiday **30%** Visiting Family & Friends **18%** Business	**41%** On Holiday **28%** Business **25%** Visiting Family & Friends

[73] UK Department for Transport, '*Types of Transport used by visitors to Britain*', 2018. [Retrieved 20th Dec 2019]
[74] Ibid

		2% Study	**2%** Study
What They Like to Do..	• Sport • Pubs • Shopping	• Music • Museums • Sport • Shopping • Famous sites • Wildlife in Scotland	• Sightseeing • Pubs • Shopping
		The French want information provided **in their own language** They have a **slightly less positive view** of Britain- rating it highly for **contemporary culture**, **vibrant cities** and **sport**, **Music** and **museums, history and shopping** but less for welcome and scenic natural beauty food and drink Top activities are a **'visit to Buckingham Palace'** and **'spotting wildlife in the Scottish Highlands'**[75]	44% of holiday visitors visit the East of England Business visitors are more than three times as likely to be male than female. 8% are UK natives visiting home Over 75% are repeat visitors. Their favourite activities are sightseeing of famous buildings/ monuments, visiting a pub and shopping.[76]. Netherlands are generally younger, and second to the UK, the most receptive EU country to smartphone usage, AR and use of technology enabled experiences

6.4 Spending Power

From our interview with Alex Gibson, Head of Marketing and Augmented Reality Expert at *Dublin Institute of Technology*, it was noted that *"The demographics of people who use ferries and cruises needs to be taken into account. Whereas the 35m air passengers to Dublin Airport are some of the highest tier for advertisers (ABC1) maritime passengers are "often in lower socio-economic groups"*

6.4.1 Ferry Consumer Spend

The average spend for UK ferry visitors per visit is £403. The average length of stay is 4 days on average[77]. Average ticket prices for ferry (with car) between the UK and Ireland is £225 with *STENA line* selling the most expensive ticket between Belfast and P&O selling the cheapest ticket between Dublin and Holyhead. Given the price of a ticket, compared to cruises, and the price per person (based on a family of 4) being just over £50 return, we can conclude that price is a deciding factor for ferry passengers, and their willingness to spend on added extras on board may reflect this.

[75] Visit Britain Profiles *'VisitBritain-Markets-France'* [Retrieved 20th Dec 2019]

[76] Visit Britain Profiles *'VisitBritain-Markets-Netherlands'* [Retrieved 20th Dec 2019]

[77] Failte Ireland Research Unit, *Tourism Facts 2017* (2018) [Retrieved 20th Dec 2019]

6.4.2 Cruise Consumer Spend

In the UK Cruise passengers spent an estimated €431million on flights, port fees, accommodation, refreshments, excursions and other expenditure in the UK. Together, passengers and crew spent an estimated €559 million at ports-of-embarkation and call, accounting for 15% of total cruise industry expenditure in the UK.

The average spend of typical cruiser (worldwide, across all cruise lines) is $1,791 (£1382), spending 77% of their entire costs on their ticket ($1,293) and 27% onboard. Cruise ticket prices in the UK vary, as does the market, with budget tickets from £600 going upwards to £15,000 for luxury cruises. Cruise Liverpool said that their figures showed that a cruise passenger visiting the city contributed £73 per day to the city in direct spend of off

Interviews with Cruise Liverpool revealed that most cruise passengers have already paid for all-inclusive meals, drinks and excursions on board, and so their spend reflects this. Onboard Spending ($498) is divided between general expenses, 15% on the Casino & Bar $274 and 3% in the spa. Shore excursions only get 6% of spend[78]. And an example of passenger spend in the UK was £70[79]. An estimated €14.8 million was spent by crew at ports-of-embarkation and call, averaging €35 per passenger. In the UK, on average, passengers spent an average of €80 while in port and €180 at their port-of-embarkation[80].
Cruise Crew members also make up a great deal of on shore spending, enjoying shopping, bars and nightlife. The average spend in Liverpool was £50 per crew member, roughly 75% of a passenger spend.

6.5 Reasons for visiting:

From our own research of ferry passengers, Their reasons for travelling varied, with most not travelling regularly and needing their car as their destinations were outside cities, or that the ferry was less stressful and easier as a foot passenger. A few mentioned they didn't like flying. For some the flexibility of ferry travel made it appealing as an alternative to flying. A few mentioned that the ferry was more of an adventure for them.

6.6 UX Needs

User Data is showing that users are engaging in AR sessions in relatively short bursts of time (think: arm fatigue) [81]

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[78] Cruise Market Watch *'Financial Breakdown of Typical Cruiser'*

[79] Interview with Kate Green, *Cruise Liverpool*, LJMU Maritime Centre, 25 Jan 2019

[80] 'Consumer Research' Cruise Travel Report January 2018, CLIA,

[81] Boland, Mike, *'Drilling Down on 2019 Predictions: AR Ads Primed For Action'* AR Insider, (2019)

Table 8: Predictions of AR Advertising from AR Insider

Advertiser	App/Publisher	Campaign Dynamics	Results
Home Depot	Yahoo Mail	AR sequence launched from static email banner ad.	2+ minute average engagement time. 12.5 percent CTR to shopping page.
Kia	Facebook Messenger	Car visualization via AR overlay, launched from Kia's Facebook Messenger Bot.	46 percent boost in dealer inventory searches; 20 percent boost in phone calls.
Nike	Facebook Messenger	Kyrie 4 shoe release available exclusively through Facebook Messenger after users launched AR visualization feature.	Shoe sold out in less than an hour
Asus	Facebook Messenger	Customers "virtually unbox" latest ZenPhone 5 via AR visualization launched from Messenger.	Achieved 10x engagement compared to non-AR campaigns.
Foot Locker	Snapchat	The latest Jordan sneaker visualized through AR animations, launched from Snap Stories.	45-second average play time, 4 million impressions.
N/A	Houzz	In-home furniture visualization of a large portion of Houzz's online catalogue.	11x increase in purchase intent. 2.7x increase in time-in-app.
N/A	Snapchat	Branded Lenses, Shoppable AR and Ad to AR comprise its current range of paid AR offerings.	Overall 15 percent boost in purchase intent and a 9 percent boost in conversions from branded AR lenses.

Similar Data from *BBC Civilizations* App. This also correlates with our end user surveys that suggested that augmented reality sections of the app should be short bursts of around 20-30 seconds worth of content.

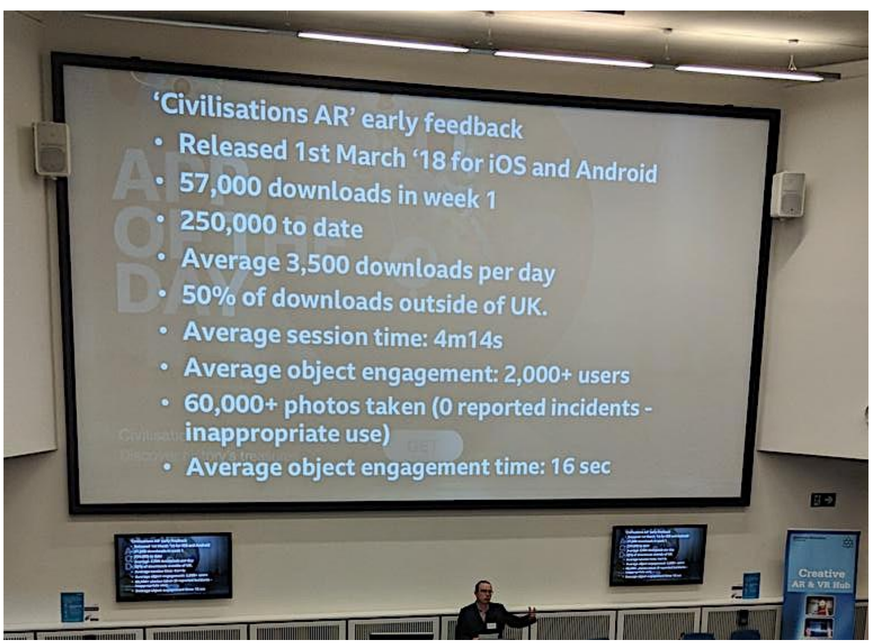

Figure 28: BBC speaker at LJMU Immersive Storytelling Experiences Symposium in Dec 2018

This corroborates research from 2018 from UKOM which showed that UK smartphone users spent an average of 6.5 minutes on their phone, in comparison to 13-26 minutes on a desktop or tablet device where they might watch longer form content[82].

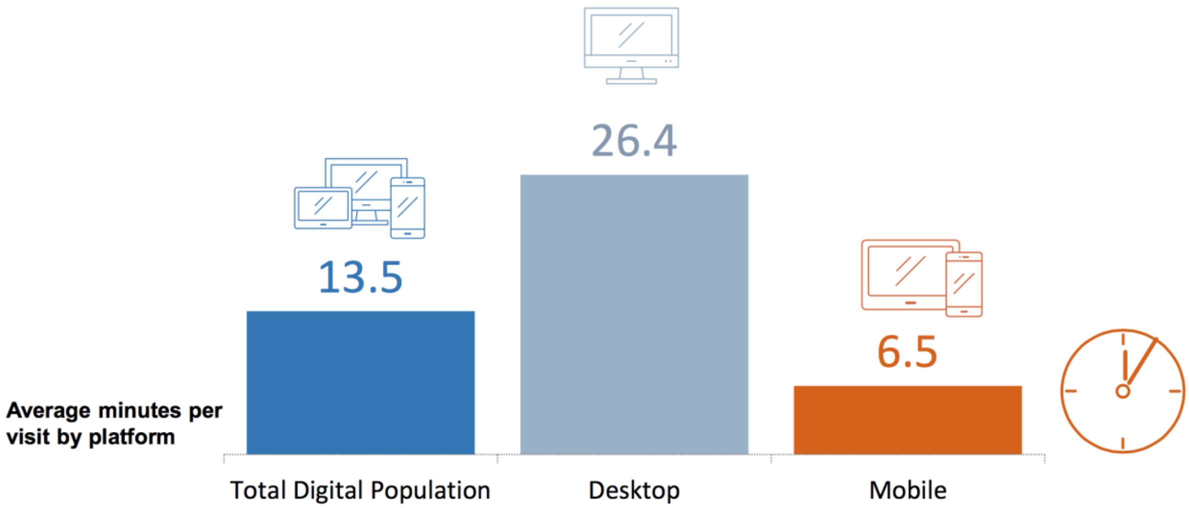

Figure 29: Time spent on different devices in the UK shows Desktop as longest and mobile with an average of 6.5 minutes.

6.6.2 Social Media and Internet Preferences

Smartphones account for 63% of all minutes spent online, with the UK being the largest 'Out of Home' audience in the European market[83]. 18-24s spend a much greater share of their time on smartphones than any other age group with 75% of their time online being on smartphones compared to 49% of 55+ audiences who use tablets and desktops. Main purposes of smartphones are as a communication tool , practical information, social media and news. Most popular apps are still Facebook (including WhatsApp and Instagram) with Snapchat and Twitter receiving half the market share[84]. Older users are users of social media but numbers are lower (50% had Facebook installed compared to a 70% figure for all adults)[85]

[82] UKOM, *Q3 2018 UK Digital Market Overview report*, (2018) [Retrieved Dec 29 2018]
[83] 'The Outdoor Media Landscape is Changing' Exterion Media, [Retrieved Dec 29 2018]
[84] UKOM, *Q3 2018 UK Digital Market Overview report*, (2018) [Retrieved Dec 29 2018]
[85] UKOM, *Q3 2018 UK Digital Market Overview report*, (2018) [Retrieved Dec 29 2018]

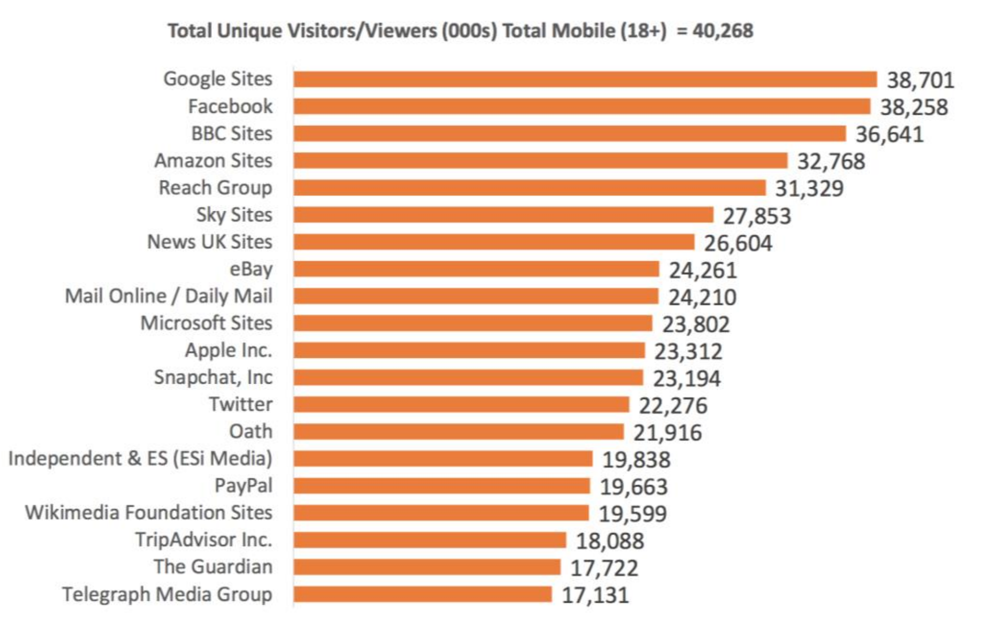

Figure 30: In the UK, Google sites (search, maps and YouTube) are most visited on mobile with Facebook a close second

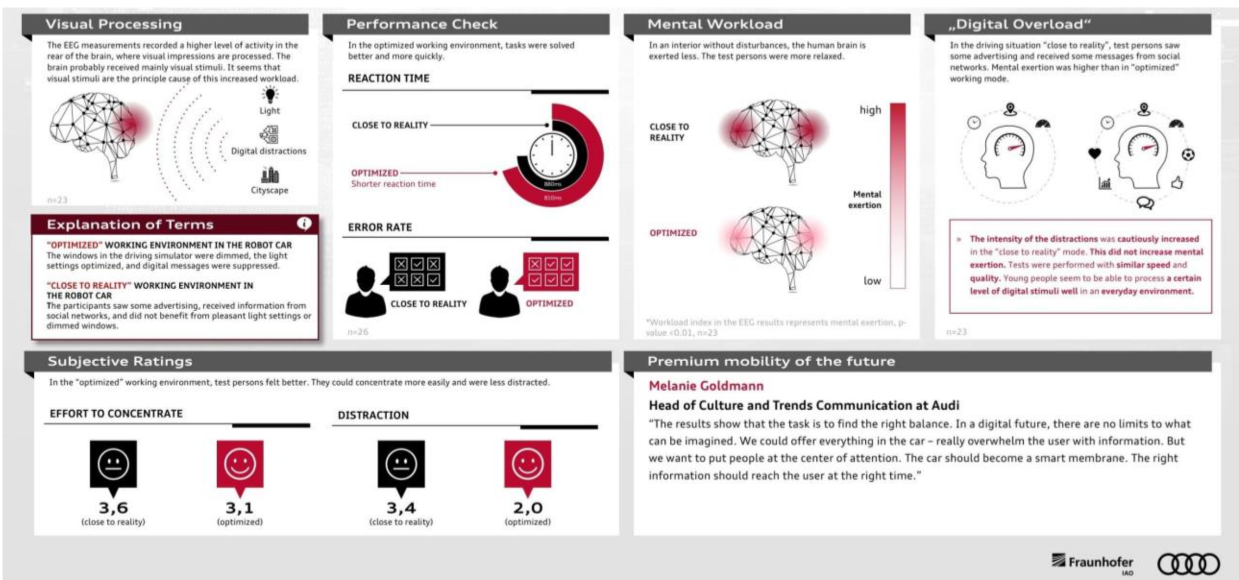

Figure 31: Audi have researched the optimal experience conditions needed to enjoy immersive experiences in cars

Car manufacturer, *Audi,* in collaboration with the *Franhoffer Institute,*[86] commissioned a study, *The 25th Hour* which explored passengers engagement with content in autonomous vehicles. From studies on test subjects, It was found that social media messaging was more mentally tiring than working, and advertising could rapidly switch from enjoyment into 'digital overload'. The study also categorised the time we spend in transit into 3 categories:

- Quality time- Activities with their children or telephoning family and friends.
- Productive time - Usually work.
- Down time- Relaxation, usually by reading, surfing the Internet, or watching a film.

[86] Audi Media Centre '*[Audi is researching the use of time in the robot car](#)*' (2017) [Retrieved 28th Jan 2019)

The potential is great for Immersive storytelling to harness *Quality time*, by providing more interactive, family experiences and *Down Time* which allows journeys to be enjoyable.

The relationship between stimuli, environment and the state of mind of the user are not new concepts. In *Advertising Principles and Practise 2006*, these 3 factors are broken down into key characteristics (below):

Table 9: Psychological Factors for Users

Motivation ● **Maslow's hierarchy** ● **Settle and Alreck's horizontal needs include achievement, independence, exhibition, recognition, dominance, affiliation, nurturance, succorance, sexuality, stimulation, diversion, novelty, understanding, consistency, and security (Settle and Alreck 1989).**
Perception Consumer Consumer ● **According to Wells, Burnett, and Moriarty (2003), perceptions are shaped by three influences: (1) the physical characteristics of the stimuli, (2) the relationships of the stimuli to their surroundings, and (3) the person's state of mind (p. 107). Because perception is influenced by a person's state of mind, perception is essentially a personal trait.**
Learning decision-making response & Attitude ● **The individual's behaviour is influenced both by his or her own perspectives, along with those of his or her referents, such as family and friends, which ultimately dictates the exhibited behaviour (Ajzen and Fishbein 1980, Schiffman and Kanuk 2004).**

6.7 Content Needs

From our interviews and demonstrations of AR with different passengers on two major ferry routes in the UK and Ireland, we found that:

6.7.1 Learning Something New

Family markets had a strong interest in the educational value of themselves and their children ‘learning something new’; “*Could be cool, especially for kids and younger people and discovery of interesting facts, Would pass the time and could learn about the sea (science, biology, plastics in the ocean)”* There is clearly a demanding significance of the sea and learning about the oceans. The oceans and immersive technology, *National Geographic Ocean Oddysey* is a location-based experience (LBE) in art galleries[87] *Fishes: Greater Caribbean*[88]**,** a tool from the *Smithsonian Tropical Research Institute*, allows passengers to ‘unlock secrets about more than 1,600 species of fish, like those that can be found on scuba diving excursions during a cruise. Considering heritage and history dominate UK and Ireland visits so heavily,[89] *The potential to learn about the sea and history[90]”* and heritage are also key drivers for content.

87 Filmmaker Magazine, Interactive Video in a Gallery Experience: Lisa Truitt on National Geographic Encounter: Ocean Odyssey

88 Smithsonian Institute, *Shorefishes of the Greater Caribbean online information system*,

89 Visit Britain, *‘2017 Snapshot’* (2018) [Retrieved 11 Jan 2019]

90 Ferry passenger Interviews , P&O Liverpool-Dublin Ferry, Jan 14 2019

6.7.2 Getting Practical Information

Based on our surveys, adults reported that getting practical information about their journey and destination was important. Children were indifferent, and were much more interested in the experience, the storyworld and the ability for the boat to be transformed into an adventure/game.

6.7.3 Making connections

A number of our focus group interviewees reported that ' It would be good if it could help kids mix with other kids, it would give me a break from trying to entertain them.' suggesting that there is value in considering shared experiences in our service. This also includes being able to actively engage in shared family experiences through a single device, or multiple devices. A number of users reported that their interest in Pokémon go was because it created a shared social experience, and something that they could do together with users.

6.7.4 Forms of Content

"doesn't necessarily have to be AR- short videos/photos/text all would help"

- *Were interested in it being about moving around the boat to make you feel less sick as got something to focus on*
- *Pass time/educational*
- *It's interesting, not sure I'd use it though, but something that gave me gps based information about the Irish sea would be good,*
- *If I could learn something that would interest me*
- *Kids really liked it and said they would use it. Parents said it could keep them busy.*
- *Kills time, especially if it was interactive*
- *Definitely for kids, they would like it.Fantastic would rather do this than just drinking. Kill time*
- *Would use with children (13 yo), travelling is difficult with kids, there's nothing to do*
- *Not something I'd engage with, apart from maps, I try to use the journey to avoid screen time*
-
- *Looks cool, would be good for younger people especially if it had fun things, fun facts*

6.8 Technology Needs

Every respondent to our survey, including the children, owned a smart-phone.
22 of the 26 adults owned a laptop. Other devices reported by the adults included tablets, kindle, I-pad, PS4, Amazon Echo. The children also reported access to all of these devices, and 10 of the 26 children said they had access to a laptop. All the others had access to a PC or Mac. All the children had smartphones: 16 had I-phones and the others were androids.

But the children seemed to have far more devices that the adults. Of these some were non-portable such as x-boxes and PS4's but 10 of the 26 had access to portable devices such as switches, 16 had 3DS, (although hardly any used it anymore) and 20 had access to I-pads or some sort of tablet. 6 children reported access to kindles.
The conclusion is that people take at least a smartphone with them, but most have laptops and tablets as well, and children have a further number of portable devices they take when they travel.

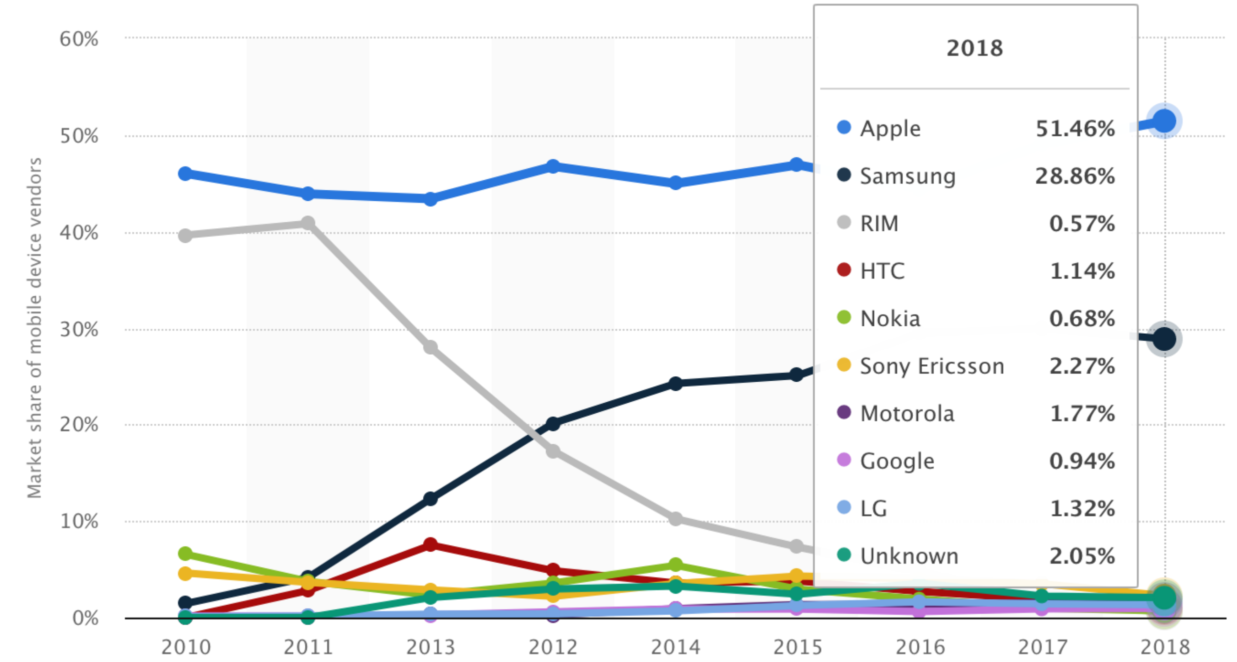

Figure 32: Leading mobile device vendors in the United Kingdom (UK) from 2010 to 2018

The most popular UK smartphone is clearly the Apple *iPhone*, taking 51.5% of all sales in 2018[91] and the iPhone 7 being the most popular model with 13%. The AR enabled iPhone X has just over 4% of the market. The *Samsung Galaxy* is the next most popular choice, with 29% of the market across S7 and S8 models[92]. The Republic of Ireland has a similar profile, except for the inclusion of another leading model, *The Google Nexus*[93], perhaps due to the presence of the tech giant in the country.

91 *Market share of leading mobile device vendors in the United Kingdom (UK) from 2010 to 2018*

92 Device Atlas, '*Most Popular Smartphones- UK'* [Retrieved 27 Jan 2019]

93 Device Atlas, *Most Popular Smartphones- Ireland,* [Retrieved 27 Jan 2019]

7.0 Focus Groups and Interview Analyses

7.1 Ferry Passenger Focus Interviews

We held focus interviews on ships with potential users on two ferry services (*P&O* Liv-Dub and *Stena Line* Bel-Bir), interviewing a total of 19 people including groups, families, commuters and a range of ages and showing them a little taster of what a part of the experience might look like. Using a semi-structured interview approach.

These interviews were conducted randomly during the middle 6 hours of the journey and some were conducted in groups.

Ages:
Under 12 ---- 3
12-17 --- (School Days)
18-24 --- 4
25-34 --- 2
35-44 ---- 7
45-54 --- 2
55-64 --- 1
65+ ---- 0

7.1.2 How did they Feel?

We asked about their general emotional state and generally people were ok, a bit bored, calm and a few feeling a bit seasick).

There was a general consensus that onboard entertainment was quite limiting, and that after the first hour or so it got very boring, up until the expectation of arriving that started about an hour before the journey. It is important to note that generally people would find a fixed part of the ship to base themselves (usually by a window), and claim that as their territory for the whole journey.
On departure and arrival people did go outside to see their arrival and departure destination, there is a bit of excitement about these parts of the journey.

7.1.3 Smartphone Usage

In terms of phones they mainly had smart phones, and mostly within 2-3 years old and high spec (iPhone, Samsung's), with older audiences also having tablets and laptops.

7.1.4 Frustrations with Travel by Ferry

When asked about their frustrations with travelling via ferry, we had the following comments:

- *There's not much to do, just waiting for time to pass is a pain*
- *Time and connections with getting to ports, not much to do apart from watching the news*

- *Time it takes, they don't seem to care about customer experience, especially for foot passengers who are treated like 2nd rate citizens*
- *Bit boring*
- *Can't always get Wi-Fi*
- *Am used to travelling so its ok*
- *Bored*
- *The kids just use my phone, we potter around doe a bit, I guess it's nice to be together though*
- *Keeping kids entertained, feels like a wasted day*
- *Thinking of ways to pass the time, after a few hours its dull*
- *Bored and feeling seasick*
- *Too long*
- *Its ok*

7.1.5 What would you like to do onboard?

When asked about what they would like on board, we had the following:

- *Bingo, activities, people to do things with the kids*
- *Pool snooker, better Wi-Fi, more information about the route*
- *Waiting around and being held up in port is a pain*
- *More activities - cabaret, games. My kids (8+16) would just spend all the time on their phones*
- *Wi-Fi- more choice in films*
- *More choice in things to watch, the films don't always appeal to me*
- *Free PlayStation*
- *Things to do together as a family*
- *Free games for kids, something where they could learn*
- *More kids things, better internet*
- *I'm happy with what there is*
- *Something to distract me and pass time quicker, things to do together*
- *Board games on board*

When asked about how they find out about where they were travelling, most reported googling as their first option. These were generally what might be described as TOP TENNERS.

All, apart from 1 person (an academic!!) said that they would be more than happy to have an app to help them pass the time, and that they would probably use it. Especially those with Children.

7.1.6 Perceptions of AR

We showed them a quick demo of an AR Whale jumping out of the sea and their responses about it, and its benefits were:

- *It could be really entertaining, not seen that type of thing before. It would be good to try as it looks interactive and would be a great distraction to fill the time*
- *Would be good if it could help kids mix with other kids, it would give me a break from trying to entertain them.*

- *Really exciting, visual and would suit kids. I would love it and it might teach him something. Maybe it would keep him still for a bit and husband would find out stuff*
- *It's interesting, not sure I'd use it though, but something that gave me gps based information about the Irish sea would be good, doesn't necessarily have to be AR- short videos/photos/text all would help*
- *If I could learn something that would interest me*
- *Could be cool, especially for kids and younger people and discovery of interesting facts, Would pass the time and could learn about the sea (science, biology, plastics in the ocean)*
- *Kids really liked it and said they would use it. Parents said it could keep them busy. Were interested in it being about moving around the boat to make you feel less sick as got something to focus on*
- *Pass time/educational*
- *Kills time, especially if it was interactive*
- *Definitely for kids, they would like it.Fantastic would rather do this than just drinking. Kill time*
- *Would use with children (13 yo), travelling is difficult with kids, there's nothing to do*
- *Not something I'd engage with, apart from maps, I try to use the journey to avoid screen time*
- *It's interesting, could learn about the sea and history. Dad mentioned information would be of interest (heritage/history)*
- *Looks cool, would be good for younger people especially if it had fun things, fun facts*
- *It's interesting, I think that people might use it to pass the time. My kids just spend all their time on phones and its better if they are more engaged with the environment or learning*
- *I do this journey a lot and it would interest me*

7.1.7 Content and Features

When asked about content and features, people mentioned the following:

- *Good if you could learn stuff about the destination*
- *Good to learn about the sea, animals and boats*
- *If there was a way to see route information, like on a plane, then that might be good. Could also show you things about where you are going*
- *Would be interesting to learn the local history of this route*
- *For regular travellers it would be good if it was different every time*
- *Learning about sea animals would interest me-- educational*
- *Could see shipwrecks and educational content*
- *General knowledge would interest me, I like facts.*
- *Could it have data about journey*
- *Anything that keeps other people's kids quiet is good for me*
- *More likely to use it in a group than travelling on my own, it's probably mainly going to appeal to people doing it together.*
- *Would be good to find things out about the journey*
- *Would need to think about where people are using it, as not all areas of the ship and windows are easy to get to. Also wouldn't there be too much running around and danger. Can see it working on cruises more.*
- *Could use it to give messages to people at certain parts of the journey, such as messages from crew or special offers.*
- *Educational content for kids, we try and get them away from screens though, destination related content would be good and maybe special offers from the onboard shops and restaurants*
- *Local stories, history, science all interest me*
- *Funny stories, stuff to have a laugh*

- *Fun facts and mixture of different things, maybe games if in groups-- giant rainbows and leprechauns over Dublin*
- *Stuff about Liverpool and things to do*
- *Snippets and also chance to delve deeper if the content interests me-- such as videos. We spend the journey planning what we are doing, so something that helped with that. So would need to work there.*
- *Could you collect things along the way.*
- *Shipwrecks, pirates coming to get you, doesn't just have to be about local area, as long as it was interesting and created excitement*
- *Treasure hunts and trails on boat, collecting things along the way, interaction with other kids so that they entertain themselves*
- *Local history, upcoming events, not too bothered about fiction-- but like fiction if it is based off the truth*
- *Old ruins and sea things*
- *Famous things on the route, animals, education and sponsored experiences*
- *Would be good if it was triggered by route, knew where you were*
- *Games and mini games for kids*
- *Things to do together*
- *Sea life and history of sea*
- *Entertaining content and stories*
- *Could have competitive elements, finding out things you didn't know and getting treasure*
- *Could link in with other creative content that's already been made for other purposes, but generally I'd be interested in anything that was educational*
- *Treasure hunts on the ship, being able to see where you are in the middle of the ocean- pinpoint cities and compass*
- *Interactive games, stories and characters at sea. Learning and educational things.*
- *Finding out about things to do at the destination, fun things happening*
- *Tourism stuff*
- *Stories about Ireland and the sea, true and fiction-- like documentaries and factual things*
- *Animals is sea, educational. Needs to be better than the films onboard*
- *I'm a cycling enthusiast, and there are lots of cyclists that use ferries could it appeal to them*
- *Details on journey, nautical information. I generally will stay in my cabin for the journey*

7.1.8 Online Surveys and Further Focus Groups

This interim report is taken from the online survey supplemented by a series of interviews with children in groups of 1, 2 and 3. The online survey will continue to be open to participants and later comments will be added. 26 people responded to the online survey and 26 children of the ages of 12-16 were interviewed. The findings from the adults were often different from the children, so I have usually separated out responses into the two diverse groups. Respondents came largely from the NW of England (all the children came from Manchester) but there were also respondents from Holland (1) Germany (1) Canada (1) Sweden (1) and US (3). The work situation of the adults was fairly broad with no overall emphasis on any sector. There were a few in education, as teachers and students, as well as administrators, retailers, manual workers and professionals.

Report Analysis

Q1: Please indicate how you identify yourself

The demographic of adult respondents was:

- Female: 61.54%
- Male 23.08%
- Other 15.38%

For the children it was:

- Female: 23.08%
- Male: 76.92%

Q2. What age range are you?

The approximate percentage of age-ranges of respondents was:

- 12-17 years: 50%
- 18-24: 14%
- 25-34: 4%
- 35-44: 4%
- 45-54: 14%
- 55-64: 14%

Q4: What are your hobbies and interests?

Interests and hobbies were diverse, with an emphasis on cultural and gentle sports such as running, walking, yoga for the adults. For the children, the sporting activities were more active. Music, performing, crafts and cinema came up with both adults and children, and gaming and coding, and other online/technological pursuits were popular with the younger groups.

Q6: If you travel, why are you travelling, for work, pleasure, to meet family etc.

The responses here largely showed that the majority of trips are taken to meet family/friends, or for holidays and pleasure, rather than for work. The breakdown was that only about 30% of adults said they travel for the purposes of work, whereas all respondents including children mentioned either holidays/pleasure or family/friend events:

Q7: What forms of travel do you like?

Adults:
Over ninety percent of adults said they like to use car travel, with plane travel being a close second. Train and boat were also popular with adults. Given that boat is a more difficult form of travel to take for those not near the coast, or a large river, it was encouraging for us that over 50% of adults said they like boat travel.
The adult response percentages were:

- By Car 92.31%
- By Coach 23.08%
- By Motorbike 0.00%
- By Plane 84.62%
- By Train 69.23%
- By Boat 53.85%
- Other 7.69%

Children:

For children the responses were rather different. Children expressed a profound dislike of car travel which they find restrictive and boring, as well as making them feel unwell. They prefer plane travel which even though they are strapped in for much of the time they find less boring, perhaps because they have more access to parental input, or just because the space inside a plane is more of a treat, and almost always associated with holidays. They also quite like train travel. However, the surprise was that they reported that their favourite form of travel was by boat, even though, or perhaps because, they had been on a boat less times than they had used other forms of transport.
The children's responses were:

- By Car 14%
- By Coach 14%
- By Motorbike 0.00%
- By Plane 84.62%
- By Train 69.23%
- By Boat 92.31%

Q8: What would make you choose one form of travel over another?

Adults:
The adult respondents usually requested logistical predicators such as convenience, ease of travel, cost, length of time to achieve journey, luggage capabilities, and accessibility of travel options to their chosen destination, reliability. Preference was also related to the experience of travel itself, such as comfort, entertainment on board, safety. The children were mostly motivated by what the experience of travel had to offer, such as the ability to explore, move about, not being kept waiting in a 'boring' place, plus entertainment opportunities, which meant having good Wi-Fi and the opportunities to charge up devices.
The responses in detail included:

- Depends on what - work it's about convenience and getting there on time. Pleasure I might choose to travel more slowly
- Activities on board
- Depends on time and cost. Would prefer train journeys over flights but often more expensive or impractical. Prefer channel tunnel over ferries for time.
- Convenience.
- Overall experience e.g., cruising. Safety. Ability to manage luggage conveniently
- Price
- Cost
- Ease and comfort of journey
- In the United States, those are really the only two options. At least where I live.
- the weather and how much money I have to spend
- Ease
- Price, and speed
- Reliability Cost of travel Comfort
- Speed Accessibility to destination
- Convenience
- Comfortable seating,
- Fast, cheap, good entertainment options

- Nice views

Children:

From the discussions with the children it was clear that boat travel was vastly preferable to car travel, which they felt was boring, restrictive, tiring, with being strapped in in tight places for too long, and possible car sickness. For the children, the holiday starts when you get out of the airport at your destination (assuming you don't have another long time strapped into a car.) But boat travel is part of the holiday for them, they don't see it as part of the journey but part of the fun. Those who had experienced ferry travel said they liked to roam about the ship, watch the sea, be in the 'outside' rather than inside, and were excited by the idea of an app in which they could be active and explore the boat through the app. Those who had never been on a ferry expressed a strong desire to experience it.
The comments from the children were as follows:

- Things to do, if there's fun stuff
- If it's not boring, as long as there is Wi-Fi.
- Don't like it to take too long, because that gets boring.
- Things to see and do, which you can't do at home.
- Not being stuck in one place.
- Being able to see things.
- Nice food and drink.
- Seeing things on the journey, like the sea, and the coast and the ports.
- Doing things not sitting down.

Q11: What products/apps/services do you use on a regular basis?

Adults:

- **Adults reported using a wide range of apps:**
    - WhatsApp and other messaging apps, email, skype, WeChat etc.: 20
    - Travel apps (Google maps/Waze/Rome2Rio): 10
    - Social media (Facebook/Tumblr/twitter): 20
    - Language/travel culture apps (duo lingo): 6
    - Professional: (LinkedIn, banking apps, lastpass, duo mobile): 10
    - Travel logistics (Trainline, Steps) 4
    - Entertainment (Youtube, podcasts, BBC iplayer, discord, Starwalk, Nettflix) 12
    - Music (spotify, Jazz24,) 4
    - Photos (Pinterest, snapchat, Shazam) 10
    - Retail (Amazon, Etsy, Quidco) 6
    - News (BBC, Reuters) 4
    - Other (Life360 to track kids, bibleapp) 2

Children:

- Snapchat (20)
- Messaging (26)
- Whatsapp (22)
- Youtube (12)
- Instagram (14)
- Spotify (24)

- Fortnite, (10)
- Nettflix, (6)
- Reddit, (6)
- Discord (4)
- …Plus a whole array of different games that they have only just downloaded but say they will erase tomorrow

Q12: When you are travelling (on a train/bus/ferry/plane) what do you do to pass the time?

Adults:
Adults reported they would:

- Play on phone, answer emails, for work I write on laptop
- Listen to music Play games
- Stare out of the window. Think. Read books or news on iPhone. Chat to strangers. Watch in-flight entertainment
- Read Talk Sleep Eat/drink Look at the scenery. Daydream
- read
- Read kindle Surf net on phone
- If I'm not driving, I read. If I am driving, I listen to audiobook and music
- Read Chat Social media
- Read and listen to music
- sleep, music, write, watching movies, read
- Sleep Read Eat
- Reading
- Read a book, watch something I've previously downloaded to the Netflix app, look out of the window, catch up on emails and messages.

Children:

Children reported they would:

- Watch things on phone
- Read
- Play games on phone/portable consoles
- Draw
- Colour in
- Read something bought in the airport shop
- Listen to music
- Sleep
- Make up quizzes with each other
- Watch films
- Youtube
- Memes
- Chat with friends
- Text people
- Social media

Q13: What games/entertainment, if any, do you play or watch whilst travelling?

Adults:
About half the adults reported they would do non-technological things, like read, play cards or word games with the family or scrabble, or do crosswords/Sudoku. They also reported overwhelmingly that they would do digital/technological activities too, such as google things and go on YouTube, listen to audible or watch films on Beam or Netflix.
Their responses included:

- YouTube
- Google things and follow the links
- Pokémon
- With family play cards
- Word games with family.
- Google random things to read about
- DS
- None
- YouTube music and audible audiobook
- Audible
- Scrabble
- Plane movies, music, books
- Crosswords Sudoku
- Books
- Netflix
- Virgin Beam app

Children:
Children have a vast array of different games which they play, with the digital being most popular by far. A few still play DS games, such as Pokémon, and Mariocart, but mostly now they play games on phones and handheld portable consoles like Switch. Fortnite is still popular, although on the wane apparently, and they love to share funny memes, and whatever bit of comedy content is currently trending. You tubers like Pewdiepie are popular with almost all the children.

Q14: How do you find out about things to do in the destination you are travelling to?

The children seem completely uninterested to find out about the destination and said they wouldn't bother. Adults reported that they might use physical guide books and leaflets, or newspaper information, but also many just said they would google. They might also use social media, word of mouth or a Tourist information centre.
The adults reported that they would spend time:

- Googling, friends, guides I find whilst travelling, tourist information office when I am there
- Google
- Internet research. Guardian/telegraph travel, travel blogs, Instagram, friends, TripAdvisor but with pinch of salt,

- Always buy a guidebook. Google. Ask a local
- People I know
- Internet Travel book Word of mouth Brochures / leaflets in destination e.g. tourist office
- The welcome center, and the website for the city since I plan ahead
- I google the destination
- Internet searching
- Internet
- Google Sometimes use Tourist Information Centres
- Internet
- Google, ask friends, trip advisor

Q15: If you interested in finding out more about your destination, how would like to be able to access this information?

Apart from one adult, who didn't understand the question, every adult and every child expressed a desire to have such information accessible on their phone, via the internet or an app. Responses included:

- On my phone
- Google
- Quickly. Easily. Via internet
- An app would be most convenient.
- Online blogs and websites
- Online website
- I would like to access it on my phone
- I have no idea what this is in relation to
- On my phone
- Internet
- Easily through an app

Q16: What are your main frustrations when travelling?

Many of the frustrations for adults were not solvable in terms of our remit, such as comfort of travel, delays, bad weather, dealing with luggage etc. However, in digital terms, the lack of Wi-Fi or poor Wi-Fi, or its cost was an issue, as was the availability of charging stations. It might be possible to mitigate against some of their other frustrations such as delays, by using digital apps to update passengers on delays and weather; also, it might be possible to alleviate frustrations such as lack of seats, by providing information about empty seats on an app?
Adults:
Adults reported their frustrations as:

- Lack of Wi-Fi
- Long journey
- Flight delays. Never enough time.
- Traffic Delays
- Dealing with luggage

- Bad weather
- Lots of changes on train
- Not getting a seat
- Noisy passengers
- It's expensive because of gas price
- How long it takes to get there
- I don't like driving
- Delays especially when not explained
- Space when sitting, being comfortable
- The time it takes
- Overcrowding
- Inability to regulate the temperature
- Not enough leg room
- Poor access to charging facilities
- Quality and cost of Wi-Fi
- Stopping
- Uncomfortable seats, expensive Wi-Fi, boredom

Children:
Children’s frustrations appear to be more able to be moderated by a digital fix, or at least something we can address. They reported their frustrations as:

- Not exciting
- Uncomfortable
- Being stuck and strapped in
- Takes a long time
- Can’t charge devices
- Wi-Fi doesn’t work, not enough charging points, difficulty getting nice food.
- Not enough toilets or not near one.
- Plane restrictions.
- Being bored.

Q17: How do you think digital technologies could help to manage these frustrations?

Adults:
Adults when asked were generally able to come up with a number of ways that digital technologies could enhance their journeys, even if they didn’t exactly match their frustrations given above. One respondent wrote ‘change journey from functional to magical’ which is something we could use in persuading stakeholders?
Their comments included:

- make Wi-Fi work
- Entertainment
- More communication from airlines about delays and expectations

- Plan your itinerary - offer suggestions of places to see/ activities Say what delays are ahead Give you another route / way to avoid or fill the time.
- Changes nature of journey from functional to magical. Entertain children Reduce boredom/ irritation. Improve mood
- An app that compares nearby gas station prices could be useful
- It's fun to listen to a novel on audible
- Provide automatic updates
- they couldn't, not really
- Live updates on scheduling changes and options
- Provide distraction content that allows me to educate myself

Children:

Children's expectations of digital technologies were quite practical. They wanted more entertainment options, with better and stronger Wi-Fi that covers the whole of the ferry so no blind spots, and so it doesn't cut out in certain areas. They too wanted more charging stations. Generally, the children were inspired by the idea of a storyworld within a ship and their imaginations began to run riot about how much fun this would be.

Q18: We're designing an app to make ferry and cruise journeys more exciting, because often people are travelling for many hours with limited onboard entertainment. What would make such a service appeal to you?

Some adults reported that they would be attracted to such a service if it was free, and several requested ease of use and that it downloaded quickly and worked well. A couple of respondents requested that the app didn't take up space on the phone. This is an issue for discussion. One commented that previous ferry travel had been very unsatisfactory, so there is obviously a need here. History and films were popular as entertainment.
Some adult answers were:

- exciting, easy to use, uploaded quickly and easily and wasn't clunky
- Free
- Immersive entertainment/stories about the area or destination. Or information on destination that would useful or interesting about the destination.
- Ease of use. Surprise. Size of spectacle. Include stories around some of the history of the destination
- on boat cinema
- N/a The last cruise I went on was unfavorable - the entertainment options were cultivated debauchery
- To pass the time in an entertaining way. Good movies
- Give historical and geographical insight into the area being travelled through
- the fact that I wouldn't need an extra app to do it -- a way to access the information that wouldn't need to take space on my phone
- It would have to be quick to load and easy to use Needs to be visually stimulating Information needs to be clear and concise Simple links
- Cost
- An innovative and unique entertainment that would be exclusive to that particular journey. High-quality AR graphics that enhance views together with interesting information and historical details about the places seen and traveled to.

Children:

Children were unequivocal about the cost. It HAS to be free, they said. And if it *has* to be paid for by the user, it must be a one-off fee. That seemed really important to them, because they all seemed to hate the idea of paid subscriptions.

Ease of download isn't an issue for children though, and in fact they suggested that if it was too quick to download, it wouldn't be good enough entertainment for them, because they know if it's too easy it won't have much replayability. This is something to discuss, being at odds with the adult requests.

The children were also clear that for them, it would be much better if it had a story. Their queries were not about how long it would take to download (which they suggested should take place before the journey, so as not to waste the time when they could be exploring the ship inside a storyworld,) but 'How long will the story take?' A playable story which has multi-strands or levels so you can play it again is what they wanted.
They didn't want the scenes, or events to be too long, in fact they suggested scenes/events should be no longer than 20 seconds.

They thought it might be good if you could choose your own adventure, which starts when you join the ferry, and then there are bits to do all over the ferry, in a random order, and you choose and it doesn't matter if you miss bits out. And then when you leave the ferry, the first chapter ends. But you know that you can come back and do another chapter somehow. They were very keen on replayability. And on having control of the order of events/scenes. That way they could play through 'chapter 1' again, and it would still be fun, because it was now in a different order. Or there was the chance that they hadn't done everything in the first chapter or leg of the journey. that would work too.

A couple of children suggested that it would be even better if it carried on in the destination somehow. Something to discuss?

Q19: What sort of content would you like to see and hear in our app?

This question opened up the divisions between the children and the adults. Adults were more prone to ask for information about the destination and culture, although they also wanted entertainment. The children wanted entertainment primarily. The children were clear that they didn't want 'information' on its own, but they were happy if information was presented hidden inside parts of the game/story. They want an experience with a story and games which are about the environment and history for example. And they all seemed to love the idea of 'earning' vouchers and discounts in the ferry/terminal shops.

Adults:

Adults wanted content about:

· History of the local area	69.23%
· Information about the destination	84.62%
· Where to stay	30.77%
· Where to eat	61.54%
· What to see	84.62%

- Cultural information 92.31%
- Environmental information 69.23%
- Entertainment content 46.15%
- Games 15.38%
- Special offers 38.46%
- Vouchers 46.15%
- Discounts 38.46%
- Something else 0.00%

Children:

Whereas children wanted:

- History of the local area 14%
- Information about the destination 7%
- Where to stay 0%
- Where to eat 0%
- What to see 0%
- Cultural information 38.46%
- Environmental information 30.77%
- Entertainment content 100%
- Games 92.31%
- Special offers 84.62%
- Vouchers 84.62%
- Discounts 84.62%
- Something else 92.31%

The something else they all wanted seemed to be 'a good story', with 'replayability'. 'You don't want it to just end with nothing you want to go back and redo.'

Q20: Given the opportunity would you be happy to use this type of application on a ferry journey to see things happening out at sea?

Adults all said yes. The children all said yes too, with great excitement:

Some responses were:

- Yes. Though this may appeal to a younger audience who are early adopters of new technologies!
- Yes
- I've never been on a ferry, but it sounds nice!
- Yes Example - Mersey ferries have onboard commentary, but this is quite dull. If this was interactive and perhaps showed the docks over time with ships queuing in the river it would be amazing
- And showing the ferries arriving that would be amazing

Q21: Would you like it to tell you more about the destination you are going to? If so, what sort of things would you be interested in finding out about?

Children:

The children weren't interested in this question. They said they didn't want to know about destination, and several commented that there are already apps for that sort of thing, or you can find out on google/you might as well find out on google/why waste time when you can do that at home, why not have fun exploring the ship with the story app/game.

Adults:

The adults' responses were:

- Ongoing travel on arrival, places to visit, quirky things not in normal tourist info
- Yes. Interesting things to see/do at destination
- Yes - cultural events, places to visit, off the beaten track, interviews with locals, what's different, unique, unusual. History. Historical figures.
- Yes. Location geography history What's on/ theatre, live music ect.
- animals, history, plants
- Yes. Good restaurants Good culture - theatre, cinema
- Places to stay, see and eat
- History, events (Current and past) famous people
- Cultural history, famous people or stories, interesting facts, the most popular activities, the best places to eat.

Q22: How interactive should it be, and what interactive features should it have?

The adults struggled a little with this question, some not really knowing what it meant, eight skipped it. Some requested any interactivity should be easy, and one commented that this is something for children.

The children had no problem coming up with lots of ways this app could be interactive for them.

Adult:

Adult responses included:

- Be good to have something diverting which you can't get elsewhere, so interacting with the space would be good, with the sea
- Don't know. Make it easy to use.
- Easy to read and navigate
- Not sure
- No view
- Interactive features for children, like discovering the story through scanning codes on the cruise. for adults, scanning parts of the ticket, for example?
- The more interactive, the better.
- Don't really know
- Able to see things out at sea.

Children:

Children's responses were:

- Some sort of game
- rewards for doing things
- In-game rewards, so you get a trophy or something for doing different things.
- You want to be in control of the order of the scenes, depending on where you go on the ferry.

- Non-linear, but there is a story.
- Don't need a map, more fun to find things by searching with your phone, come across things.
- Red herrings, fun things.
- You don't need to know where you are in the story, or what exactly you've completed, although you need a percentage to see *how much* you've completed. That way completionists can get satisfaction from completing everything, to get that 100% figure. So, you walk around finding little things, so you find all the elements of the story but also the little side things.

Q23: What would help you to enjoy it more? (e.g., Ease of downloading? Simplicity of design?)

Again, there was a real divergence of opinion here which divided the children from the adults. Most adults wanted things simple and easy. One requested no adverts and another requested that it was shareable with others.

The children were more pragmatic and, as pointed out above, said that ease/speed of downloadability would compromise the richness and quality of the experience. Most suggested it would be better to download it prior to the journey.

Adults:

The adult responses included:

- Def easy of downloading, and fast broadband so no clunky waiting and buffering
- Ease of downloading User friendly / intuitive
- Both of the above. Intuitive.
- Being able to share it so two or more can have the same experience together.
- keep it simple
- Ease of downloading. Simplicity of use
- Easy to download Simple design
- low weight
- No adverts
- Ease of download, simple to use and informative
- Easily downloaded, able to use it without Wi-Fi (especially if the Wi-Fi on the boat isn't free or is temperamental).
- The animation is relevant to the destination (native wildlife or folk tale)

Children:
Children responded by saying:

- Ability to download before journey so you don't waste time downloading.
- Scenes should be very short, as short as 10 seconds, so maybe you just see a safe, for instance and then you get a code pad on your screen and work out the code for the safe. Then you could get a trophy for opening the safe, so a scene when you have to hold up your phone is only as long as it takes for a safe door to open.
- Don't put in QTE (quick time events) e.g., oh no we are going to crash into an ice-berg! That would spoil it if you didn't manage to do it in time, and there are lots of other great ways to make a game fun without QTE.

Q24: If there was an app that helped you pass the time using augmented reality would you use it? (Augmented Reality in this context means that the app might allow you to see fictional characters superimposed onto the real view of the ferry or the sea.)

Adults were generally not that bothered by this! But the children were unanimous about it: Yes of course we would like that, who wouldn't?

- Yes 38.46%
- No 7.69%
- Maybe 53.85%
- Children: 100% yes!

Q25: Would you pay for accessing the app?

Some adults were open to considering this, with over half saying maybe. But all the children said it should be free.

Adult responses:	
Yes	7.69%
No	46.15%
Maybe	46.15%
Children:	
No:	100%

Q26: If you would be happy to pay for accessing the app, how much would you expect to pay?

Given the majority wouldn't pay, this only elicited a few replies from adults which were:

- £1-£3
- £5? Or sub for a test.
- 99p
- £1.99
- £3 per trip
- £1.99
- £5

Q27: If you would not expect to pay to access the app, who should pay for it?

Adults:

The percentage of adults who expected others to pay, broke down thus:

- Advertisers 72.73%
- The Ferry Company 81.82%
- Tourist Boards 63.64%
- Attractions 63.64%
- Promotions 81.82%

·	Other		0.00%

Children:

The children's answers were:

·	Advertisers	0	0%
·	The Ferry Company	13	100%
·	Tourist Boards	0	0%
·	Attractions	0	0%
·	Promotions	13	100%
·	Other	0	0.00%

I had to explain to most of the children what this question meant, in terms of how advertisers might fund it, or attractions. To explain how a promotion might fund it, I described the idea of being able to see an enormous Guinness bottle pouring beer into the sea. The children loved this idea so much that they all voted for promotional sponsorship of the app. They hated the idea of adverts popping up and couldn't understand why Tourist boards would fund it, because they weren't interested in it being a device for finding out about destinations.

The takeaway from the children though is that if we get something really simple but mind-blowing, they are very happy for it to be a brand promotion. They don't want anything overly complex, just mind-blowing….

Q28: What potential benefits would it bring to you?

Given most adults said they would like to get information about destinations earlier, it was no surprise that they expected this app to give them information, but it was interesting that their responses also favoured the benefits of passing the time, i.e., entertainment.

Adults:

From the adults:

- Pass the time, give me info
- Say for example we were heading to the ww1 battlefields, a D-Day immersive experience of being on one of the boats with option of listening to real life accounts would add greater understanding to the trip.
- Education. Shorter tine to find way around destination
- Guiding me on an exciting holiday
- Information
- something fun and informative to pass the time
- Make the journey go quicker Provide useful information/education
- Ability to learn
- More information on my destination that will get me excited about where I'm going. I'd spend more time on deck which would make the experience more enjoyable.

Children:

Children generally were still talking about giant beer bottles here, and ladders to the sky, and icebergs made from rubbish and plastic. They said that an app like this would:

- Make the journey more fun.

Q29: What other kinds of entertainment would you be interested in whilst travelling on a ferry?

Adults
Survey ennui had set in by now so 10 adults skipped this question.
Those that responded said:

- films, dramas, audible (stories read by Stephen Fry!)
- Underwater worlds. Geographic explanation of changing land masses.
- Live music. Film. Interesting cake emporium
- I don’t know
- Cafe Music
- Movies, a beauty salon, somewhere to swim, a library, speed dating
- River and Sea-related movies and documentaries
- Opportunities to learn about the oceans and rivers Seascape painting classes
- Short documentary film on the destination.

Children:
The children said things like

- Swimming pool, bowling alley, cinema,

but they all said they would prefer to play a game in which a giant beer bottle pours beer into the sea - much better….

Conclusion from Surveys

The overall conclusion is that this app would be very beneficial to users and all respondents welcomed it. However, we need to decide on the demographic, and what exactly we are offering. Adults would favour information, but children aren’t interested in information, so it would have to be wrapped inside a storyworld game, which encouraged them to explore the ship. It might be possible to aim it at children (the 12-17 demographic) but hide information for adults? Many adults might be happy for their children to be entertained, but would adults without children feel excluded?

There is also the issue of downloadability to discuss. Adults would prefer something easy, not heavy on their phone memory, not clunky (possibly because they don’t seem to have such high-end devices?) whereas children are happy for something to take a long time to download (as long as it can be done before travel) because they know it means that the game/story/interactivity will be more exciting and valuable to them. The children provided a lot of creative and dynamic ideas, being more in tune with new digital options, and it is clear that their expectations will be higher than those of the adults. They might be disappointed by a simple information-giving app. They want something which helps them to experience the sea journey, and the physical space of the ferry, through story and adventure, games and challenges, rewarded by an excuse to go and spend something in a shop….. So, we need to discuss our direction in the light of these findings.

7.2 Maritime Stakeholder Analysis

We carried out interviews and focus groups involving the following people, through a series of meetings, events and phone based interviews. This included:

Table 10: List of Participants

Name Anonymised	Organisation	Expertise
	P&O Ferries	Ferry Market in UK
	Tourism Ireland	GB to Ireland Tourism
	Dublin Port	Port Sector
	Failte Ireland	National Tourism Strategy
	McCann Manchester	Advertising/Marketing Digital Expert
	Dublin Institute of Technology	Digital Marketing and Tourism Sector
	ARCade	Digital App Development Specialist with AR Expertise
	Draw and Code	Tech Sector/XR Development and Client Needs
	Editor - RINA International Journal of Marine Design, Senior Researcher, Coventry University	Maritime Sector Design Specialist, Design Thinking
	WAVTECH	Tech Investment Strategist
	Mersey Maritime	Maritime Sector Development in Liverpool
	LJMU	Maritime Systems and Training
	Culture Liverpool/Cruise Liverpool/Liverpool City Council	Cruise Terminal Development
	Tourism Northern Ireland	Digital Projects for Tourism Development
	Discover Ferries	Director
	Maritime Knowledge Hub	Senior Lecturer in Maritime Design and Engineering
	BeCreative	Executive Producer (Film and Multimedia, BFI)
	Culture Liverpool	Head of Creative Development

The Following is a truncated transcript of key concerns, comments and findings

7.3 Impact Propositions

Assuming that we already have full access to augmented reality on boats today; what kind of new interactions can we imagine between information/content and people on ferries?

- Navigation, knowing where you are, or where you are going to
- The technology mostly already exists. What is more important is an attitude and behaviour change. Users would need to change the way they behave on ships
- This is creative challenge not a data one. We need to show that digital solutions is more effective and make it more relevant for clients.
- There's value for AR in Maritime as being for navigation, particularly on Cruise Ships where passengers need orientation
- Could you use the time on the ship to get a taste of where you are going, and maybe book things on board. At the moment we rely on magazines and fairly static apps to do this.
- Would also be interested in seeing how this could tap into data from the boat, so that users can learn more about their journey (i.e. where they are, knots, navigational data)
- Treasure hunts and things to pass the time could be very interesting, tapping into parental needs to keep kids entertained. Pokémon Go demographic is quite interesting as lots of people, from 8-late 30s engage in this.
- This could connect to information on the route, famous navigators and discovery around things you pass on land. Getting to discover the boat and to bring quite dull journeys to life.
- I can see the benefits of this to myself, as a regular user of the BELFAST to LIVERPOOL ferry, it does get boring. If there were challenges and things to do to (finding things) pass the time I would use it. Needs to appeal to curiosity.
- This output would be a great starting point for the link between tourism and technology funding linking Belfast, Dublin and Liverpool
- Could the crew use it too, to give them information at key points of the journey
- We have done augmented reality 'stunts' in London, but not sure we would do it again as it was very expensive. It's really only the brands that can afford this kind of stuff, or we need to get IP (game of thrones) to get backing from multiple partners.
- Wayfinding is a problem – for example, in cruises users spend a lot of time getting to know the ship
- For crew it could give navigation information
- the ferry journey used to be a rite of passage into understanding the city until Ryanair. It gave people a context of what Dublin is as a city in a global context. That has now gone
- For our Brands need to have a useful and meaningful role for the end-users rather than being a load of information. Brand Experiences rather than advertising
- There's a want for this technology but not the need, you need to prove ROI and figure out how it becomes part of the infrastructure.
- ·You have time to play on ships, it's a very captive audience, often for a long period of time. It's a really interesting space to start thinking about making it more engaging
- The biggest issue is that people (businesses) are not aware about what is possible; we have systems that can create these kinds of experience; "creativity" is the issue. Only a small percentage of this goes to novel technologies; the reason for this is awareness. We also need to demonstrate ROI for our clients

- How can different screens work together to create a theatre
- Can we create reasons for people to gather and share experiences with this technology. It's about creating an immersive experience.
- How to we create temporary zones of novelty? We need to see people interacting with the content. Content is what is important.
- Physical vs Digital—use the spaces loaded with digital content. No limit to what there can be and could be different layers for different people. It could also be Location based entertainment? Or a Screen based installation?
- We should also consider product designs. Rectangular screens and delivery mechanism are old fashioned, and in some ways so are mobile. They need to be embedded into the architecture.
- People expect more personal control; hence, interactivity is really important
- Focus should be on end-user experience: Unlocking the value in screens; giving the user the ability to interrupt the content and be part of it, to be part of the experience.
- Shopping models are changing; it should focus on experience. We need more complex partnerships between marketing, economic, and culture. A company such as Boots are investing into the arts because they want to keep people inside, even though they don't buy.
- Gamification will be important in terms of making this into an experience, it also needs to be educational if you want to encourage parents to do it with their children.
- French, Dutch and Nordic families like to come over by ferry (These are independent travellers (FITS), who often curate their experience partly when they have arrived. FIT- Free Individual Travel, part of the journey booked but part isn't). This might appeal to them if there was a cultural experience on the boat-- it became a destination as well as a journey. I see this technology for the FIT Market- Free Independent Travellers/Luxury people/Conference people who are higher spend, have more disposable income and stay for longer. There will be far more buying power with these people as are independent, so might be worth focusing on this market.
- French canal boats are the luxury end of cruising, I have a contact, this is probably better the year after you roll out the West Coast technology,
- Would be interested in seeing it tap into the sociability of Pokémon Go, which often brought people together in a shared experience.
- Shipyards in Norway and Finland may be more receptive to your AR proposal than other markets I have a contact in Finland who runs an experience Lab linked to a shipyard, so they will get it

7.4 Constraints and Challenges

Is the current/existing market ready for augmented reality? What needs to change and what do we need to be thinking about?

What are the biggest constraints/challenges/concerns for you and your clients in adopting technology such as AR?

- *·Needs to be more than just a stunt, needs to be part of the business infrastructure – that way it can move beyond just being a thing that marketing departments do. Wanted to move beyond marketing and PR into infrastructure.*
- *Taking a more strategic, infrastructure-oriented approach to engaging audiences with AR is what's likely to interest them most, and that's what we're all about.*

- *The demographics of people who use ferries and cruises needs to be taken into account. They are often in lower socio-economic groups-- will generally be on social media if they have internet access.*
- · *Needs to be scalable to deliver ROI. Should focus content on something that could be scaled easily.*
- *The blippar failure gives us an interesting frame here. They focused on marketing gimmicks but rarely had repeat customers once the original novelty of AR had rubbed off, there is a novelty pipeline that gets easily exhausted and this is currently happening with VR.*
- *Cost is a prohibitor for smaller agencies and experience providers in terms of engaging with cruise and ferry operators.*
- *Guinness and Titanic have done this sort of thing to some extent. But it is largely underexplored as a concept for the wider market, particularly where it can benefit smaller tourism service providers.*
- *Generally I see the cruise market as the bigger market for this, but it's a very different market to the young people and families on ferries. How will it work for both?*
- *Effectiveness is key; measurable and SMART business objectives*
- *We would need to partner with someone to do something like this, to diversify the costs. It needs to have endorsers from other sectors.*
- *If it could appeal to the TOP TENNERS, who are the biggest tourist group, then you are onto something. We don't generally market to them though as they come anyway, but if you could convince them to travel by boat as it's a better 'experience' then that might work. Perhaps it is worth speaking with a TripAdvisor, or a big digital brand. It's hard to think of a travel company that would have more to gain from the use of augmented reality than TripAdvisor, or lonely planet, the user reviews giant.*
- *ROI is hard to prove for smaller tourist organisations*
- *Can't just be gimmick, or showpiece – has to be sustainable and in the very core of the business ecosystem of the clients. This is where AR will create real value*
- *Customer experience is really important to us on our boats, but on longer services its mainly about comfort (such as investment in the cabins and dining areas, arcades and cinemas) as they are more scalable to the diverse user groups we have on board.*
- *Customers tend to be families and groups (driving back home), and holidaymakers in the summer who are driving over for road trips, not necessarily staying in the cities, they spend a bit of time in the cities. Lots of freight users, generally booking cabins to sleep between long haul haulage.*
- *As a port, we tend to invest in 'hard' things such as infrastructure and buildings*
- *The issue is bandwidth and consistent Wi-Fi access whilst out at sea, how could you deliver something remotely that is quite demanding in terms of data. · Once the ship sails there is no internet connectivity, and the GSM Phones do not work a half hour after departure. This is a major issue and most services have limited connectivity*
- *We do have partnerships with organisations such as Diageo and tourism brands who advertise in our magazines etc. You can also book trips through our app (which uses a partner site, dedicated agency getyourguide.co.uk)*
- *It needs to work with standards, so that content providers can easily add to it.*
- *Projected content can give wrong image of the reality. How can we trust it?*
- *COSTS: AR production and maintenance produces high costs. Dynamic Digital solutions expensive. The web is cheaper, and the upfront cost is a HURDLE. Why would I invest, does it worth it?*
- *The point here is that it is not the content that is the issue, it is the mode of delivery. The User experience has to be seamless and easy*
- *We want to move people around beyond the intense clusters of tourism, such as Dublin and Belfast, pushing people to new places. If you could find a way to do that then it would get higher level support.*

- *Tourism Ireland do work with the Ferry Cruise Operators, you would need to have them involved as they have access to bigger budgets.*
- *There may be an opportunity to tap into tourism related investment for this. For example both Liverpool, Dublin and Belfast are investing heavily in getting more tourists.*
- *It's worth thinking about connecting this to bigger IP (for example drinking tourism in Dublin/Liverpool and Screen Tourism in Northern Ireland). If it was a Game of Thrones experience across the Irish Sea I could see that engaging people who wouldn't normally consider ferry travel. Its only really the big IP holders that are making money here at the moment as it is such a nascent form of media (i.e. Pokémon Go)*
- *Could you find a brand that engaged with children, or a key brand that wants to bring people across a particular route (something to do with the sea, a book publisher)?*
- *I can see huge value in retail applications for this though (talking about AR more generally), it's about the experience economy and giving people a reason to go somewhere rather than shopping online. How can you drive people to places? I think the answer is experiences. Need to think about Pines 4 pillars of experience (educational/entertainment/Esthetic and Escapist) --- create a good experience and it can drive people to do different things.*
- *We are keen to see real world precedents of the technology delivering value, it needs to prove the business case. It can't be a white elephant, we have seen this with new technology many times over.*
- *As a destination, we are interested in visitor numbers, engagement in activities and how our city brand travels the world. Anything that enhances the brand of the city internationally works for us. Perception is really important and we invest in this.*
- *1.3 million foot passengers coming into the Dublin port. They don't stay here, it's not a destination for them, but we want it to be more a part of the city, so we are investing in heritage, it's all about getting people to know what's here.*
- *31 million people in airport.*
- *The commercial opportunities here might be quite limited if thinking about advertising. Other media has much bigger numbers and advertisers want ROI*
- *Brands need to engage as they have the money to fund it, someone like Guinness.*
- *We would rather buy something, or buy into something, that is tried and tested. Developing new systems that are unproven are generally not going to get us on board.*
- *Responsiveness. What are the information and materials that we can respond to? People are Tired of information. We need to move beyond this and create experiences*
- *Lots of regular users will preload their phones with content and TV programmed, so you have to compete with that and make it better.*
- *Being an app may also limit its discoverability (app uptake numbers are usually quite low—around 10% of the Irish sea would equate to only 130000 people for example)*
- *Ferry companies are difficult to engage with for tourist organisations, we would love to do more with them.*
- *EXPERIENTIAL. Working with artists. EXCLUSIVE, EXCITING, ACCESSIBLE, INTERACTIVE. Faster Furious part of the spectacle. TEMPORALITY/EXCLUSIVITY.*
- *ROI & FAME (Amplification—OOH is also part of brand building, which is what OOH does well).*
- *There's a creative backlash against the digital. Will experiences go back to being creative—rather than tech focused*
- *The end user is still driving us. Competition drives everything. FACEBOOK, for instance, changed an entire ecology. The Biggest driver is end user, then technology, then pioneers*
- *We are becoming bored by the screen (POST-DIGITAL). Need to defamiliarise and renew the screen experience. Screens are more ubiquitous.*

- *Innovation could lie in new phone/screen interactions*
- *Innovation could come from new types of screen; that serve as multiple things.*

Other comments of note:

- Should consider targeting the boat builders and design agencies, who are keen to use digitally integrated technologies in their ships.
- Would it integrate into our app, or would it be a separate thing?
- Digital services are limited with P&O, our app and onboard services are quite basic. Some Ferry services (via their app) does have ways of getting to know the ship
- Do we also need to also think about Freight users, who are an important market to them
- Summer is generally a better time to do this if it's for visitors and tourists, need to consider the year and who and when things are happening seasonally.
- I have worked with people who work in the cruise industry, and it's interesting to see the kinds of experiences that are popular here--- computer classes are particularly popular with older age groups, who want to use their time away to learn something new.
- We are concerned about Brexit cutting out the UK land border, that's our biggest challenge right now and will have a huge impact on the Irish sea routes for freight
- Failte Ireland are investing in immersive experience development to create more opportunities for tourists to have experiences.

8.0 Business Models

8.1 Evolving XR Business Models

The AR Advertising sector is growing rapidly, making $418 million in 2018, and is projected to grow to $2.46 billion by 2022[94]. Despite over 129 million active mobile smartphone users in the world and the potential to scale to a billion, there is still a consensus that the tech itself, consumer adoption and developers themselves need to mature and evolve[95].

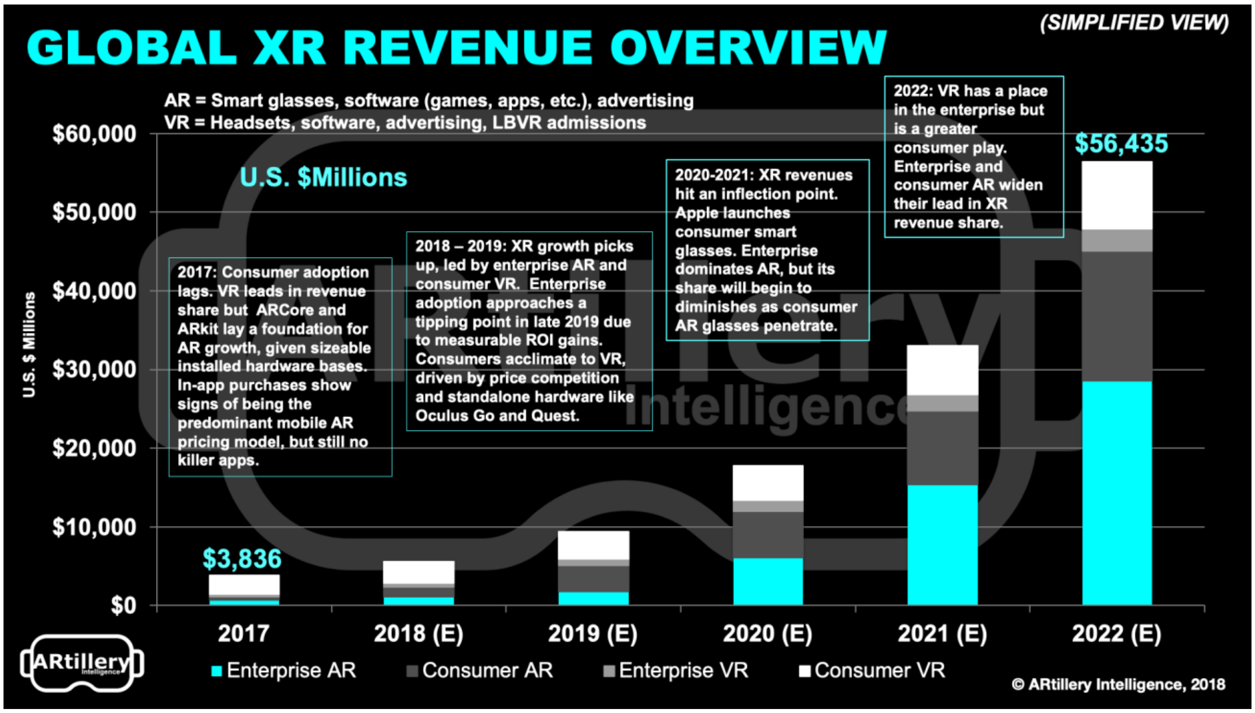

Figure 33: Global XR Revenue Predictions (Artillery AR)

Social apps like Snapchat and Facebook are currently the most commonly used channels for consumer AR. However, there will be more "full funnel" consumer engagement leading to greater brand awareness and conversions If this broadens into visual search[96]

8.2 Forms of Revenue

8.2.1 Ticketed Experiences in Place

What is the market for ticketed Immersive experiences? There are some successful examples of this in the museum sector and the gaming/entertainment sector in the UK. In 2018, *The Science Museum* launched Space Descent VR with astronaut, Tom Peake, which allowed visitors to passively experience the International Space Station. The experience lasted 20 minutes and was priced at £8 with maximum of 125 visitors a day. The Science

[94] Boland, Mike *2018 XR Global Revenue Forecast, Fall Edition*, AR Insider, [Retrieved 31 Dec 2019]
[95] Boland, Mike *2018 XR Global Revenue Forecast, Fall Edition*, AR Insider, [Retrieved 31 Dec 2019]
[96] Boland, Mike *'Drilling Down on 2019 Predictions: AR Ads Primed For Action',* Boland, Mike AR Insider, [Retrieved 31 Dec 2019]

Gallery reported £3.0m in revenue 2017–18 from a number of Enterprising Science projects which include and the UK tour of Tim Peake's Soyuz capsule[97]. Although it was seen as a success for the museum, whose emphasis is on engagement, the headset and physical needs in place limited the amount of revenue than could be generated. There may be possibilities for visitor center experiences either on or off shore with museum or heritage partners.

Also- the replacement of traditional arcade games by VR pods, such as is marketed by InMotion VR on Ferries and Cruises is a possibility. Although VR pods have a huge Asian market, will this appeal to a UK and Irish market? UK North West based, Studio Liddell, offer 4D Motion Rides for clients such as the *Wildlands Adventure Zoo Emmen in the Netherlands (*average ticket prices are 20 EURO) and are seeing a growing market here. But again, this is limited by physical capacity and demands considerable investment in hardware and may be more suitable for cruise line travel.

8.2.2 Downloadable Experiences

Lots of place making experiences are available in VR for download, ranging in price from £10-£50. These do have a market but are mainly focused on a niche market and heritage experiences are not as successful as traditional 'gaming' sectors.

8.2.3 Advertising Revenue

Out of Home advertising currently accounts for 6% of the UK advertising market as a whole, slightly below the global average of 6.4%. France and Russia are far more adapted to this form of advertising spending twice as much as the UK at 10-12%[98]. Early adopters of this tech are billboard advertisers such as *JC Decaux, Clear Channel* and others. The UK's busiest port of Dover, still has limited digital signage, however, and low to average digital followers (150,000 page views per month, with 15,400 Twitter followers and on average 60,000 emails sent per month)[99]. OOH is growing, but may be ahead of its time for some of the UK-Ireland Maritime markets as yet and demonstration may be needed

8.2.4 Brand Sponsorship (Experiences)

As seen from brands outlined earlier, marketing and PR budgets of brands may be a lucrative source of earnings. According to the company's end-of-year figures, drinks retailer, *Diageo* increased its marketing spend to £1.8bn in 2017,which helped it reach net sales of £12.1bn[100] and achieve an operating profit of £3.6bn.[101] The brand are also investing 150m in immersive tourist experiences in Scotland which are a huge income generator for them.

8.3 Drivers of Innovation

What will drive an innovation like this happening?

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[97] Science Museum Group, *Annual Report and Accounts 2017–18,* (2018) [Retrieved 20 Jan 2019]

[98] Magna Global *Ten Reasons why Out of Home Advertising outperforms,* [Retrieved 20 Jan 2019]

[99] Dover Port, *Commercial Advertising Opportunities,* [Retrieved 20 Jan 2019]

[100] Diageo, *Diageo Annual Report 2018 [*Retrieved 20 Jan 2019]

[101] Lepitak, Stephen *Diageo global marketing spend increase helps it reach profit of £3.6bn,* The Drum, (2017) [Retrieved 29 Jan 2019)

- Main aims as a company are to reduce costs and improve revenue streams, this mainly comes from increases in passenger numbers and out of tourist season times are key to this, when there is a lot of spare capacity on the ships. If you can get more people on the boats this is key.
- Pointing the phone at the landscape and seeing what's there is also one interesting future possibility and this could tap into tourism marketing if you could book or buy things on board.
- There may be value in seeing this in terms of AMPLIFICATION for brands. SO for example if people could post via social media the reach might be quite high. This is becoming really valuable to brands in a networked and social media dominated world. If people could share their experience this could create a lot of value in terms of reaching a much bigger audience.
- I think there is a market for this, especially if it is MADE to be scalable to work on Cruise Routes around the world, who are big spenders
- Cruising is highly competitive and they are always looking to open up new markets, such as families and younger people, and to do campaigns around changing the image of Cruise Ship users. Operators define themselves heavily by the tech and additional services they have for their customers- this could appeal to the technologically savvy operators.
- Would it be better to do it on a popular cruise route, such as the Mediterranean. It would need to be internationally appealing though.
- As a promotor of Ireland, we are desperate to reach out to younger audiences. If it could appeal to our Culturally Curious and Social Energiser demographics then that would be good, but they tend to travel by air from the big cities (we focus on London often in our Ireland campaign work). Great Escapers are more likely to use the ferry as they need their cars to explore, but they are not a key demographic for us.
- National Tourism aims to excite the oversees tour operators (who are massive influencers) and foreign consumers. You'd have to convince them that Sea travel was the only way to do the journey to have an authentic experience.

9. Field Observations

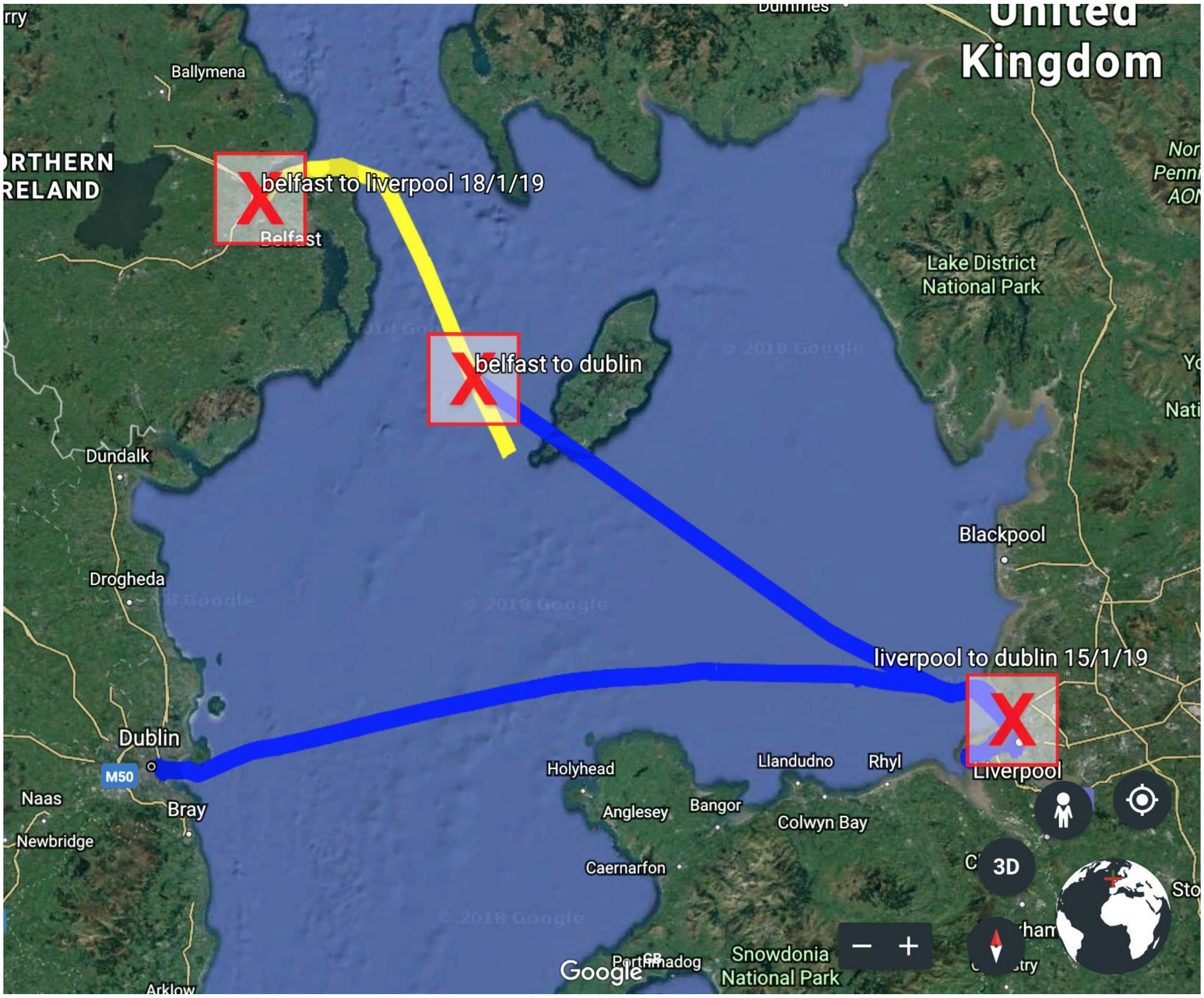

Figure 34: Two Field Trips observed during study: Liverpool to Dublin and Belfast to Liverpool

We undertook observations on two ferry routes across the Irish sea. Including using the time to gather key data for development of a prototype (GPS Tracking, Imagery, Video and Spatial Scans)

9.1 Spatial Analysis- Point Clouds

A key concern in the design and implementation of an AR solution is where it can happen on the boat. Focusing it on a few main areas of the ship (AR VIEWING DECKS/AR DISCOVERY AREAS), would have certain advantages in terms of the complexity of designing a system.

The Following Images Give a sense of the spatial layout of the ship, and the possible identification of key areas for our implementation.






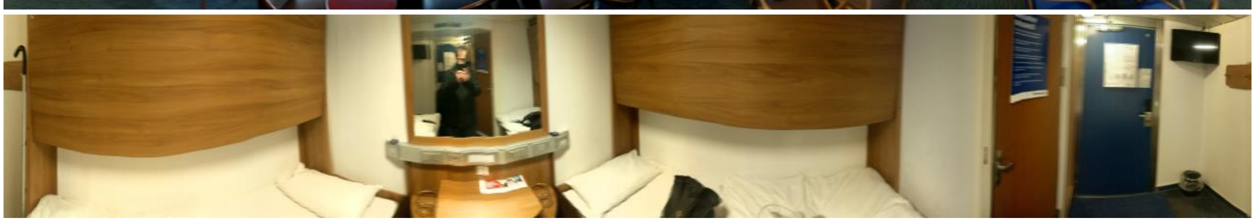
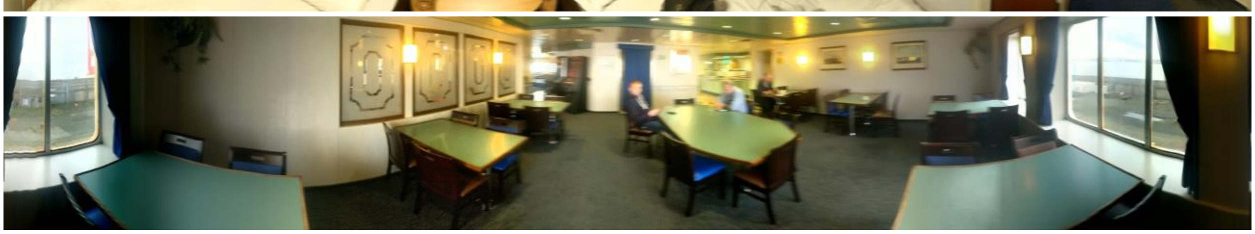
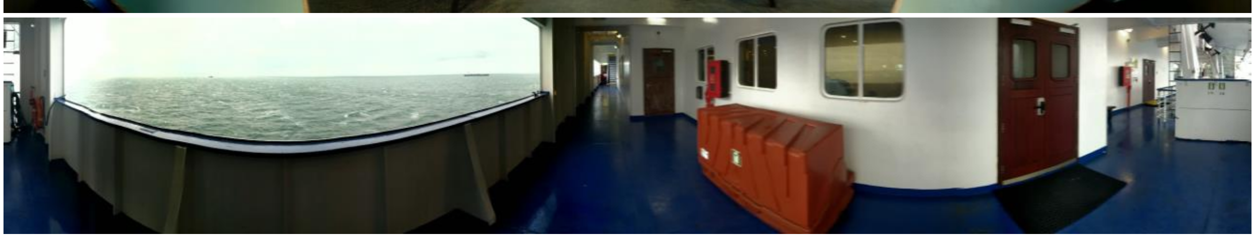

Figure 35: Observation of ferry environments suitable for experiences

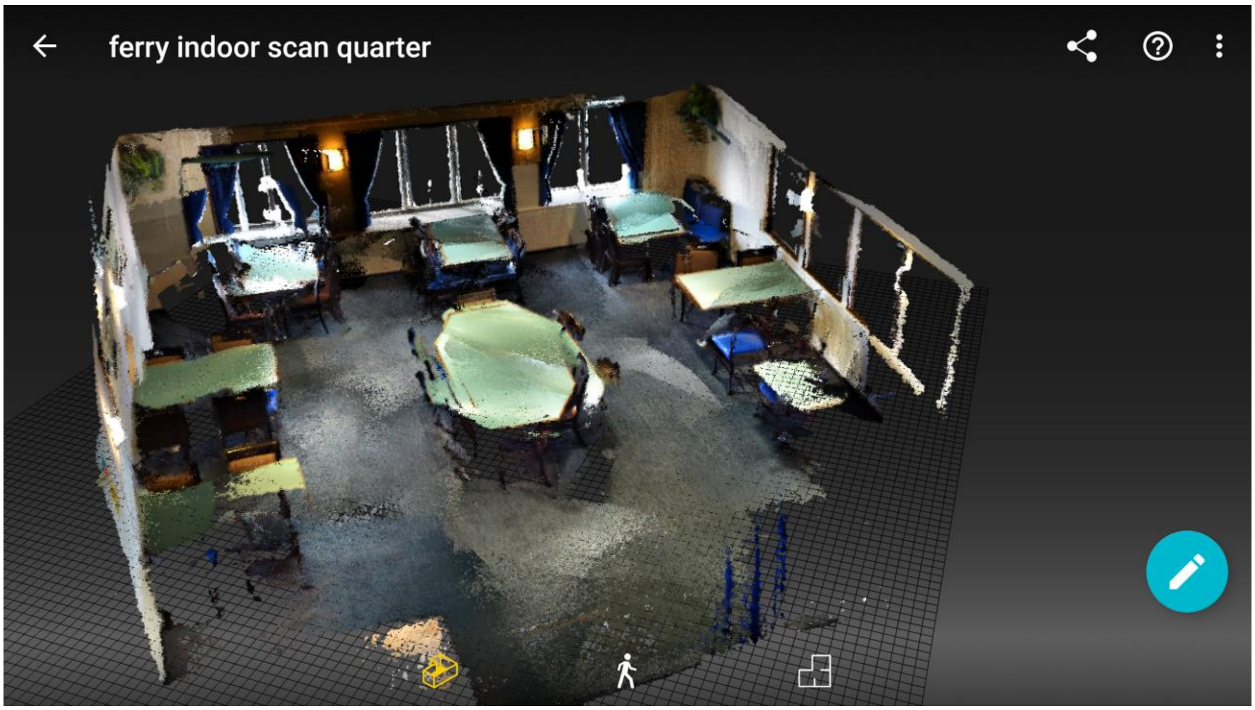

Figure 36: Spatial Layout of P&O Norbay Window Area

Figure 37: Issues with water on the windows

Figure 38: Observations of Ferry Environment

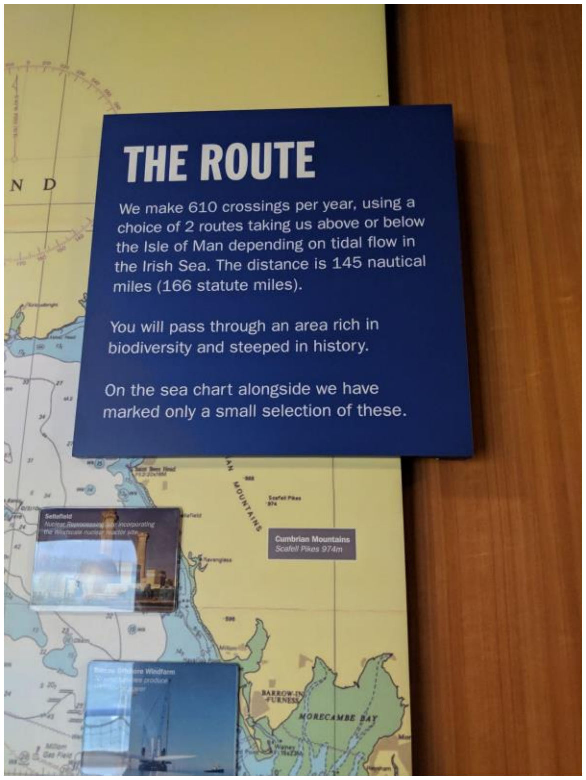

Figure 39: Traditional signage showing the Ferry Route could be used better through digital means

9.2 Temporal Spatial Factors

- TEMPORAL- Time of Year, very seasonal differences in the types of travellers. Summers and Holidays are key points. Day of week is also significant outside of holiday seasons (WEEKDAYS- students, out of work, older people, freight WEEKENDS- much more leisure travel).
- TEMPORAL- nighttime travellers generally sleep//book cabins or use the inside areas to make makeshift beds. At night, the demographics of people also change as well as their activity and spatial habits
- TEMPORAL- Hourly movement of people / density / how many people are in which areas of the ship
- SPATIAL- people are spending 99% of time inside the boat, very few people going outside during the middle part of the journey.
- ENVIRONMENTAL/DATA- weather, noise, wind, sea levels all effect the journey (where the boat goats) as well as the tilt of the boat etc.
- TEMPORAL - Time point of journey, First and last hour of the boat trip definitely sees more activity in terms of people using the boat, with early on people getting to know the boat and the facilities on board. As the boat gets closer to arrival, people tend to start moving around and are interested in going outside to look at the land (and take photos). This could be an important thing to tap into, the anticipation of arriving after making an epic voyage- has a high sharability/amplification factor.
- SPATIAL/CONTENT- not much sense of place, it’s a non-place,
- DATA- GPS signal generally strong on most part of the boat throughout the journey, however it is intermittent on the bigger boat when in the cabin area. Will need a way to resolve this.
- DATA- Onboard WIFI is very focused on some parts of the ships, further pointing to the idea of zoning the ships into different areas
- ENTERTAINMENT- Cinema was generally empty, some passengers complained about the choices

- SPATIAL- installation of bespoke solution for deploying content would be massive across the ship, can we think of ways to focus it around specific areas of the boat.
- TEMPORAL- People definitely tending to stay in the boat during the middle of the journey.
- SPATIAL- People are finding parts of the boat to claim as their territory. Using their bags and coats as flags and warnings to others that this space is taken. They generally stay in the same place for the whole journey. We need to think about this, as there are certain parts of the boat, generally window seats, that become temporary private spaces. Insight- people are using space on the ship like a temporary home, engaging in many of the things they would do in a home environment.
- TEMPORAL- Overall, there is a strong link between the activities that are taking place in destination cities in various places, such as football games, concerts and that change the dynamics of the demographics on the ships.
- SPATIAL In the cabin satellite connection is intermittent, so will maybe have to encourage people to certain areas of the ship. Windows are generally set back from the sea.
- DEMOGRAPHIC Young people generally have their phones out when WIFI available. Some people are going outside but generally the weather is bad.
- TEMPORAL Need to think about how different times of day works in terms of temporal-spatial design (how does the experience, need to accommodate light and low lying sun, night time and sunset.
- SPATIAL. Areas onboard are zoned, news areas, cinemas, arcade, eating areas and lounges. Separation of premium and freight drivers to the standard tickets
- TEMPORAL/SOCIAL After about two hours the journey does start to get tedious, people are mainly drinking and chatting or sitting on their own, half asleep with their phones and tablets. I think not all content needs to be AR and visual, people would just be interested in stuff they could talk about- content as a social activator. The content needs to be a stimulus for conversation, it needs to be socially orientated and shared. DID YOU KNOW, JOKES, SNIPPET Facts, Videos, Competitiveness (like board games as a stimulus for sociability- we don't play them for the game as such, it's about the social sharedness), mysteries to solve together, trails to find stuff. Collect stories.
- SPATIAL - Could we make use of the boat, or screens on the boat, it could be magic mirror type screens- projection mapped, could look back and look out.
- DIGITAL - Onboard APP (P&O) The attractions section of the app includes information about different countries you might be travelling to, with information about key partners that link through to P&O s branded version of the getyourguide.co.uk website. On here you can book attractions such as Harry potter world and over 80 pages of attractions with special offers for P&O companies. For Ireland key partners include Guinness Storehouse, Wicklow Mountains, Cork. There are 272 activities listed that tend to focus on cities (Belfast 52, Dublin 202) for Ireland, mostly with discounts of 10-20%. This app does not work onboard. You can fairly comprehensively plan a whole trip by dates. Getyourguide would be a key stakeholders to engage and their model is revenue share with partners such as P&O and free booking/advertising for experiences and destinations. Irish Ferries and Stena Line's apps are much more basic, offering only information about the service you are on/travel updates. Their vision is "creating personalised experiences"
- INSIGHT - Another customer mentioned that he travels by ferry as it is better for the environment. The environment issue is definitely an agenda we might want to tap into, particularly given the current discourse around plastic in the sea.
- HUMAN- Generally people are travelling in groups, I spoke with the coffee shop staff who said it was mostly families visiting relatives and groups of young people 20-35 going for weekends in either cities, some stag do's/hen do's. It's a very socialisable way to travel.

- CONTENT - Magazine. This contains info about all areas of Ireland currently being promoted, including the 'wild Atlantic way', 'Irish heartlands', 'Irelands ancient east' and 'northern Ireland's. Attractions in here include key heritage and culture assets (giant's causeway, adventures), cities, experiences, places to stay, road trips. Advertisers include tour companies (CIE tours, Johnnie fox experiences, rail tours Ireland), airlines, go Dublin card, Stena line, theatres, whisky (kilbeggan, tullamoredew, x3), national museum of Ireland, Limerick, hotels (inchydoney island lodge), Dublin discovery trails app/walking tours- Dublin city council. Magazines are very scalable though and can go anywhere- DOES publishing offer a business model for the idea??? Stena line have a magazine, mainly promoting stuff in the shop- gifts, alcohol, perfume. Advertisers in there include fashion brands, watches, confectionary.
- DIGITAL- WIFI is provided by 'THE CLOUD' - so need to think about connecting with them.
- CONTENT- Doesn't appear to be much advertising on the boat, apart from for onboard things such as shops. Lots of areas for posters though.
- SPATIAL- This boat is not as smooth as the journey here, and is moving quite a bit, may need a more fixed installation. Boat is quite rocky today and it's hard to get a lock on the AR, I also feel a bit sick.
- TEMPORAL- Did another walk around boat, some people are wondering around aimlessly, couple of people in arcade and a few in the cinema. Spoke to the staff who said that generally on the day boats it's students, people on holiday, pensioners and some people working. Get lots of group travellers.

10. Target End User Profiles for Our Innovation

10.1 Top Tenners

Top Tenners tend to be younger with families. They do not have a holiday ‘agenda’ but are very active on holiday doing lots of stuff, they are looking to have a fun time with partner and occupy the children, if they feel better as a result, that’s a bonus. They are a huge group of people and make up the biggest segmentation profile for tourism. Sites like TripAdvisor are key to their engagement with activities and they can often be fickle with their choices. Often campaigning around other segments will encourage this profile too.

10.2 Great Escapers

They are often couples, approximately 30 years old, some with babies or quite young children. Most are in serious need of time out from busy lives and careers. They are specifically interested in rural holidays and travel very much as a couple or family. Great Escapers are on holiday for a break, to get physical with nature, and to reconnect with their partner. More likely to take part in slightly more strenuous, but not extreme, exploration. More interested than other segments in getting connected to nature especially the more remote and exciting places. They want to connect with the landscape, to feel the earth beneath their feet, to soak up the beauty. A sense of history, of their place in the vastness of nature – they want to feel part of it. Against this kind of backdrop Great Escapers can spend real quality time bonding with those closest to them.

They can rebalance themselves and take stock of their lives, concentrating on what’s important to them. They appreciate peace and quiet between activities … the point is the trip itself. It’s ‘down time’, it’s being off the beaten track, it’s a great escape. But it’s important that getting away from it all is easy enough – they want the ‘wow’ factor without too much effort. Most importantly, Great Escapers want to come home refreshed and revitalised, their batteries recharged. They don’t generally want To make connections with other people – locals or others on holiday - they don’t need to, they’re there to be with each other. They don’t like crowded places.

10.3 Culturally Curious

They choose their holiday destinations carefully and are independent 'active sightseers' looking to visit new places, and expand their experience by exploring landscapes, history and culture. They are unlikely to return for some time once they have visited a new place, and often travel in a couple or as individuals and rarely in a family group. The age group for this demographic is 40 plus. The Culturally Curious visitor is interested in all that a place has to offer, and are attracted to authentic travel. They love to delve deeper into the history of a location, and crave unusual experiences and enjoy connecting with nature and wandering off the beaten track. In terms of their leisure travel needs, They are not generally interested to see things they’ve seen before; to do package trips, ‘laid on’ activities or to be told what to do.

They are most likely to be seen exploring landscapes, In castles, gardens, museums, country houses and art galleries. On literary or film tours, UNESCO sites, visitor centres, browsing for books to deepen their experience.

Enjoying good food and wine, particularly local specialties. At unique local festivals and events. Walking, cycling, or pleasure boating to explore a new place

Culturally Curious are most likely to stay in a hotel, self-catering accommodation or a B&B as long as there's a lot to see. They will usually choose somewhere with access to scenery and good walks. They are three times more likely to take long breaks than average but they also take more short breaks than average, both at home and overseas. They are unlikely to return for a while unless a destination is truly diverse, preferring to move on to new discoveries. In terms of what they will pay for this includes: Something that is out of the ordinary, a human guide that offers real insight into the history of a place and things that have an environmentally friendly features. Their use of social and digital media is growing, they are medium to heavy TV which drives some online search. Generally have lighter internet usage than other groups which is more information driven – preference for search rather than social media.

10.4 Experience Seekers

A high proportion are singles and couples in their 20s and 30s with no children. Highly active, diverse, social and ambitious, engaging with arts on a regular basis. They Make up an important and significant part of urban arts audiences. This group are highly active, diverse, social and ambitious singles and couples and younger people engaging with the arts on a regular basis. Often students, recent graduates and in the early to mid-stages of their careers. Tend to live close to city centres, so have easy access to and attend a wide variety of arts, museums, galleries and heritage. Interests cover mainstream, contemporary and culturally diverse offers and attending is at the heart of their social lives. They are mostly in search of new things to do and have disposable income to spend on a variety of leisure activities like sports/arts memberships, visits to cafes, bars and restaurants. Typically digitally savvy, they will share experiences through social media on their smartphones. Seeking new experiences to support and drive their social lives. This group are open to a wide range of mainstream and alternative offers. Mostly digital natives they search out information online and are keen to 'share' and follow recommendations. They are well informed, feel that they have a range of choices and are likely to form key influencers amongst their peers.

Their engagement with cultural activities is likely to be wide but not deep, though nearly half consider themselves 'arty'. They are mostly seeking out new things to do to accompany their social lives and easy access to a wide range of cultural offers from their home location makes this possible. Whilst attending cultural activities more than the average, their focus on the contemporary and culturally specific is particularly notable. They see plays, galleries, musicals, public art, live music and film – and compared to the population – they are the most likely to engage with culturally specific festivals, jazz, video, electronic art and contemporary as well as diverse forms of dance.

Visits to heritage sites, museums and galleries are frequent with over a third attending 3-4 times a year and two thirds having visited in the last 12 months. As an active group they are highly likely to be involved in a creative pursuit of some sort at some time in their lives – whether performing, writing or creating artworks. They are more likely than the average to have taken part in some sort of dance, acting, singing or playing a musical instrument and the most likely to have participated in some sort of street arts. They may also have tried more traditional activities such as painting, craft and sculpting, as well as arts such as photography, film making or using a computer to make digital art. It is likely that while some of these are more solitary activities, many may be driven by social interaction and participation or related to a professional interest. A highly engaged and educated group (49% have been through higher education) – they are ambitious in their careers and adventurous in trying new things. Some may still be studying while others are well established professionals. Income levels are mixed with 46% earning between £20-40k and 38% earning under £20,000. Ethically and environmentally minded they will seek out organisations and activities which match their principles. Willing to take risks, be spontaneous and lead, they are looking to be well informed and are able to consider a range of options.