

# Evaluating the potential benefits of object based broadcasting.

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**Abstract:** About 15% of the TV hours watched in UK homes is brought into people's homes using Internet protocols and about 85% of the data carried by the Internet to people's homes is video. As the worlds of the Internet and video and television continue to converge this paper explores the impact of treating TV content more like web content. In particular it examines, through a use case based on the delivery of filmed theatre, the proposed benefits to end users of adopting an object-oriented approach to broadcasting.

**Keywords:** Object based broadcasting, Shakespeare, Television, multi-screen experiences.

## 1 INTRODUCTION

Delivering television using Internet protocols is normal. About 15% of the TV hours watched in UK homes is brought into people's homes using Internet protocols (1) and about 85% of the data carried by the Internet to people's homes is video (2). Video On Demand services like Netflix are deemed transformative and have spawned behaviours, with associated descriptive phrases, like "binge watching". These services have also significantly increased the production of serialised episodic drama and invented the 'release all episodes at once' phenomenon. These changes are accompanied by shifts in the industry landscape characterised by the surprising emergence of new competitors (such as Netflix becoming a competitive threat to established broadcasters) and by industry mergers such as the intent of AT&T, a telecommunications service provider) to buy Time Warner (a media production company) (3).

But, in terms of the way viewers experience TV, is that it? Is dismantling the conventional broadcast schedule the only impact that the Internet will have on TV as a creative form?

2-Immerse (4) is an EU-funded collaborative innovation project which is trying to establish valuable use cases that highlight how Internet-based delivery can transform key genres of TV, increasing engagement and immersion through personalised multi-screen experiences. This paper will introduce four use cases being developed within the project. It will focus on the anticipated benefits for the use-case related to the delivery of filmed theatre that object-based production approaches can bring. The paper introduces the concept of object based broadcasting (5) in section 2, and then briefly describes

the range of use cases being explored in the 2-Immerse project before focusing, in section 3, on the use case based on the broadcasting of live theatre. A particular focus in this work is the hypothesis that theatre is a ritualised experience and the retention of aspects of the social ritual will make the at-home experience more attractive to users. The background to this argument is described in section 3. Section 4 introduces the methods used to generate insights that inform the design and also the evaluation techniques. Section 5 describes the results, showing how the key themes identified in the design stage have been addressed and discusses the method agreed to conduct the evaluation.

## 2 OBJECT BASED BROADCASTING

The stories and drama we enjoy on television are an amalgam of content objects: of video, of images, of graphics, of visual effects, of sound effects and of recorded speech all composited during the production process onto the screen against a timeline, then flattened, encoded and transmitted into our homes. But because the composition is completed during production and before transmission, its presentation cannot be tailored to the viewer's context, and neither can the viewer interact meaningfully with it. It is also an awkward and discrete process for producers to create different versions of content for different formats, audiences and territories. 2-Immerse seeks to identify use cases which adopt a different workflow – one where content objects are independently transmitted to the client and flattened at the point of consumption. With this approach, the experience enjoyed by different viewers can vary depending upon their context and interactions, and producers can efficiently develop and control different versions and formats.

The 2-Immerse project is working with content producers to explore the value of this object-based broadcasting approach and the efficacy of some technologies that appear capable of delivering it.

## 3 USE CASES

The 2-Immerse project is working with filmed sport and filmed theatre. These are diverse forms of content which act as a test of the generality of the changes in production workflow that we anticipate. The diverse use cases allow us to probe and explore the benefits that different genres of content can derive from the object-based broadcasting approach. They allow us to ask questions such as "What

is the best way to present particular forms of content given the devices and screens available?"

Each of our use cases enable forms of customisation that are driven by the context of the viewer. That customisation may be based on whether the viewer is: an expert, or a 'newbie'; watching at home or in a pub; a school child or an undergraduate; seeking a social experience or seeking to watch alone. The four use cases are introduced in the table below.

The first technical trials are focused on the 'Theatre At Home' use case using footage of Shakespeare's *Hamlet* recorded by *RSC Live from Stratford-upon-Avon* in the summer of 2016. The project seeks to make available a range of content and services that augment the filmed presentation of the play and that are intended to mirror or approximate the experience of attending the theatre in person.

**Table 1. High level descriptions of the four uses cases being explored in the 2-Immerse project.**

	<p><b>Watching Theatre At Home</b></p> <p>This service innovation prototype is called <b>Theatre at Home</b> because it offers an enhanced social experience for users in a domestic context to watch a live or "as live" broadcast of a theatre performance. The user will have a second screen device that can access synchronized information streams directly from the provider of the broadcast and from the web through social media applications including Twitter but which can also, at times, feature audio and video chat with others who are watching. The service innovation prototype will enable a user to watch a theatre production, shot with multiple cameras, as either a live or an 'as live' experience. Viewers will be able to contribute to and monitor different forms of feedback throughout the performance, and to discuss it with others who are watching at the same time, either in a different room or in a different home.</p> <p><b>Rights Originator:</b> Royal Shakespeare Company</p>	
	<p><b>Watching Theatre At School</b></p> <p>This service innovation is called Theatre in School. This service enables pupils in schools across the country to watch a filmed performance of a play performed by the Royal Shakespeare company. Pupils are able to augment the main filmed presentation of a play with access to related supporting content and experiences to help them deepen their understanding of the play. This related content may include a synchronised transcript of the play, character summaries, short films featuring the talent in the play and even live communication session with the actors and other creative talent associated with the production.</p> <p><b>Rights Originator:</b> Royal Shakespeare Company</p>	
	<p><b>Watching MotoGP at Home</b></p> <p>This service innovation will provide a user with a personalised experiences that can be controlled to suit a viewer's interest in and experience of MotoGP. It will allow video footage and telemetry data to be displayed on a mixture of a large TV and on smaller personal screens. The trials with consumers will take place in multiple sites. Research insights will be captured from device/service instrumentation and follow-up qualitative questionnaires and interviews with trialists. We also plan to carry out VIP demos that could be held both at the track and</p> <p>at other VIP locations (BT Centre, BBC, Cisco, etc.).</p> <p><b>Rights Originator:</b> Dorna Motor Sports</p>	
	<p><b>Watching Football In a Pub</b></p> <p>This service innovation relates to an experience designed to suit UK city centre pubs showing sport. It will mix large screen viewing with opportunities to access content and interactive experiences that may be playful and promotional on personal screens. We anticipate a system capable of supporting a diverse range of experiences centred, ultimately, on a single sport event but that finds a way to encourage and promote business within the pub through promotions and possibly competitions. The trial will be centred on the Emirates FA Cup Final that will be held in</p> <p>May 2018.</p> <p><b>Rights Originator:</b> The Football Association</p>	

### 3.1 Live broadcasting of theatre

Perhaps surprisingly, watching filmed theatre performances on screen, whether live or recorded, is almost as old as TV itself (6) but the practice has recently enjoyed a revival (7). This revival is commonly traced

back to an experiment by the New York Metropolitan Opera which started to broadcast select performances live to cinemas in 2006. Opera and theatre companies including the Met, Royal National Theatre and Royal Shakespeare Company all regularly broadcast specific performances live to cinemas across the world. This

increases the reach of these brands, affords more convenient and cheaper access for a geographically dispersed audience, and also creates significant new revenue both to cinemas and the theatrical producers.

Cinemas owners have noted (8) that audiences attending these live broadcasts have characteristics that are distinct from the usual cinema going audience. Some of this distinction can be interpreted as involving different behaviours – a fact highlighted by Barker (8) following discussion with his local cinema proprietor and repeated below. In the table, the term ‘livecasting’ is used to denote the live (or as live) broadcasting of filmed performances including plays.

**Table 2. Observations of the different characteristics of attending Cinema to watch a film or to watch live theatre broadcasts.**

Films	Cinemas	Livecasting
On the door	Ticket sales	Most in advance
Random	Seating	Pre-selected
Many	Advert/trailers	None
None	Information	Guidesheets
Ticket collectors	Front of house	Ushers/welcome rs
None	Interval	With drinks
Random	Audience	Regulars

Theatres have been careful to assess the impact of live theatre broadcasts as they might be expected to satisfy demand for watching live performances in person and could cannibalise their normal revenues. Initial studies (9) suggest that the effect is largely positive. There is an alternative narrative (10), not currently supported by detailed numerical analysis that suggests otherwise.

A possible extension of the ‘broadcast to cinemas’ model would be to broadcast to TV. There are occasional live and as-live broadcasts such as *Gypsy!* on BBC Four at Christmas 2015 (11) but major theatre brands and broadcasters have not to date collaborated on seasons of live broadcasts for TV. Whilst the reasons for this are complex, a number of producers as well as exhibitors believe that the cinema, as a presentation venue, supports the ritualization of the experience and allows visitors to re-enact and participate in the rituals of attending the theatre. Among such rituals are the possibility of dressing smartly; the collecting of tickets from the box office; the interval drinks; the chance meetings with people you know; the dimming of the lights, the respectful and sustained attention to the performance; the opportunity to project, mirror and reinforce an emotional response; and the general social decorum that audiences obey when at the theatre; all of these are also obeyed in cinemas showing live performances (8). But it can be argued that offering live theatre broadcast to TV would be a very different experience that would fail to prompt similar responses from audiences.

### 3.2 Theatre as ritual

It was Durkheim (12) who is largely credited with developing theories about the critical role that rituals play in enabling societies to become stable, and most especially about the centrality in such processes of sacred rituals.

But as Stephenson describes (13), ‘it was Goffman... who reached for the language of ritual in dealing with the daily multitude of face to face occasions in which matters of deference and demeanour play a crucial role’.

In the work being developed by 2-Immerse both interpretations seem relevant. Using Goffman’s image of social interaction rituals (14) we assert that attending the theatre is a process that includes several such rituals.

We also assert that attending the theatre includes some of the essence of Durkheim sacred rituals even though theatre today almost invariably takes place in a secular context. In particular Durkheim noted that part of the appeal of sacred rituals is that ‘once the individuals are gathered together, a sort of electricity is generated from their closeness and quickly launches them to an extraordinary height of exaltation...’. Such a description, despite its imprecision, goes some way to capturing the way that the pleasure of performance seems to be exaggerated when enjoyed simultaneously with others who are also witnessing it.

### 3.3 Hypothesis

We argue that going to the theatre is a ritualised experience, with most of the interaction rituals facilitating coordination and a few helping support Durkheim’s “collective effervescence” (12). In translating the experience of watching theatre in person to watching at home on-line, we posit that there is value in repeating these rituals. We propose that such rituals can act almost as design cues to set up the experience and allow users to more easily access the pleasure they usually associate with attending theatre in person.

Thus, in developing a mediated form of going to the theatre, we choose to retain this ritualization of the social experience as far as possible, believing that, just as skeuomorphism (15) can be adopted as a short-cut to allowing people to understand the value of a new digital artefact, the affordance of which is obscured by its lack of three dimensional form, the incorporation of the ritualised elements of the social experience will enable people to assimilate and enjoy the new experience more easily.

## 4 METHOD

The method followed should enable us to assess the degree to which users consider that their experience of watching theatre at home has been enhanced by the inclusion of familiar ritualised elements of going to the theatre.

There are thus four elements of the method.

1. Identification of the important ritualised elements of going to the theatre
2. Selection of the elements of the ritualised experience that will be enabled
3. Design of a system that incorporates these ritualised experiences
4. Comparative assessment of the enjoyment gained by watching theatre at home with and without ritualised social elements identified above

#### 4.1 Identification of rituals

Friends, family and colleagues of the authors were asked to solicit from people they knew, contributions on “the processes you recognise as being involved in going to the theatre”. The responses were analysed and the processes were categorised against when they took place and about the theme of the process. The identification of themes was iterative, in that the emergence of themes that had hitherto not been classified resulted in new themes. Analysis was then carried out on the responses received.

#### 4.2 Selection of rituals

The process used to decide which rituals to try to include in the prototype Watching Theatre at Home system was an iterative one. It was informed by an understanding of what makes theatre special, by an analysis of the activities that theatre goers recognise, and by an assessment of ‘do ability’ that was, in part, informed through the process of system design

#### 4.3 System design

Starting from the social interaction rituals we identified as relevant and important, we developed storyboards and from these wireframes that detailed a multi-screen experiences of watching theatre at home. The wireframes detailed the layouts on TV and additional screens (phone and tablet). These were used to guide the application development.

#### 4.4 Comparative assessment

The **Watching Theatre at Home** experience will be assessed through live trials with several groups of households who will be requested to watch a filmed performance of the Royal Shakespeare Company’s 2016 broadcast of *Hamlet* (16). The reported experiences will be understood through both analytics and questionnaires and the experience of a ritual-rich presentation of the play will be compared with a more straightforward private viewing.

## 5 RESULTS

### 5.1 Ritual identification

We received responses, to a request to list “the processes you recognise as being involved in going to the theatre”. from 19 individuals. These responses were provided in a simple list and provided an overall narrative about the process involved in attending the theatre. Each respondent’s style was different, the emphasis they placed on different parts of the process was different and the

level of detail they offered was different; 432 lines of narrative were analysed. These referred to different phases in the overall process. Table 3 shows the summarised results of the survey responses, tabulating the number of mentions of rituals as they related to different phases of the experience.

Through listing the lines of narrative and identifying the themes mentioned in each line, a number of common umbrella themes emerged. In this analysis, some lines could refer to two umbrella themes. For example: “*Going for a meal with friends*” is inherently about eating and drinking and is also a social activity.

**Table 3 Results from the survey of rituals people recognise themselves as completing in attending the theatre**

Mentions	Phase
134	Before the performance (but not the day of)
169	The day of the performance (but not during the performance)
75	During the performance
(35)	(before interval)
(25)	(Interval)
(15)	(after interval)
48	Immediately after the performance
7	When you get home

The most commonly mentioned umbrella theme was ‘*social activity*’, closely followed by actions pertaining to the ‘*logistics and coordination*’ (dates who is available to go, who wants to go etc., that are required to attend the theatre. Activities mentioned the fewest number of times include ‘*looking around the theatre*’. Conversation appears often (55 mentions) these are distributed across the many phases; only one respondent admitted to chatting during the performance.

### 5.2 Ritual selection

In selecting which rituals to try and include in our system design we considered not only the frequency with which a particular activity was mentioned but also both the degree to which addressing this activity in an online experience involves anything new and the degree to which it makes any sense. For example ‘travel’ makes no sense with the at-home experience. In effect, the theatre comes to you. Further, tasks like ‘deciding what to see’ and ‘obtaining tickets’ are already addressed on-line through the marketing apparatus that is deployed to inform people about, and entice them to watch, a particular production. Activities like ‘eating and drinking’; and ‘ensuring personal comfort’ have also been placed out of scope, it is not clear how they could be affected through an on line system.

This leaves as in scope, *social activity* and in particular holding a *conversation* with people who are watching the same performance but who may not be at your home. These can be addressed through including communications software in the system design – allowing remote partners to talk to each other.

**Table 4. Results from the survey of theatre goer, listing the number of mentions associated with different aspects of the ritualization of theatre going.**

Mentions	Topic	Addressed through
78	✓ Social activity	Video chat
68	✗ Logistics and coordination	-
62	✗ Tickets	-
59	✗ Eating and drinking	-
58	✗ Deciding what to see	-
55	✓ Conversation	Video chat
55	✗ Travel	-
23	✓ Responding to the performance, or the audience	Tbd
21	✓ Seats (choosing, finding)	Camera choice
21	✓ Watching the performance	The live stream of the play
14	✓ The programme (reading, buying)	Additional material relating to the production
10	✗ Ensuring personal comfort	-
6	✗ Looking around the theatre	-

### 5.2.1.1 Ritual selection

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In a similar way, the selection of a *seat* becomes meaningless. This is because the filmed version offers a perspective cut together from a number of different camera positions.

## 5.3 System design

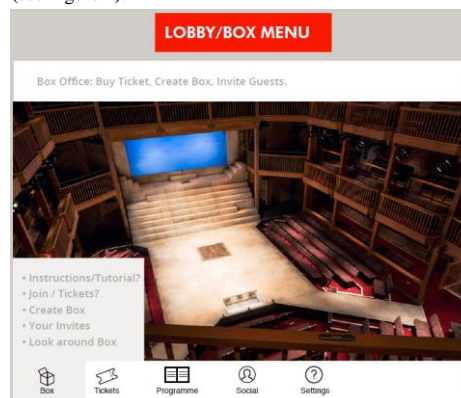
The story boards illustrate key aspects of the experience. Some have a strong technological focus, such as device discovery and service launch, but others are designed to offer some of the ritualistic experience of attending the theatre

- ✗ Being social: communicating
- ✗ Accessing programme material
- ✗ Watching the performance
- ✗ Responding to the performance

### 5.3.1 Being Social: Communicating

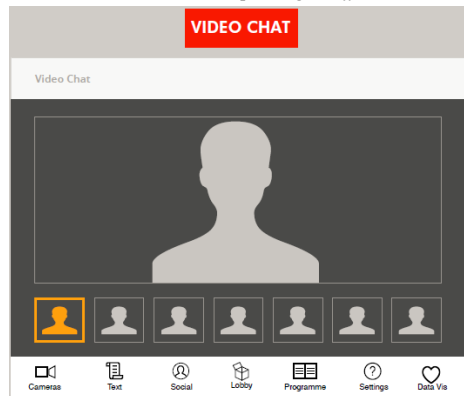
Much of the social nature described by our respondents related to sharing the experience with friends; to negotiating with them about whether they wanted to go to see a particular production; confirming travel and meeting up arrangements; eating and drinking and of course, talking.

We adopted a metaphor from theatre, the theatre box, to create a context in which people who are not physically together can share an experience. Thus we invoked a storyboard that involved people being able to chat to people who shared their virtual theatre box. The user journey is accessed through the “Box” icon in the menu (see Figure 1).



**Figure 1. Wireframe for the Theatre At Home experience highlighting the menu items available under the Box submenu during the set up stage.**

This raised much debate about whether video chat should be enabled during the performance or whether video chat should be limited to spells during the interval, before and after the performance. Only one of our 19 respondents mentioned talking during the performance, one also mentioned being “*annoyed by people who make a disturbance or whose mobile phone goes off.*”



**Figure 2. Wireframe for the Theatre At Home experience illustrating the layout of video chat.**

We discussed the social protocols at play here and whether the technology should prevent them being broken. We agreed to design a system that did not enforce, but which did point to, the normal social protocols – so we illustrated warnings being given that the performance was about to start but decided to not prevent behaviour that, in a real theatre would be regarded by many to be rude (talking during the performance). Instead we chose to observe whether users would obey the normal social protocols even though there is no need to do so; neither the performers, nor audience members you do not know will be able to hear and thus be irritated by your chatter.

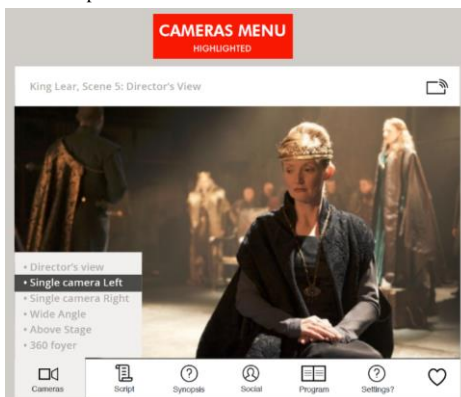
### 5.3.21.1.1 Accessing programme material

### 5.3.2 Accessing programme material

Whilst the programme received only 11 spontaneous mentions, only 18% of the number of mentions that most popular item “being sociable” received, we felt it was one part of the theatre experience over which the producers of the experience had some control. We thus invoked, in our storyboard, the ability to access, share and discuss a range of different assets. One thing we sought to highlight was that unlike a physical programme – which becomes unreadable during the play as the auditorium is dark, in this at-home experience the digital programme assets could continue to be accessed through the performance. In addition programme elements as well as additional material such as the script could be synchronised with the performance, thus giving rise to options to access synopses and the script alongside the performance. This also gave us the opportunity to highlight video material (promo videos, interviews with cast members etc.) and not just stills.

Recordings of the filmed performances that are broadcast live to cinemas frequently provide excellent well-crafted representations of the play. In many cases they are cut together live, from the 7 cameras that are in the auditorium. Like the broadcast stream there is no pause button.

Whilst professional judgement believes this version, selected by a screen director and vision mixer working together, to provide the best experience for the viewer some viewers claim to want to see the performance from a perspective as if they were seated in the theatre – that is, from a single fixed vantage point. To enable viewers to access this option we included in our storyboard the concept that viewers could access different camera views. Practically, only the vision mixed feed is recorded so we cannot access all feeds from all cameras. However we do have available the recording from a fixed camera position that is used to develop the camera script for the live broadcast performance.



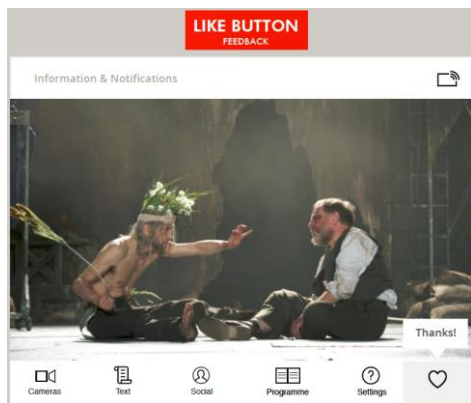
**Figure 3. Wireframe for the Theatre At Home experience illustrating the submenu options available under the Programme icon.**

**Figure 4. Wireframe for the Theatre At Home experience highlighting the possible menu items available under the Camera menu icon.**

**5.3.5.3.4 Responding to the performance**

The deep silence that falls like a blanket over an attentive audience at a moment of high suspense adds to our experience of a play – as does hearing shared laughter or applauding at the end of a performance.

We remain uncertain how to enable audiences at home to show their appreciation. How can you possibly enable applause and not feel silly offering it? At the moment this is an unanswered question but some of our design idea ideas will be deployed and tested and we will report on this question in due course.



**Figure 5. Wireframe for the Theatre At Home experience illustrating the system feedback offered after pressing the Like button.**

A key aspect of this process of responding is that you have the feeling the person you are acknowledging knows you are showing your appreciation, and also that you know the extent of how much others, who are also watching, are reacting to the performance. We illustrated this by suggesting that after pressing a “like” button the system acknowledges your expression with a “thanks”. We also suggested the idea of a graph that plots the numbers of likes against time. In general the designers still feel this is very weak analogy. It is not clear that you should ‘like’ a powerful but emotive scene of violence, anger or betrayal. How should you mirror that blanket of silence that envelops a moment of great sadness? In the theatre the very stillness works and the expression, the stillness, is offered involuntarily. No-one is actively silent -- they just are, silent. It is not currently clear how the intimacy of such involuntary responses can be conveyed from an audience at home.

**Figure 6. Wireframe for the Theatre At Home experience illustrating the way the system could begin to show the response of the wider audience.**

~~A key aspect of this process of responding is that you~~

We stated in the introduction that this work, whilst being inherently technology related, seeks to demonstrate that the experience of watching theatre broadcast into the home can be improved if it includes support for some of the ritualization that is found when attending the theatre in person.

We explore this within the context of multi-screen experiences.

**5.5.15.4.1 Null hypothesis**

We will conduct A-B tests in which the following null hypothesis will be tested: “In watching filmed Theatre at Home, users show no preference for the multi-screen presentation created by 2-Immerse over the presentation that users’ enjoy when left to construct their own experience based on freely available applications, even though the aggregate capabilities may be similar.”

Assuming the null hypothesis can be disproved we ought to be able to explore why this is the case:

- is it because the streams are better synchronised in 2-Immerse?
- is it because we enforce rituals?
- is it because the apps talk to each other?
- is it because there is a common look and feel?

**5.5.15.4.1 Recruitment**

Instances in A and B test groups consist of groups of households. Each group will consist of at least two (and no more than four in a group) households with at least one participant per household watching *Hamlet* at home on a TV at a pre-arranged time.

A and B groups should not be aware that they are taking place in an A-B test. Both groups will be asked to communicate within their test group about the play before, during and after the performance, as they wish. The A group will, at recruitment, be invited to communicate with

each other using the communications tools they would normally use (phone, email text, social networks etc.).

The B group will have access to the 2-Immerse tools.

#### **5.5.4.1 Evaluation**

A range of evaluation methods are planned including interviews, surveys, analytics and video recording. Interviews with participants, guided by a script, and surveys will be used for comparative studies and analytics and video will be used for analysis.

#### **5.5.4.1 Status**

At the time of writing (Nov 11<sup>th</sup> 2016) the system to deliver the multi-screen components is under construction. Its design and structure will be discussed elsewhere.

Trialists are being recruited and the plan is for a dress rehearsal of the trial to take place in the last week of November with the test scheduled to take place in early December.

## **6 CONCLUSIONS**

A multi-screen experience designed to enable groups of people to enjoy, at home, a screen version of a live stage performance of *Hamlet* is being built. The experience is being developed to deliberately reinforce many of the social rituals that attend going to the theatre, in the belief the experience of watching filmed theatre at home can be improved if it includes support for such interactions. This hypothesis will be explored through live trials, and results derived from questionnaires and analytics of behaviour will be reported in due course.

## **7 ACKNOWLEDGEMENTS**

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