Innovation in Arts and Cultural Organisations
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NESTA INTERIM RESEARCH REPORT[1]

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1.   Introduction

Interest has grown in recent years in the role of the arts in the creative economy. Increasingly policy strategies are recognising that the creative arts lie at the core of the creative industries, feeding the wider creative sector and other industries in the economy at large (Throsby, 2001, KEA, 2006, Andari et al., 2007). The arts industry is made up of creative enterprises ranging from small individual-based artistic firms to large-scale cultural organisations operating in both commercial and non-profit sectors. Amongst these organisations, publicly-funded cultural institutions such as theatres and galleries play a vital role in nurturing and advancing the arts and in creating public value. These enterprises operate in a challenging environment, made the more so by the current economic downturn. In these circumstances cultural institutions are having to reassess their business strategies to ensure that they are still capable of delivering on the artistic and cultural objectives which are their fundamental and inalienable purpose (National Campaign for the Arts, 2009).

In most industries, including the creative sector, innovation is a key to gaining competitive advantage and enhancing growth prospects in difficult times. But for cultural institutions, the meaning of concepts such as competitive advantage, product development, business models and so on which are so familiar in the business world need a fresh interpretation. Indeed the concept of innovation itself is not at all clearly defined when applied to organisations in the arts. Little is known about the various ways in which these institutions engage with, adopt, utilise and contribute to processes of innovation. This is partly because of a lack of a systematic understanding of how innovation relates to the functions of such cultural enterprises, and partly because of a

lack of an established methodology for quantitative analysis of innovation processes in the cultural sector.

This gap in knowledge about innovation in arts and cultural institutions creates the potential for serious confusion, as arts funders call on organisations they are supporting to be more 'innovative' in their work without being explicit about what they mean by 'innovation' (McMaster, 2008).

NESTA's aim in this research project is to develop an economic analysis of innovation applicable to a range of cultural institutions across the different areas in which they operate, and to generate robust empirical evidence, in particular on how they can use innovative digital technologies to expand, and deepen their relationships with, audiences. We focus on digital technologies because of their potential to allow arts and cultural organisations to achieve a step increase in the audiences for their art and, in some cases, become major broadcasters of public service content in their own right (DBIS, 2009).

The project will achieve these objectives by offering a conceptual basis for understanding how publicly-funded arts institutions relate to their audiences, and by undertaking data collection and analysis of two case studies – the National Theatre's *NT Live* experiment and the Tate's use of online content – to throw light on cultural institutions' use of digital channels to reach new audiences. We anticipate that the project will yield results of interest and usefulness both to cultural institutions which are developing innovative business models around digital technologies, and to funding organisations like the Arts Council, England and the Scottish Arts Council which are trying to encourage innovation in the cultural sector.

What does innovation mean to cultural institutions?

Historically, the discourse on innovation has assumed it to be of a functional, scientific or technological nature, reflected in indicators such as investment in formal Research & Development or the number of patents awarded (NESTA, 2007). This is partly because standard economic models see innovation of this nature as the driver of economic growth. The growth focus also explains why policymakers have concentrated in particular on innovations in commercial or market settings: for example, Sir George

Cox defines innovation as the *'successful exploitation of new ideas. It is the process that carries them through to new products, new services, new ways of running the business or even new ways of doing business.'* (HMT, 2005)

But it is now widely acknowledged that innovation goes much wider than this, and that measures focusing on functional or technological novelty ignore innovations in sectors such as services which account for a dominant and increasing share of overall economic activity (DTI, 2007, Abreu et al., 2008). Miles and Green (2008) document high levels of innovative activity in the UK's creative industries which are 'hidden' from traditional measures of innovation. Stoneman (2009) identifies economically important changes of an aesthetic nature – which he terms 'soft innovation' – that are particularly prevalent in the creative industries. Innovation outside the business sector is also increasingly recognised as crucial for addressing challenges of a social nature. Mulgan et al., (2007) highlight innovations which respond to social needs by third sector organisations and public sector bodies that are not motivated by profit.

DIUS (2008) concludes that *'Innovation is essential to the UK's future economic prosperity and quality of life. It can be defined as the successful exploitation of new ideas, which can mean new to a company, organisation, industry or sector. It applies to products, services, business processes and models, marketing and enabling technologies.'*

Yet it is to fair to say that even these recent studies say next to nothing about innovation types and processes as they relate to publicly supported arts and cultural institutions. While an increasing number of studies point to distinctive innovative behaviours in the creative industries (Handke, 2008, Miles and Green, 2008, Potts et al., 2008), none of these studies focuses specifically on arts and cultural bodies.

In their study of product design, advertising, television production, and video games businesses, Miles and Green (2008) propose an innovation taxonomy which captures five broad overlapping areas of innovation practice within creative businesses, arguably all of which apply with varying degrees of relevance to arts and cultural institutions: creative firm innovation; innovation in production/pre-production; product (content) innovation; user experience innovation; and innovation in communications (see Figure

1 below).

Figure 1: Sites of innovation in creative businesses
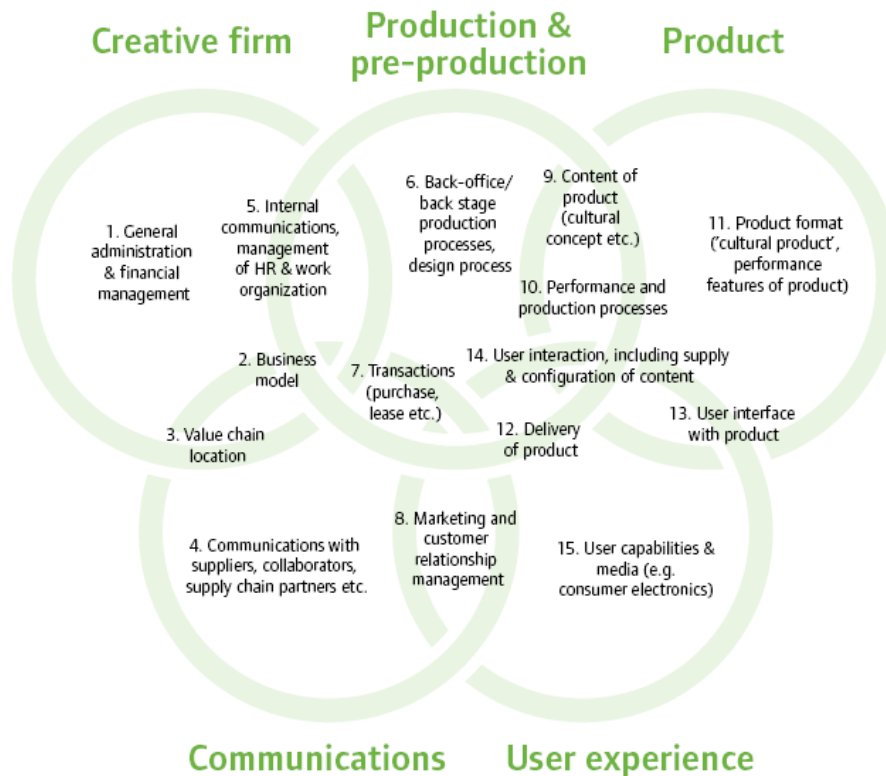
Source: Miles and Green (2008)

Many publicly supported arts and cultural organisations would identify with the 'sites' of innovation practice identified in Figure 1. But there are also significant differences in the ways these organisations relate to innovation, reflecting the artistic and public value objectives that invariably make up their missions. It is possible to identify at least four broad categories of innovation that are common to cultural institutions across the creative arts:

- ***Innovation in audience reach***: this relates to the generation of new audiences, including through use of digital technologies such as online collections in the case of art galleries or museums and digital broadcasts in the case of theatre or opera companies. Cultural institutions may also innovate in the *depth* of their engagement with audiences, for example by using knowledge resources online

which enhance the audience's experience of artworks, by interacting with audiences on social networks, or by providing opportunities presented by digital technology for audiences to get involved in artistic creation itself.

- *Innovation in artform development*: one of the most significant innovative contributions cultural institutions can make is to the development of the artform in which they operate, through the encouragement of new and experimental work in their programming.

- *Innovation in value creation*: cultural institutions are searching for new ways to measure the economic and cultural value they create for audiences and their wider group of stakeholders, and to translate these into terms that policymakers, funding agencies and private investors can relate to.

- *Innovation in business management and governance*: cultural organisations face challenges in strategic management that are peculiar to the artistic or cultural area in which they operate; dealing with these challenges often requires adoption of innovative methods of cultural management, including the use of new value-oriented measures of success as above.

We prefer to think therefore of innovation along these dimensions as responses to changes which are disrupting what might be described as the value chain for cultural institutions (Figure 2). This differentiates between the production, distribution and consumption of artistic content on the one hand, and the flow of content, services and money on the other.

Figure 2: The value chain for cultural institutions
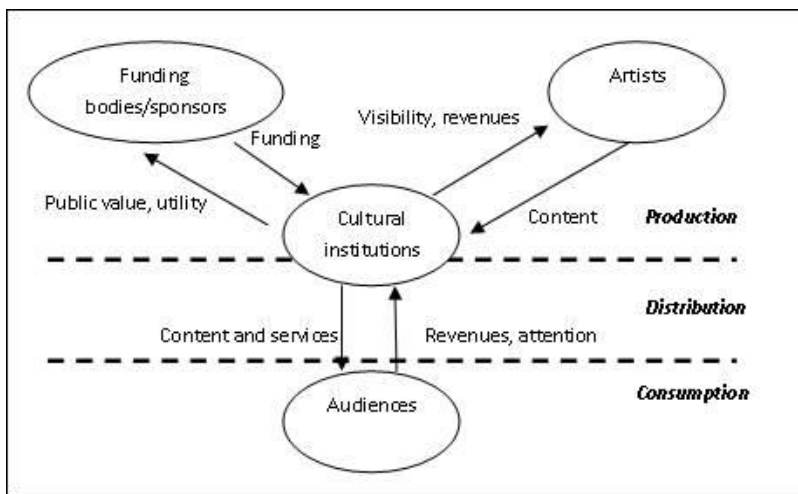
This value chain highlights the various trade-offs which cultural institutions may face in pursuing their missions, including access versus revenue generation, creative vision versus responsiveness to audience, artistic experimentation versus revenue maximisation, and public value generation (which is difficult to measure) versus – readily measured – revenue generation. Changes in consumer behaviour, rapid technological progress – particularly in the digital sphere – and shifts in the funding environment are all disrupting the terms of these trade-offs, forcing cultural institutions to re-evaluate their strategies. They give rise to the principal research questions we attempt to address in this project which are:

- What is the actual and latent demand for innovative work from arts and cultural institutions amongst existing audiences and potential new audiences?
- How can cultural institutions use innovative digital technologies to reach new audiences?
- How can cultural institutions use new digital technologies to deepen their relationship with audiences?
- Are there novel concepts and methods that cultural organisations can use to value what they do and, if so, how should they be applied?
- Do all or any of these avenues for innovation lead to the development of new financial and business models for cultural institutions?

Empirical focus

The project will derive its empirical evidence from in-depth quantitative case studies of two of the most important cultural institutions in the UK, the Tate and the National Theatre. There are several reasons for choosing these organisations as the basis for the project's empirical investigations. First, concentrating on just two institutions enables a deeper exploration using formal experimental techniques of the issues involved than would a more superficial study of a larger number of cases. Second, the Tate and the National Theatre are publicly-funded arts-related enterprises with significant economic and cultural profiles. Both are exemplary instances of major UK cultural organisations that are international leaders in their respective fields of the arts. They make a major contribution, within their own artforms and beyond, to cultural life both at home and abroad and they form a significant core component of the UK creative economy. Both organisations are playing a leadership role in developing innovative strategies for reaching new audiences, expanding the art form, exploiting digital technologies and creating public value.

By exploring in depth the innovation strategies of these two leading cultural institutions, the project is expected to yield lessons for, and gain the attention of, arts and cultural organisations more generally. Experimental research calls for particularly close cooperation between the researchers and cultural institutions. We believe the methodology we have developed – which involves the co-creation of knowledge by researcher and cultural institution which is then shared with the wider sector – may be a model for publicly funded research which warrants further attention (Bakhshi, Desai and Freeman, 2009).

This interim report provides an overview of progress in this research project. In the following section we provide a brief account of the existing state of play in the conceptual understanding of cultural organisations as non-for-profit business enterprises, and then in Section 3 we discuss recent research in the four areas of innovation identified above, considering each area in turn as it is applied to museums and galleries and to organisations in the performing arts. In Section 4 we probe in further detail what art galleries and theatre companies specifically are doing by way of using new technologies – the main focus of our research. In Section 5 we go on to

describe the two case study institutions and how they in particular are currently meeting the innovation challenge. In Section 6 we summarise the results of our new and ongoing econometric analysis of audience demand for our two case study institutions, focusing in particular on what this means for their work in attracting new audiences and innovation in extending the artform. Finally, in Section 7, we outline next steps for the experimental research that provides the essential empirical contribution of the project.

2. Conceptual basis for this research: modelling the behaviour of arts and cultural institutions

Arts and cultural institutions pursue multiple objectives – some couched in artistic and creative goals, some in terms of audience engagement, and others related to their public and social impact. These objectives, in turn, reflect the priorities of institutions' funders and sponsors.

This multiplicity of objectives is mirrored in the heterogeneity of observed financing structures, with museums and galleries, for example, having very different funding structures from those characteristic of performing arts organisations. Even within art forms, financing patterns can vary enormously, with touring theatre companies, say, having different financial structures from companies that own their own venues (Bolton and Carrington, 2007).

Governance structures are probably less varied across the arts and cultural sector than are funding structures, with the standard model being a charity, which may or may not be supplemented with a profit-making trading subsidiary that channels its profits back into the charity using tax efficient mechanisms (Bolton and Carrington, 2007). Although a growing number of arts and cultural institutions are adopting innovative governance structures, notably establishing themselves as Community Interest Companies (CICs) which are less constrained than charities in their use of equity instruments (Voluntary Arts Network, 2007), the overall numbers are still small.

For all these reasons, the basic theory dealing with the operations of cultural institutions as not-for-profit firms is still a useful starting point in building a conceptual framework for the economic analysis of these institutions (Throsby, 2001). The

essential purpose of cultural institutions is clearly not one of maximising shareholder value in the direct financial sense. Rather, their objectives and the rationale for according them legal status as not-for-profit organisations is that they serve some larger social purpose. The cultural role of publicly-funded art galleries, museums, theatres and so on is obviously the way in which this purpose is realised.

There are several theories as to why non-profit businesses emerge in market economies. One of the earliest was proposed by Burton Weisbrod, who argued that they exist in order to meet a shortfall in the supply of public goods by the government (Weisbrod, 1977). This theory postulates that when the public sector finances the provision of such goods, it does so in order to accommodate the preferences of the median voter; as a result people whose demand is for a greater supply will remain unsatisfied and will therefore be willing to support the establishment of a non-profit organisation to make up the shortfall. This, according to Weisbrod, explains the existence of not-for-profit firms in areas such as education, health, social services and the arts.

An extension of this argument is that people will donate money to non-profit firms because the firms are producing socially desirable output such as cultural or educational services and because donors believe the firms to be trustworthy (Rose-Ackerman, 1996). Henry Hansmann sees such donations as a form of voluntary price discrimination whereby consumers donate some part of their consumer surplus to organisations that are doing things of which they approve (Hansmann, 1987). An example of voluntary price discrimination in use in the arts is the pricing scheme adopted by the Metropolitan Museum in New York which allows visitors to the museum to choose their own entrance fee level.

A characteristic of non-profit firms particularly in the arts derives from the cost and revenue conditions under which they produce their output. Many firms such as galleries and theatre companies have high fixed costs relative to variable costs, and a relatively low level of demand; as a result their average cost of production is greater than average revenue at all levels of output. In these circumstances there is no ticket price at which they can sell their services which will cover costs, and they have to rely on subsidies and/or donations in order to stay in business. It is apparent that neither public authorities dispensing financial assistance to such firms, nor private individuals making

donations, would do so if they thought that the recipient firm might pocket the money as profit, hence the non-profit form becomes the appropriate business arrangement under which these enterprises are incorporated (Throsby, 1994: 12).

In applying the theory of the non-profit firm to arts and cultural organisations, economists have been able to construct models that depict the structure and mode of operation of these businesses (Netzer, 2003). One of the most widely recognised models portrays the firm has having an objective function involving the joint maximisation of the level of output and the quality of output, subject to a break-even budget constraint (Throsby and Withers, 1979). When applied to a theatre company, for example, such a model implies that the firm tries to attract the largest possible audience to its shows, at the same time as striving for the highest quality standards in its productions. Much as some arts and cultural organisations might want to pursue their vision without thought for the financial consequences, the reality is that cost and revenue outcomes will impose a constraint on what can be done – specifically, if the firm does not cover its costs from a combination of its earned and unearned revenue (box office and subsidies/donations respectively) over a given period, it won't be able to stay in business.

In an early paper Hansmann (1981) portrayed the objective of non-profit performing arts organisations as lying in a continuum between audience maximisation on the one hand and quality maximisation on the other. In a wider context, referring to non-profits in general, Steinberg (1986) described a similar spectrum as ranging from 'service maximisation' to 'budget maximisation', the latter being roughly equivalent to the quality maximisation objective of arts-related firms.

There have been a number of applications of these sorts of models to specific types of cultural institutions. An example is the study by Luksetich and Lange (1995) into the behaviour of non-profit symphony orchestras which aimed to test the Hansmann hypothesis on voluntary price discrimination. Another is that undertaken by Brooks and Ondrich (2007) which attempted to infer from data for a number of American public radio stations what the firms' managers' objectives were. Both of these studies yielded results that are broadly supportive of the underlying hypotheses concerning the range of objectives that non-profit cultural institutions typically pursue.

These studies and other research on non-profit behaviour confirm the multiplicity and complexity of objectives that are a characteristic of cultural institutions' operations. We can therefore suggest that a generalised model of the behaviour of not-for-profit cultural institutions would be likely to specify at least four dimensions to their objective functions:

- objectives relating to artistic or curatorial quality or standards, whether or not this is described as pursuit of 'excellence';

- objectives relating to access, i.e. to making the output of the organisation available to as large a number and to as wide a range of consumers as possible;

- objectives relating to educational services, i.e. a focus on providing specific programs to engage and educate young people; and

- objectives relating to research – for museums and galleries this would refer to a range of functions in archaeology, art history, anthropology, conservation practice etc.; for performing arts companies it would relate to developmental work on repertoire, performance practice etc.

Some cultural organisations also have explicit social objectives in addition to their cultural goals, for example community-based organisations with a mission to promote social inclusion and participation, or organisations devoted to using the arts in the health care field.

Within this generalised model, the pursuit of these multiple objectives – however they are weighted in terms of overall decision-making – must still be seen to be subject to a set of financial constraints that ultimately require a balance to be achieved between revenue and expenditure. In other words the business model deriving from these theoretical foundations and observable in practice is one where the organisation:

- identifies objectives along the above lines;
- sets prices that strike the desired balance between accessibility, revenue raising and meeting quality goals; and

- seeks to develop as strong and diversified a portfolio of unearned revenue sources as possible.

Such a business model could be seen as a standard representation of non-profit behaviour as it has evolved in the arts and cultural sector over the last several decades.

The Four Drivers of Change

But in more recent times, the environment within which cultural institutions operate has been changing, prompting the rebalancing of the objective function and the development of new business models that are better adapted to serving these objectives. The principal drivers of change have been the following:

(i)   *Changing patterns of demand*: Consumer behaviour is not static, and cultural organisations must be constantly aware of the ways in which the preferences and spending patterns of their audience change over time, both cyclically in the short run and in terms of longer secular movements that may require more significant adjustments. An example of short-run effects is the impact on demand of temporary events such as recessions or flu pandemics which affect tourist movements and consumer expenditure; the apparently increased severity and frequency of such occurrences over recent years has brought about a need for greater flexibility in the business strategies of cultural organisations to enable them to respond effectively.

In the longer term there are signs of specific shifts in the ways in which consumers allocate their cultural spending; for example, Ravanas (2007) notes that many performing arts companies are experiencing a decline in the renewal rates of subscribers and season-ticket holders, prompting a move towards more flexible packages and greater diversity of one-off offerings. Such a strategic re-positioning of the non-profit arts organisation's relationships with its customers may also be aimed at widening its audience to reach segments of the population that are not currently theatre-goers or gallery-attenders (Gayo-Cal, 2006; Arts Council, England, 2008).

Another significant trend is that consumers are spending more and more of their time and money on leisure pursuits that are online (Ofcom, 2009)[2], raising the possibility that they cut back their spending on traditional 'bricks and mortar' arts activities. Concerns about such substitution, or 'cannibalisation', effects are usually framed in terms of the impact that online leisure activities have on recorded artforms such as film and music, where the online experience and recorded art are arguably close substitutes. By contrast, artforms such as the live performing arts and the visual arts are widely presumed to be protected, on the grounds that consumers value highly the 'real thing' (Arts Council, 2009a).

The most innovative arts and cultural institutions are already thinking hard about how the internet and convergence in communications markets affect their operation, where 'convergence' refers to the growing tendency for audio, video, text and picture formats to reach consumers via a more and more concentrated range of consumer devices, especially mobile platforms. Whether such developments give rise to cannibalisation effects on traditional forms of cultural consumption, however, is not something that has been evidenced to date – a gap our study seeks to partly address.

The rapid growth of user-generated content, illustrated in the rising popularity of peer-review websites like www.yelp.co.uk and specialised content websites like Flickr, which is dedicated to photographs, may also have implications for arts and cultural institutions. Knell (2006) distinguishes between two dimensions of what he calls 'personalisation' of cultural goods and services: first, equipping the product with the ability to tailor and personalise cultural experience, and second, inviting the user to co-produce the art by encouraging active participation.

Knell gives some examples of leading edge practice of personalisation of cultural services (one early example being the Welsh National Opera's decision to make music and video files of their performances available for download), but he argues that these result largely from the creative decisions of individual artists in particular art forms (in particular music, contemporary visual art and media art). They do not reflect strategic decisions on the part of arts and cultural organisations.

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[2] Ofcom (2009, section 1.2.6) reports that UK consumers spent on average 25 minutes per day online in May 2009, compared with just nine minutes five years ago.

Hughes and Lang (2006) go further and describe emergent digital remix behaviours as an 'open source' approach to culture, where cultural products are increasingly 'ripped, mixed and burnt' into new cultural products. The availability of digital technologies has facilitated this participative culture, but its importance in the arts, these authors argue, reflects the distinctive nature of cultural products – in particular, that meaning is ultimately only created by audiences, that the value of cultural products is realised as a social process, and that by their very nature many cultural goods and services have the characteristics of public goods.

This discussion of the implications of open source culture for businesses may have lessons for arts and cultural institutions too. Hughes and Lang (2006) argue that: (i) businesses must look for opportunities to sell products which are complementary to cultural products; (ii) community-based collaboration enabled by new technologies can outperform traditionally closed business solutions, and (iii) digital technologies, at least in principle, allow for the development of new business models which involve satisfying cultural demand from niche audiences (the 'long tail').

(ii) *Changes in unearned revenue sources*: As noted earlier the term 'unearned revenue' in the theory of the non-profit firm refers to all the sources of finance that do not relate to the sales of goods and services by the firm, i.e. grants, subsidies and project funding supplied by any level of government, and donations provided by philanthropic individuals, private-sector corporations, foundations and other non-government bodies. Increased pressure on government budgets, together with a drive for greater accountability in public spending, is affecting both the levels of funding allocated to cultural institutions and the terms on which it is provided. At the same time private-sector support is also subject to variations in the economic outlook and other factors; again both the levels and conditions attaching to such funding have been affected (Toepler, 2006, Arts & Business, 2009, Arts Council, England, 2009b). As a result, non-profit enterprises in the arts are being obliged to adopt more active business strategies in a search for new sources of financial support and new ways of relating to existing sources (Bolton and Carrington, 2007 give examples of arts and cultural institutions using loans and equity-type instruments, but, in the absence of aggregate statistics on the use of these non-traditional sources, it is not known how common they are).

(iii)   *Changing technology*: A major driver of change in the behaviour of cultural institutions in the contemporary world has been the ICT revolution that has transformed the ways in which business is conducted across the board. New technologies have provided opportunities for cultural institutions to re-think the ways in which they pursue their principal objectives. Of course many of the core activities of these organisations remain unchanging – galleries still display real artworks for people to look at, theatres still present live performances in the presence of audiences. Yet even in these core functions improvements in technology have a role to play: better lighting of artworks, better acoustic design in theatres, and so on. But it is the more spectacular technological developments that have opened up wholly new ways in which cultural institutions can re-imagine their relationship with audiences, with consequent implications for their business planning.

These matters are a primary focus of this research project, and we shall be returning to them in more detail below.

(iv)   *Changing concepts of value creation*: All of the above drivers of change in the environment in which cultural institutions have been operating come together in affecting the ways in which the value of their services are perceived and represented. For example, a heightened concern with the changing needs of consumers has led to an interest in assessing customer value, whilst government pressure towards a clearer articulation of public value creation has encouraged institutions to re-interpret the ways in which they account for their performance to funding bodies. These developments have occasionally generated some controversy as, for example, in the debate about the relative emphasis on intrinsic and instrumental value in justifying public support for the arts (Holden, 2004; Bakhshi, Freeman and Hitchen, 2009), a matter to which we shall return below. In a creative economy context, a useful way to represent the value produced by cultural institutions is to distinguish between the economic value their activities generate, measured in both market and non-market terms, and the cultural value of their output assessed according to appropriate artistic and cultural criteria.

Digital technologies in particular open up new possibilities for arts and cultural organisations to exploit their cultural assets and create more value, whether that takes the form of art galleries and museums reaching new audiences by digitising their

collections and archives, or performing arts organisations broadening audience reach through distributing their performances in digital formats.

A fundamental challenge for arts organisations in these cases is to use intellectual property rights, and copyright in particular, to maximise the economic returns from their artworks (note the ongoing dispute between the National Portrait Gallery (NPG) and Wikimedia over the latter's unauthorised use of digitised images of works that are under the NPG's copyright), and, in cases where copyright is held by others, to clear those rights needed to distribute their content in new ways.

Ivey (2009) discusses how entrepreneurs like Bill Gates long ago identified the potential for digitisation, and the growing demand for media content built around cultural assets, to create economic value out of collected arts works and archived content. Gates's intellectual-property-asset company, Corbis, at the onset of the internet age, secured exclusive digital rights to collections including the National Gallery in London and the Philadelphia Museum of Art at bargain prices. The implication is that arts and cultural institutions must look hard at their intellectual property assets and ask whether there are new opportunities to exploit them in the digital age.

3.   Innovation in cultural institutions: what do we know?

The aim of this research project as described in the first section above is to examine the concept of innovation as it relates to cultural institutions. We identified four aspects of innovation that might be pursued by cultural institutions across the creative arts:

- innovation in extending audience reach
- innovation in artform development
- innovation in value creation
- innovation in business management

There exists a range of studies that address one or other of these questions. In this section we provide a critical overview of some significant contributions to this field, assembled according to the above definitional framework.

Innovation in extending audience reach

What is meant by 'extending the audience reach' for a cultural institution such as a theatre or gallery? This concept can be interpreted in three ways (based on McCarthy and Jinnett, 2001):

- audience *broadening*, i.e. capturing a larger share of the population segment known to be traditional participants but who currently do not attend;

- audience *deepening*, i.e. intensifying current participants' level of involvement measured, for example, by the number of attendances per individual per year, or by the degree of audience engagement – active as well as passive – with the artform itself; and

- audience *diversifying*, i.e. attracting new groups of consumers who would not otherwise attend.

An avenue for innovation that could address all three directions for extending audiences is the use of marketing methods to find new ways of presenting the institution's product. Since institutions compete with other cultural and entertainment activities on which customers can spend their time and money, the attractiveness with which a particular institution's product is marketed can improve competitive advantage (Andreasen and Kotler, 2002; McNichol, 2007). Some arts organisations operate in a monopolistically-competitive environment where non-price competition becomes an important element in business strategy. An example is symphony orchestras and other music ensembles in large metropolitan centres. Such organisations are likely to seek novel methods for the packaging and selling of their output as a means of product differentiation in a competitive market.

A trend in the marketing focus of arts organisations can be observed over the last decade or so away from product development towards audience-based strategies. Such strategies may involve transaction marketing (building new audiences) or relationship marketing (building stronger relationships with existing audiences). Rentschler *et al.* (2002) investigate the latter, pointing to ways in which the loyalty of repeat customers can be retained. However, too strong an emphasis on customer

orientation in the marketing activities of arts organisations could deflect attention from potentially more useful marketing orientations such as towards competition or product improvements. Indeed Voss and Voss (2000) cast doubt on customer orientation as a successful marketing strategy for non-profit theatre companies; they argue that when there are non-profit goals and high rates of intangible and artistic innovation, customers may not be able to articulate their preferences, leading them to rely on the product expertise of the artist to inform and challenge them.

Innovation in the means towards diversification of audiences involves the inventing of new programs and the fostering of new partnerships aimed at broadening attendance at theatres, concert halls and galleries beyond the traditional cultural consumer towards a wider range of social and economic groups, including new immigrants, youth groups, ethnically diverse communities and so on. Grams and Farrell (2008) document the experience in this regard of a number of non-profit arts organisations in the US, showing that long-term efforts to develop audience diversity are more productive than short-term activities. They argue that extending an organisation's audience reach into new territory is not necessarily a simple matter, and is likely to require the establishment of some sort of infrastructure within the organisation with a specific remit in this area.

Notwithstanding the sorts of opportunities discussed above, perhaps the most radical avenue for innovation in extending audiences is in the use of new technologies. In the first instance this might involve simply the use of the internet to provide service and product information, sell tickets, promote new activities and so on. For example, national museums in the UK have used their websites effectively to increase access and develop audiences (Loran, 2005). A recent report by the Arts Council, England (2009c) indicates that 94 per cent of all 869 of the Council's Regularly Funded Organisations (RFOs) have websites with either basic or 'rich' marketing functionality. However, the more profound innovations come through the far-reaching potential of new communications technologies that are constantly being introduced. There are three ICT features that are drivers of this sort of innovation:

- *interactivity* – the potential to provide for two-way communication between the provider (such as a museum or gallery) and the audience, for example through

arts-organisation websites that allow users to mix their own music content or to produce their own artwork online (Hughes and Lang, 2006; Knell, 2006);

- *connectivity* – the capacity of the internet to enable direct and high-frequency communication between and amongst providers and users of cultural services, for example cultural institutions creating online resources to enhance the experience of audiences for 'live' artforms, or social networking sites like Facebook or Twitter which enable consumers and audiences to share their critical reactions with both arts organisations and each other (Arts Council, 2009c);

- *convergence* – audiences can access information wherever they are and using whatever device is convenient and appropriate, for example downloading mp3 and mp4 multimedia arts content to handheld devices from arts organisation websites or third-party websites such as iTunes, or viewing live performances of theatre, opera and music at their local digital cinemas.

These three characteristics combine to open up enormous possibilities for innovation in the ways in which cultural institutions relate to existing audiences and extend their reach to new groups of consumers. Central to such strategies is a re-orientation of the focus away from product-centric towards experience-centric innovation (Sigala, 2005a); value is created through co-created experiences in which the operator (e.g. a museum), the visitor and the community of visitors take part. To implement such innovative strategies managers must shift their focus from the product- or service-space to the experience-space as the locus of innovation.

The Arts Council's study of its RFOs that we mentioned above indicates that the arts and cultural sector has a long way to go in this regard: it finds that only 4 per cent of RFOs have websites that can be regarded as standalone online resources for audiences, as opposed to marketing websites for their bricks and mortar activities (Arts Council, 2009c). There is some variation across art forms, with 9 per cent of visual arts organisations having such standalone websites compared with only 2 per cent of theatres.

In the case of museums' and galleries' physical interaction with their visitors, the transition from mass presentation of information to individually-tailored experiences is a gradual one. An important line of development has been to convert standardised interpretation materials such as wall texts into personalised presentations using mobile hand-held devices. The technology for conveying such information has advanced rapidly with the introduction of specialised audio functions, speech-activated devices, and so on (Stock and Zancanaro, 2002; Rocchi *et al.*, 2004). It can be suggested that such developments can transform the interpretive and educational function of the traditional docent or tour guide role to what has been termed a 'cyberdocent' (Rayward and Twidale, 1999), a virtual guide who takes on not just the informative and instructional activities of its human equivalent, but also new forms of expression enabled by the additional functionality that the technology provides.

In fact the possibility of a virtual guide to a real museum leads directly to the potential for an entirely virtual museum, which visitors attend only in cyberspace. Such a prospect clearly opens the way for extension of audience reach not just across socio-economic groups but in spatial terms as well. The requirements of online museum audiences can be summarised under two main headings (Geber, 2006):

- a demand for query-based access to known and trusted collections; and

- a need for more fluid and wide-ranging communications focussed on particular events and conversations.

These sorts of demands are being met in a variety of ways by existing museums and by new organisations devoted solely to online provision. An aspect of particular interest in this context is that of authenticity – in the online environment the nature of the visitor's learning experience and internalisation of meaning are qualitatively different from those of the 'real' visitor (Sigala, 2005b): the more 'authentic' the online experience becomes, the greater the potential for the cannibalisation effects on the live artform discussed earlier.

Yet the potential for new digital technologies to impact on arts and cultural organisations goes beyond the internet. In the case of the performing arts like theatre and opera, for example, the use of new technologies as an innovative means of

extending audiences has traditionally involved repackaging performances in recorded form, a process that has been going on for many years. More recent technological developments have enabled such innovations as high-quality broadcast or streamed transmission of live performances in real time in alternative formats and in widely diversified presentation venues. We discuss the use of new technologies in art galleries and the theatre further in Section 5 below, and will be examining the *NT Live* experiment and Tate Online as detailed case studies as a part of this research project.

Innovation in extending the artform

This type of innovation relates to the development of new work that has at least the potential to influence artistic trends and perhaps lead them in new directions. In the theatre this means not only producing new or previously-unperformed plays but also developing new approaches to the performance of existing works. In the case of art museums, extending the artform refers mainly to the programming of contemporary art in all its forms, together with the educational and informational functions that assist consumers in their understanding of new trends in art.

Innovation in this area can take the form of product portfolio innovation, meaning changes in the mix of works presented, and radical product innovation that introduces entirely new works. Organisations can innovate along a path that is consistent with 'business as usual' by incremental means, a strategy likely to suit the preferences of existing customers. Although current audiences may eventually accept radical new works, Voss *et al.* (2006) suggest that this sort of innovation tends to target emerging rather than existing market needs. However it is done, it appears that product innovation of the 'content-creation' type is more common and widespread in the cultural industries than is innovation in the economy at large (Handke, 2008, Stoneman, 2009).

What constitutes artistic innovation in the sense defined here? Castaner and Campos (2002) define it as the programming of an activity that radically departs from existing art conventions, whether locally or globally. This enables innovation to be distinguished from mere newness. Such innovation may relate to content and/or to form; in the case of content it refers to the programming of entirely new work, in the case of form it refers to the mode of presentation, interpretation etc. In examining the factors affecting

innovation within arts organisations, Castaner and Campos draw attention to the fact that artist-led firms are more likely to engage in product- based innovation than management-led firms.

It is well known that riskiness acts as a constraint on the programming of new work (Di Maggio and Sternberg 1988). Riskiness in this context refers to the so-called 'nobody-knows' property (Caves 2000) of cultural production, where the likely demand for new products is uncertain and unpredictable. Thus, a gallery contemplating mounting an exhibition of works by a controversial artist or a theatre company programming a newly-written play must take account of the uncertain effect on attendances, revenues etc. that such initiatives are likely to entail, and may be persuaded to go with something safer.

A question arises as to the influence that public funding may have on arts organisations contemplating taking these sorts of risks. On the one hand it may be that governments may explicitly or implicitly prefer safety over originality in the activities they support and the organisation will respond accordingly; on the other hand such funding may serve to relieve the financial pressure on recipient organisations, making them *more* willing to take risks. Pierce (2000) examines this issue in the context of American opera companies, finding that amongst these organisations over the period studied, local government funding tended to encourage conventionality, whereas federal funding did the opposite. In the end the problem for any organisation is one of balance, portrayed by McMaster (2008) as one of balancing risk against the pursuit of excellence.

Innovation in value creation

Cultural institutions create value in many ways and for many beneficiaries, not only for those people who consume their services directly but also in a broader sense for society at large. The standard approach to interpreting such value within economics is to distinguish between *use value* and *non-use value*. The former refers to the benefit that consumers derive from their own consumption of the goods and services produced; a person attending a theatre performance, for example, enjoys a private benefit whose value to them, in financial terms, is at least as great as the price they paid for the ticket. Non-use value relates to the wider community benefits that cultural

institutions may provide; for example, people may value the knowledge that such organisations exist in our society even if they don't attend them themselves (so-called *existence value*). The monetary value of these sorts of non-market benefits can be assessed using techniques such as contingent valuation (CV) methods to find out how much people are willing to pay for the public-good benefits they receive.

Over the years arts organisations in many countries have undertaken economic impact studies in order to demonstrate in hard financial terms the contribution that the organisation makes to the local, regional or national economy (Bille and Schulze, 2006). Many such studies have been subject to criticism on the grounds that they have tended to overstate the economic benefits, for example by counting gross rather than net effects, or by including multiplier effects where this is not warranted (Seaman, 1987; Reeves, 2001, Sterngold, 2004).

It is also the case that most such studies concentrate on the impact of direct production and consumption expenditures and ignore the non-use value that is generated by arts and cultural activity. Yet, in terms of overall value creation measured in economic terms, the non-use values are quite likely to be very significant (Scott, 2006). For example, in a study of public libraries in Norway, Aabø and Strand (2004) found that more than half of the total value created by these institutions was attributable to non-market effects, with only 40 percent of their total value attributable to direct use. In 2003, the British Library used CV techniques to estimate that it provides over £363 million in value each year, the bulk of which is value enjoyed by non-users. This is around 4.4 times the level of its annual public funding (Pung, Clarke and Patten, 2004). In 2005, a CV study of museum, library and archive services in Bolton found that users and non-users valued the services at £10.4 million, 1.6 times the value of their public funding (Jura Consultants, 2005).

The interpretation of value created by cultural enterprises has been placed into a wider context in recent years as a result of the promulgation of the concept of public value as a means of representing the value of publicly-accountable organisations (Keaney, 2006). Pressure has mounted on museums, galleries and performing companies to demonstrate the social impacts they have on their communities and on society at large (Belfiore, 2004). In particular, the concept of arts organisations as agents of social inclusion has gained a lot of acceptance. It is clear that the social value created by such organisations is not adequately measured by market value (Nicholls, 2007), and

so alternative means of calibrating social effects have been sought. A number of studies have been undertaken that are aimed at assessing how audiences for the performing arts or visitors to museums and galleries interpret their experience in a social or community context. For example, Newman and McLean (2004) looked at the museum services of two local authorities in the UK which were active in using museums as a vehicle for enhancing social inclusion; they found evidence pointing to a positive role for museums and galleries in ameliorating the effects of social exclusion on certain groups in the community.

Yet despite the clear role that cultural facilities play in building social capital, disquiet has been expressed that emphasis on the instrumental functions of arts and cultural organisations tends to overshadow these organisations' fundamental purpose, broadly expressible as the creation of cultural value. Debate stimulated by the publication of John Holden's paper on *Capturing Cultural Value* for Demos (Holden, 2004) raised questions about the growing prominence of instrumental criteria for public-funding allocations, at the expense of the essential artistic objectives of those organisations seeking support. This discussion was also raised in the context of cultural policy in the United States in the RAND Corporation's report on public funding for the arts in America (McCarthy *et al.*, 2004). In this study, the authors identified the intrinsic value of the arts as the missing link in assessing the value of artistic activities.

Our review of the evolution of concepts of the value generated by arts organisations suggests that there is a requirement for some fresh thinking about the interpretation and representation of the creation of value by such enterprises. At an institutional level, internal criteria for judging the value of cultural organisations need to be adapted to the new environments in which such institutions find themselves at the beginning of the twenty-first century. Falk and Dierking (2008), for example, argue that such criteria need to be framed in terms of service to the specific needs of audiences, while maximising the organisation's 'flexibility and ingenuity' in relating to internal and external stakeholders.

More broadly, however, a need exists for a clearer understanding of value creation by cultural organisations across the board. Of course the economic contribution of these organisations to incomes and employment at both national and local levels remains a very important dimension to the value they create, as do the various social benefits that

they undeniably generate. And economic measures such as consumer surplus (in the case of value that is mediated in markets and where consumer demand can be observed) and willingness-to-pay (in the case of non-market benefits) are also closely related to the intrinsic value of the art (Bakhshi, Freeman and Hitchen, 2009).

But we must recognise that a complete picture of intrinsic value requires a reassertion of the importance of the cultural value that is essential to their existence and operations, a process that will necessitate sharper means of measuring and representing the ways in which the artistic and cultural objectives of cultural institutions are achieved (Brown and Wolf, 2007, Hutter and Throsby, 2008). Such endeavours may expose more clearly the sorts of tensions between economic and cultural imperatives to which Frey (2008) alludes. These are issues that need to be addressed, so that balanced policy strategies, both for funding agencies and for recipient institutions, can be found.

The UK's tight public spending environment in coming years will surely increase further the pressure on arts and cultural institutions to demonstrate the value they create. Insofar as the internet and other digital technologies create opportunities for these organisations to generate more public value through expanding audience reach, there are strong reasons why these organisations should invest in using innovative valuation techniques, and in collecting the data needed to apply them.

Innovation in business management

The changing environment in which cultural institutions operate that we have discussed above has led to the development of new business models. Greffe (2008) points to digitisation, new consumption spaces and changes in the means of cultural production as leading to the emergence of very different business models from those that were characteristic of traditional forms of artistic organisation. These developments parallel the ways in which new business models are being put forward and adopted in the wider spheres of commerce and industry (Johnson *et al.*, 2008).

In the cultural arena, impetus towards the search for new business models arises from both the demand and the supply side. In regard to demand, the shift of focus from an

organisation-centred to a more customer-centred orientation in business strategy that we noted earlier (Andreasen and Kotler, 2002; McNichol, 2005) leads to new ways of interpreting value within the business model, promoting in particular an approach that emphasises a bottom-up rather than a top-down view of the consumer experience. This move parallels a trend in cultural organisations towards audience development rather than product development in directing their resource allocation decisions (Rentschler *et al.*, 2002). Such a move has been described by Weil (1999) as a shift from being about *something* to being about *somebody*.

On the supply side it is primarily the advent of new technologies that have prompted the growth of interest in restructuring traditional business models. The ways in which cultural institutions identify their customers and their products, generate value, attract and keep their consumers and define the services they perform have all been affected by the digital revolution. In the case of museums, for example, Minghetti *et al.* (2001) discuss the re-engineering of the role of museums in the cultural value chain; the engagement of such organisations with new technologies has evolved from the provision simply of an electronic brochure to their functioning as a multi-media platform serving a much wider community of potential visitors. Indeed the use of the value chain as an appropriate concept for interpreting business models of cultural organisations may itself be changing in the new digital environment. Keeble (2008), for example, suggests that in this environment the idea of a value *network* is a more appropriate representation of the interrelationships between firms and individuals involved in the supply of cultural goods and services.

It is apparent that in this final area of innovation in cultural institutions that we have identified, all of the other three areas are drawn together. If such organisations are to pursue innovative strategies for audience development, for advancing the artform and for representing value, they will need to adapt their traditional business models to deal with these new strategic directions. The ways in which our two case-study institutions are confronting these issues, and the lessons that can be learned for further development, are a primary concern of this research.

4. Innovative use of new technologies in art galleries, museums and the theatre

In this section we review some of the innovative ways in which art galleries and theatre companies around the world are using new technologies as a means of extending audiences and creating new experiences for consumers.

Art galleries and museums

The use of new technologies by museums and galleries took off during the 1990s and grew rapidly during that decade. In 1995 the Virtual Library of Museums listed 120 museum websites worldwide, and a year later this number had grown to 400 (Keene 1997). Originally the websites simply duplicated familiar museum products, providing information about exhibitions, events, opening times, etc.. Development was constrained by cost, poor visual quality and lack of technical sophistication (Paolini *et al.* 1999: 27).

After the turn of the millennium the interest in and use of new technologies has grown rapidly, giving rise to the terms 'museum without walls', 'post-museum' and 'virtual museum' (Hooper-Greenhill 2000: 152-153). Nowadays museums use new technologies for a range of functions both in the museum itself and in the virtual worldwide web. These functions include:

In the physical museum

- Multimedia tours
- Interactive kiosks
- Simulation and virtual reality experiences
- Wireless connectivity enabling live feeding of information and tools
- Sound, laser and light shows
- IMAX presentations and 'theme-park-like' attractions

On the web

- Online access to collections and databases
- Online exhibitions (text, image, audiovisual)
- Virtual exhibitions (including 360-degree room views)
- Virtual museums (including Second Life), using real and imaginary exhibition and gallery spaces
- Downloadable and streamed multimedia content (audio, video, podcasts)
- Interactive gallery maps
- Dedicated sites, games and play spaces for children and young people

- Personalised spaces – creating own favourites and tagging objects
- Social media networks (blogs, Facebook, Twitter, Flikr, YouTube)
- Shopping online (exhibition tickets, merchandise).

Some of these applications are not especially new, having been in existence for some time; however, their functionality is constantly being enhanced as the technology improves. New technologies still at the experimental stage of development in their use by art museums at the present time include:

- Federated content – shared digital media content between institutions which is designed to be self-managing to support reporting and rights-management in a peer-to-peer network. Examples of sites doing this are:

  - Artbabble (www.artbabble.org) and,

  - Smarthistory (www.smarthistory.org).

- Mobile augmented reality – using camera-equipped mobile devices to take photographs of objects and receive immediate overlays of information. For example see:

  - The Nokia Research Center (http://research.nokia.com/research/projects/mara/index.html)

  - The emergence of augmented reality (http://futureexploration.net/blog/2009/06/the_emergence_of_mobile_augmen.html

As noted above, a number of art museums now use virtual tours and virtual exhibitions, involving a simulation of an actual physical visit to a real museum space where the 'visitor' can perceive both the physical structure of the museum and/or the actual location of exhibitions within it. It is an 'immersive' experience generally conveyed via a computer animated or real-time 360-degree panorama or video feed, supplemented by other digital museum features. Box 1 in Annex 1 gives some examples of art museums in different countries which provide virtual access to all or part of their permanent collection. Box 2 summarises the extent to which these galleries also provide online tours of exhibitions which they mount.

Theatre

Digital technologies are being used in several different ways by theatre companies worldwide in their everyday operations and in the process of theatrical production. The

first and most widespread is the use of the company's website as a means of providing information about shows, access to the theatre, ticket availability and prices, and so on. Online booking systems are now in almost universal use. Theatre company websites may also be used to provide behind-the-scenes interviews, glimpses of rehearsals, etc.

Secondly, theatre practitioners are using a range of new technologies in theatre production itself. Increasingly directors and designers mounting plays for the live stage are employing special effects, holograms and other audiovisual technologies in their work.

The third application of new technologies in the performing arts is the recent move towards the live broadcast of productions to television, cinema or online audiences. Whilst the audiovisual recording of theatre productions has been in place for some time, enabling the selling of videos, DVDs etc. of productions, or their showing on television, the emphasis on live transmission is more recent. It has evolved as technology itself has evolved, enabling high-definition high-fidelity transmission via satellite or the web to audiences. The first live theatre broadcast to television on a large scale in recent times was the live screening on BBC Four in September 2003 of a performance of *Richard II* from Shakespeare's Globe Theatre in London. This has now been followed by the National Theatre's much larger *NT Live* project currently underway which is being analysed in detail as part of this research project.

The broadcast of live performances of opera into cinemas and online has been around for the past few years. The Metropolitan Opera first transmitted performances into movie theatres in 2006 and continues to do this today, now with the use of high definition. In 2007, the San Francisco Opera followed suit. Since 2008, Arts Alliance Media have similarly been distributing opera into cinemas either live by satellite or recorded in venues, including the first ever choral performance Handel's 'Messiah' broadcast across cinemas in the UK and Europe on Palm Sunday 2008, and operas from Covent Garden (www.artsalliancemedia.com/Opera/htm).   Symphony orchestras, too, can utilise this technology. An example is the Berlin Philharmonic's Digital Concert Hall project, whereby concerts are streamed live or made available as video on demand on the web, accessible on payment for a 'ticket' (www.berliner-philharmoniker.de/en/media/digital-concert-hall).

Finally in this review of new technologies in the theatre, we turn to some more experimental innovations still largely in a developmental phase. Some of these developments are exploring the use of virtual realities and other technologies in theatre production. For example, the Pilot Theatre company based at York Theatre Royal has built a production of a play on MySpace, and have a theatre hub in Second Life. Another example is the 'Adding Machine' project at Bradley University in Illinois which in March 2007 merged real-time performances with the virtual to put actors from Florida and Canada on the stage in Illinois without their having to leave their university campuses. The production also involved virtual scenery, broadcast and recorded video, and avatar performers (http://addingmachine.bradley.edu/).

A number of organisations and academic units are actively involved with the development of new technologies for the theatre, including TAPRA (Theatre and Performance Research Association) in the UK; the US and Canadian Institutes of Theatre Technology; the Gertrude Stein Repertory Theatre in New York; and the Conservatory Theatre and its partners in Florida, Illinois and Canada. It is apparent that there is a great deal of potential for new technology applications in the theatre, but these are still very much in their infancy. As means towards extending the theatrical artform, these sorts of innovations may however play a significant role in the future.

5.   The Tate and the National Theatre

Both of the organisations that are the case-studies for this research project are major public cultural institutions that are known and respected throughout the world for their standing in their respective artforms. Both play an essential role in maintaining and celebrating great artistic traditions. But they are not only concerned with the arts of the past; they see themselves as leaders in promoting new work that will provide the new directions in artform development for the future. Both are also active in extending appreciation of the arts in the community. In this section we outline some of the initiatives and innovative practices that the two organisations undertake in these respects.

The Tate

The Tate consists of four separate venues, the original gallery on Millbank in London (now Tate Britain), and galleries in Liverpool (opened in 1988), St Ives (opened in 1993), and a second site in London, Tate Modern (opened in 2000). Reference to 'the Tate' in this report refers to the overall organisation comprising all four galleries.

The essential mission of the Tate is to 'increase public knowledge, understanding and appreciation' of British and international art. Pursuit of this mission has always been interpreted as involving the first two types of innovation that we are considering, namely finding new ways of broadening and deepening the audiences for art, and advancing the artform by fostering the best in contemporary art. Underlying these objectives has been constant attention to the other aspects of innovation that we have identified, i.e. a continuing re-examination of the notion of value creation, and an awareness of the need for forward-looking business strategies in the planning and operation of the galleries' various activities.

(i)   *Audience development*

Two of the Tate's principal objectives relate to expanding audience reach by addressing audiences beyond the immediate visitors to its four galleries, and broadening the audience appeal, for example through improving the quality of visitor experience. A number of programs specifically target new audiences, especially young people, families, and visitors who are attending for the first time.

An interview with Will Gompertz, until recently the Director of Tate Media, published in Advertising Age's *Creativity*, illuminates thinking on reaching new audiences:

> Young audiences are used to interacting with content in a way older groups aren't. … we live in an events culture. Permanent collections are free and anybody can come in and enjoy them. They're always there, so they can appear not as exciting as the latest exhibition – we had to bring some of that excitement and contemporary relevance to the permanent displays (Diaz, 2007).

The use of new technologies has been an important avenue for improving the quality of visitor experience within the galleries. For example in 2002 and 2003, Tate Modern was the first museum to pilot Multimedia Tour Systems (MMT) using handheld computers or Personal Digital Assistants (PDAs) on a wireless network in the galleries (Proctor and Burton, 2004). The MMT provides background information on displayed works – in the form of video, still images, and audio, with content such as artists discussing their work – and interactive screens allowing visitors to individualise the content to his or her own interest and pace. Wireless allows for messages and alerts to be sent to users when upcoming talks, films, or programmed activities are about to start. Despite the attractiveness of such devices for enhancing the gallery experience, however, uptake to date has been relatively low for the main collection, somewhat more for devices available for special exhibitions. Nevertheless the Tate remains committed to further development of such applications in line with the world-wide trend towards personalising and individualising the gallery experience which we noted earlier.

One of the main ways in which the Tate interacts with its audience, and reaches out to new audiences, is via its website (Rellie, 2004). In common with other major art galleries and museums around the world, the Tate brand has become recognisable through its web presence. Since its launch in 1998, use of the website has grown continually and it is now estimated to attract over 18 million visits per year. The site is rich in content, with many opportunities for visitors to access information in a variety of formats. The development of the website has been much more about extending the Tate's range, and has not been exclusively driven by revenue streams. Interaction with other websites such as iTunes and YouTube has extended the potential reach of the Tate towards a wide range of potential new audiences.

An important aspect of the use of new information technologies in the Tate is its application to the archiving function of the gallery. Most obviously this relates to the digitisation of the collection, which has been an aspect of the registration, cataloguing and information retrieval system that has been in place for some time. More recently, the use of methods for recording an exhibition by means such as a virtual tour has been introduced, enabling a permanent record of the show to be made that preserves the detail of the exhibition in perpetuity and provides an information source that is complementary to the printed catalogue.

(ii)   *Extending the artform*

The boundaries of contemporary art are expanded through the work of innovative artists who are constantly exploring new forms of artistic expression. The Tate supports such artists by showing their work and encouraging the appreciation and understanding of it; the Turner Prize is one highly-visible way in which the Tate provides a focus for a critical public assessment of current trends in contemporary art. New technologies used as innovative means of artistic expression figure prominently in these trends – a number of artists shown in exhibitions or acquired for the collection are working with video, sound and mixed media of various sorts, moving beyond traditional modes of practice.

More generally the Tate's commitment to extending the artform can be seen in the degree to which it programs exhibitions of contemporary art in its two London and two regional galleries. Over the period 2003–2007 in the London galleries, for example, 75 special exhibitions (for which an entry fee was charged) were mounted, of which 33 (44 percent) were classified as contemporary, 24 (33 percent) were modern, and 18 (24 percent) were historical (Annex 2, Table 1). Shows of contemporary art on average enjoyed slightly longer runs, and the mean entry price for contemporary exhibitions was about 25 percent lower than for other types of show. Analysis of data for the different shows indicates that exhibitions of art in the modern category generated the highest daily attendances on average (just over 1,500 visitors per day), followed by historical (1,250 per day) and contemporary shows (just over 800). Given that contemporary art is clearly a more risky proposition than historical or modern exhibitions, with lower revenue potential, the extent to which the Tate programmes contemporary shows confirms the strength of the gallery's commitment to contemporary art as an essential aspect of its mission.

(iii)   *Value creation*

The recent upsurge of interest in notions of public value is reflected in the re-examination of value creation within publicly-funded cultural institutions over the past few years, and the Tate is no exception. The Tate's board and senior management recognise that public value relates not just to people coming through the door –

otherwise only blockbusters would be mounted so that aggregate attendance numbers are maximised – but rather the gallery has a responsibility to a variety of stakeholders, including: living artists; existing and potential audiences; corporate and private sponsors and benefactors; children and young people through the provision of educational programs; future generations through the safeguarding of the collection; and society at large through the public interest in maintaining the strength and vitality of a leading cultural institution.

The provision of public funding carries with it an obligation to account for the various aspects of value the gallery creates. Since it is necessary to involve the public in defining outcomes to be achieved and in providing feedback on their achievement, the Tate collects a range of statistics and other information to monitor its success and to identify shortcomings. Such a process provides leads in due course to the development of new avenues for value generation, in line with good innovative practice.

(iv)   *New business models*

It is the view of the Tate's management that a cultural institution that embraces innovative art must also look to innovative business models. In other words, it is considered essential to link the art innovation to financial and operational innovation, reflecting a more general conviction that it is not possible to have a sustainable arts organisation without a viable business model. The present environment within which the gallery operates is one of rapid change and considerable challenge both on the artistic front and in regard to its business strategy. Importantly, keeping the business model up-to-date has involved a re-structuring of revenue sources to enhance traditional revenue streams which rely on long-standing goodwill and brand recognition, but also to capitalise on these strengths through finding new ways of raising earned revenue. This sort of strategy entails a re-orientation of the business model over time, including towards finding new means of marketing content – publishing in a variety of media, merchandising, production and sale of film and other audio-visual material, and so on.

Another aspect of business model development that has been important for the Tate has been the promotion of new ways of relating to sponsors, donors, corporate partners and individual benefactors. In dealing with potential sponsors, for example, the

Tate undertakes impact studies in advance to show corporates what they can expect in terms of benefits arising from their support. Partnership deals can yield mutual benefits. For example, the Tate's longstanding relationship with BT has enabled the introduction of technologies that would not have been possible otherwise.

Innovative, flexible and imaginative thinking is also needed in constructing particular deals to suit the needs both of the gallery and the corporate or individual donor. An example is provided by the arrangement reached in 2008 whereby Anthony d'Offay offered his collection of more than 700 works through a part-gift part-sale-at-cost agreement, to be jointly managed by the Tate and the National Galleries of Scotland. The deal was struck with the financial support of DCMS and several other organisations, enabling the works to be seen in different parts of the country in recognition of the donor's particular interest in education.

As for the future, the Tate is committed to a continuation of all the avenues of strategic innovation discussed above. In its vision statement looking towards the year 2015, the Tate sees itself, amongst other things, as becoming more global, inclusive, diverse and entrepreneurial. Its priorities include developing the collection, promoting contemporary art, expanding audiences, and enhancing operational and financial performance.

The National Theatre

The National Theatre comprises three stages: the Olivier, the Lyttelton, and a smaller, flexible space, the Cottesloe. It also maintains the NT Studio, a space for developmental work for the National's main stages and for theatre as a whole. Founded in 1963, the National moved to its present building on the South Bank in London in 1976.

The mission of the National Theatre is directed towards maintaining and re-energising the great traditions of the British stage and expanding the horizons of audiences and artists alike. Its objectives include the widening of its audience and its programming to reflect the diversity of the nation's culture. It takes a particular responsibility for the creation of new work. The National is committed to a forward-looking agenda that involves innovative practice in all four of the areas we are considering.

(i)   *Audience development*

The National Theatre employs a number of strategies to extend its audience reach both through deeper engagement with its existing audience and attracting new audiences especially from groups not traditionally regarded as regular theatre-goers. New information technologies are used extensively in the audience development area, including the usual range of services provided through the National Theatre website; the production of e-trailers (short promotional trailers for productions); short documentary films giving insight into a production or behind-the-scenes access; interactive screens in the bookshop; and the use of Tessitura Software to monitor and analyse audience characteristics and trends. To some extent these activities could be seen simply as good business practice, maintaining sound customer relations and ensuring the long-term replacement of old audiences with new ones. However, the emphasis on audience development also connects with a loftier vision, one of extending the interest in and engagement with live theatre as widely as possible in the community.

The pursuit of this vision influences the National's pricing policy. A balance has to be struck between the necessity to earn box-office revenue as a contribution towards maintaining the financial viability of the organisation, and keeping prices low enough so as not to deter audiences, especially those least able to afford a ticket. Our econometric analysis of recent price and attendance data for the three National Theatre stages, discussed in more detail in Section 6 below, indicates that the demand for full-price and web-price tickets is quite inelastic, implying that while raising these prices would cause a marginal decrease in occupancy rates, it would also increase total box-office revenue. However, the National Theatre does not raise prices even when a sell-out is possible, because as a matter of policy it does not want to limit the affordability of tickets.

One of the most successful strategies in terms of extending the audience has been the Travelex season. This initiative, where £10 tickets are offered to a number of shows, is identified by the National as a way to broaden the audience by making theatre available at prices comparable to going to the cinema. Beginning in 2002 with an offering of four plays, the Travelex season sold its millionth £10 ticket during 2009. In

addition, the National has an Entry Pass, a membership scheme for 15-19 year-olds offering £5 tickets to encourage attendance by this demographic.

The National Theatre aims to reflect in its repertoire the diversity of the nation's culture, which can also be seen as a means towards attracting a more diverse audience to the theatre. A look at the repertoire over recent years indicates the programming of a number of plays that reflect a culturally diverse Britain, including Roy William's *Sing Yer Heart Out for the Lads* performed in 2002, Kwame Kwei-Armah's plays *Elmina's Kitchen* in 2003 and *Fix Up* in 2005, and Ayub Khan-Din's *Rafta, Rafta…* performed in 2008. The theatre's 2008 *Annual Report* notes that *Rafta, Rafta…* 'drew South Asian audiences in numbers not previously seen' at the National.

As noted above, the NT has been using its website as a means of extending its contact with existing patrons and reaching new audiences. In addition to the usual information and booking services, the site features a section called *Discover: Online* (www.nationaltheatre.org.uk/discover), where it is possible to have an online tour of the theatre, view information on current performances (such as videos of actors discussing the play), go backstage, and download resource packs for teachers and students on past plays. In addition, this facility is linked with the website *StageWork* (www.stagework.org), designed for students in conjunction with the DCMS, with extensive resources for teachers related to the school curriculum.

A further avenue for engaging the community is via the development of the National Theatre's interior and exterior spaces as a cultural centre where a variety of attractions and activities are mounted throughout the year that are enjoyed by a wide range of people who may not be attending an actual performance. The National's success in engaging the public at large in the use of its facilities as a cultural centre provides an example to other organisations with suitable buildings and surrounding spaces to develop as an arts-based community resource.

Perhaps the most significant 'innovation' in expanding the audience reach undertaken by the National Theatre in recent times is the *NT Live* project. This initiative involves satellite distribution of a live performance of a play to cinemas throughout the UK and abroad. It is expected not just to expand audience numbers but also to draw into the theatre a range of people who do not or cannot attend performances in the theatre

itself. This project is used as a case-study in this research, and is discussed further below.

(ii)   *Extending the artform*

Analysis of the National Theatre's repertoire across its three stages for the approximately five-year period April 2004 to January 2009 demonstrates the importance the National attaches to presenting new work; over this period more than half (56 percent) of the 116 plays presented were written since the year 2000 (Annex 2, Table 3). An essential contributor to the National's capacity to produce new work is its use of the repertory system which enables up to seven or eight productions to be running in its three spaces at a given time.

Innovation in extending theatrical practice is the rationale for the existence of the NT Studio which acts as a developmental laboratory not just for the National but for theatre more widely. The Studio provides opportunities for writing, directing and acting talent that may go on to work in the main stages or in the industry. Work at the cutting edge of the artform is encouraged, including exploration of the use of new technologies in sound, film and video. About 15–20 percent of the new productions developed in the Studio transfer to the main National Theatre stages.

Of course presenting new work can be risky. A case in point is the production of *Jerry Springer the Opera*. This work began at the Battersea Arts Centre as a twenty-minute performance. It was developed and performed at the Edinburgh Fringe Festival, and then came to the National Theatre in April 2003. At the time, the National's decision to open the season with a new piece of writing was seen as a considerable artistic risk (Dempster, 2006). The show went on to considerable acclaim and subsequently transferred to the West End, New York and beyond.

The Artistic Director of the National Theatre describes theatre as an 'irreducibly ancient' artform – although there is constant innovation in content and delivery, the fundamental connection between live performers and a live audience remains the same. This acts as both a constraint and a challenge for theatrical innovation, a challenge to which the National has responded very strongly through its focus on the presentation of new work and the encouragement of new talent. Given the risks

associated with this sort of innovation, it is not surprising that it is little in evidence in the commercial theatre, and it remains for the subsidised sector, in which the National Theatre plays a leading role, to assume a significant responsibility for ensuring that the artform continues to develop.

(iii)   *Value creation*

The interpretation of public value in an assessment of the work of publicly-subsidised performing arts companies has a number of facets. Importantly value creation has to do with the two dimensions discussed above: the building of audiences and the advancement of artistic practice. As we have noted, the National Theatre gives these forms of value prominence in its mission statement and devotes considerable resources to a continual search for innovative ways to pursue them. In addition the generation of public value through education should not be overlooked.

At a more general level the National Theatre creates value for the theatre industry and the theatrical profession at large. Creative artists of all sorts who are given the opportunity to develop their talents at the National go on to work in the wider commercial and non-commercial theatre, film and television industries. Sometimes they return to the National Theatre to work after stellar careers outside. This constant fluidity in the relationship between subsidised and commercial performing arts is of considerable benefit to both, a benefit however that remains as yet largely unquantified.

Internally value is created for individual artists through the challenges the Theatre puts to them to extend themselves in an environment that is at the forefront of the theatrical profession. The challenge may be taken up in sometimes surprising ways: a director, for example, might choose to do a production in the Travelex season, accepting to work with half the budget that would be applicable to a normal season, because of the artistic challenges such a project presents.

The *NT Live* experiment offers an interesting possible source of new value creation. As well as expanding audiences, this project might well generate a new form of cultural value that can be yielded by live theatre, if audiences in the cinema have a qualitatively different artistic or aesthetic experience from that enjoyed by people in the actual theatre. Our research on this project will help to illuminate this question.

(iv)   *New business models*

As with any organisation, business models in the performing arts have to move with the times. This is essential in the theatre industry if enterprises are to remain artistically and financially viable. The present environment is one to which demand and financial support remains vulnerable to unforseen events such as the global economic crisis, while at the same time there is an imperative for a leading cultural institution such as the National Theatre to remain at the front line in terms of artistic growth.

In maintaining a flexible and forward-looking business model the National's strategies can be considered under several headings. Firstly, in putting together the programme for a forthcoming season, the challenge, as with any theatre company, is to find the right ratio between works that can with reasonable confidence be looked upon as likely box-office successes and those that are more risky. There is no clear line of demarcation between these two categories, and it is always possible for risky work to become a hit and vice versa. The National Theatre is fortunate in being able to have a sufficiently large volume of work underway at any one time that the risk can be spread, and a disappointing result for one production may be able to be offset by a success with another.

Another aspect of the National's business model involves taking an entrepreneurial role in pursuing opportunities for onward marketing of National Theatre productions through such avenues as West End transfers, and in seeking other revenue-raising sources. For example, a quick-response investment fund is used to raise capital at short notice for particular projects. In addition partnerships with corporate sponsors and government agencies may enable new sources of support to be tapped. An example of a successful relationship with a funding body is the cooperative arrangements between the National Theatre and the Arts Council, England in pursuit of the Council's innovation agenda. The Council, as well as NESTA, is providing some financial support for the *NT Live* experiment.

The capacity of the National Theatre to adopt a flexible and responsive business model that is sensitive to and integrated with the artistic development of the company is greatly enhanced by its management structure. In the executive team there is a close interdependence between the functions of artistic, managerial and financial direction,

allowing a unified focus to planning. Management is relatively lean enabling quick decision-making, and there is a high degree of trust among the management personnel. In short, the National Theatre provides a good example of the sort of adaptive business model for a cultural institution that works well in encouraging innovation along all of the dimensions of innovation that we are considering in this research project.

6. Data analysis

A component of this research project has been to analyse recent data on demand for the directly-provided paid services of the two case-study institutions – admissions to exhibitions for which an entry fee is charged at the Tate's two London galleries, and sales of tickets to productions on the three stages at the National Theatre. Both organisations provided statistics on demand, prices and other variables covering the period from 2003 onwards which we have used to estimate demand functions under a variety of assumptions

Interest in quantifying demand relationships in the present project stems particularly from our concern with innovation in attracting new audiences and innovation in extending the artform. Price of entry is one of the variables that can be used to regulate demand, so a lowering of price, for example, is one means of pursuing an objective of audience expansion. Likewise programming 'new' work – exhibitions of contemporary art, production of new plays – is an important aspect of the institutions' activities in extending the respective artforms, but the demand effects are uncertain. Thus an understanding of the processes of price formation and an analysis of the effects of different influences on demand for new versus more traditional artistic experiences by consumers can help illuminate some problems and prospects in pursuing innovation in these cultural institutions. Using econometric methods we are able to study how prices are determined and the effect they have on demand when other things are held constant, and we can look specifically at the demand effects of innovative work when other influences are accounted for.

A detailed account of the data, econometric methodology, and results is contained in separate Technical Reports. Here we simply summarise some of the main findings of relevance to our discussion of innovation.

The Tate

The data supplied by the Tate covered 76 separate exhibitions in Tate Britain and Tate Modern, 38 in each, over the period 2003-2007. The data available for each exhibition comprised the following variables:

> Attendances: total (nos.)
> Attendances: full price (nos.)
> Attendances: concession price (nos.)
> Attendances: members (zero price) (nos.)
> Attendances: forecast
> Price: full price (£ per entry)
> Price: concession price (£ per entry)
> Length of run (no. of days)
> Cost of mounting the exhibition (£) comprising
> > Marketing expenditure (£)
> > Other exhibition costs (£)
> Site (Tate Britain, Tate Modern)

In addition, for each exhibition the available dataset included a number of qualitative characteristics, such as: the type of exhibition (classified according to the Tate's classification system as contemporary, modern, or historical); whether the exhibition was of a single artist (monographic) or a number of artists; and seasonal characteristics. We also gathered additional data on the amount of media attention generated by each exhibition.

Our methodological approach is firstly to estimate demand functions for gallery attendance, where the dependent variable is aggregate attendances at a given exhibition. From the consumer's viewpoint the entry price and nature of the show are variables that are taken as given in determining his or her decision as to whether or not to purchase a ticket. Thus we can propose a straightforward single-equation demand model, where demand (actual attendances) is a function of price and qualitative characteristics, to be estimated by ordinary least squares for different categories of visitors (full-price, concession price and zero-priced members).

The second aspect of our econometric modelling is to examine the decision processes by which the major parameters relating to price, length of run, production budget and perhaps other variables are determined. It seems plausible to propose that the characteristics of a forthcoming exhibition (i.e. whether it is historical, modern or contemporary, or whether it is monographic, etc.) are essentially exogenous influences. Similarly the number of days available for a given show tends to be predetermined by the slot available in the overall exhibition planning cycle. It can be proposed that these exogenous variables form part of a system in which price and other variables are endogenously determined. This is because the planning team evaluates the potential of a proposed show well in advance, and makes an estimate (within some constraints) of forecast demand on the basis of the type of art or the artist(s) that are the subject of the show and whether members of the team believe that the show is likely to be extremely popular (a 'blockbuster'), very popular, or more risky. The team then determines a ticket price and a marketing budget for the show. For exhibitions that are judged to be assured of success, a higher price is likely to be set and a larger marketing and advertising budget approved, other things being equal. It is possible to test whether the forecasts on which planning is based have been accurate predictors of actual demand.

In summarising our results, we turn first to this second aspect of our empirical investigations. Our analysis of the process of price determination within the Tate indicates that forecast demand for a forthcoming show is determined to a significant extent by the type of show, and that there is a strong relationship between the price set for an exhibition and the marketing budget allocated, in line with the proposition that more popular shows warrant a bigger spend on marketing, etc. and will be able to support a higher price. Production budgets are determined independently of the pricing decision, being influenced amongst other things by the nature of the works and where they are coming from. Prices for shows of contemporary art are set significantly lower than those for modern or historical exhibitions.

The Tate's planning procedures have proved to be quite accurate in forecasting demand – about three-quarters of the variation in actual demand is explained by the forecast. But no matter how careful the forecasting process, not everything turns out as expected. For example, media attention to exhibitions, which cannot be predicted in advance, has a positive effect on actual attendances; our results suggest that a 10 percent increase in media coverage, measured by the number of mentions, will raise

total attendances on average by between 1 and 3 percent, other things being equal – the biggest effect is for full-price attendees, the least for Tate members.

In regard to the main focus of our econometric analysis, i.e. the estimated demand functions, we note that in making their decisions, potential attendees are affected by a variety of factors, many of which – such as the weather or competition from other attractions – we do not have data for and cannot include in our modelling. Nevertheless, we *are* able to estimate the effects of price, with particular interest in whether exhibitions of contemporary art – our focus for innovation in extending the artform – are price sensitive.

Our estimated demand functions indicate that demand amongst full price attendees aggregating across all types of exhibition is approximately unit elastic, meaning that a one percent rise/fall in price, other things being equal, will cause a fall/rise in demand (total attendances) of an equivalent percentage. However, we find that elasticities differ for different types of exhibition; in particular the demand by full price visitors to exhibitions of modern or contemporary art is found to be more price sensitive than for historical shows. The estimated elasticity for attendance at both modern and contemporary shows by full price visitors is approximately -1.13, indicating that a reduction in admission price of a certain percentage for such a show would raise attendances by these visitors by a larger percentage amount (Annex 2, Table 2). For example we can calculate that, with everything else held constant, a reduction in admission price from, say, £7 to £6.50 (a reduction of about 7 percent) would raise total attendances among full price attendees by about 8 percent, and would increase total sales revenue from this source as well. Concession price attendees, on the other hand, are not particularly sensitive to price, due in part apparently to the fact that some such visitors are a 'captive market' – youth groups, school parties etc.

Other variables that influence full price attendance at a given contemporary show include the level of marketing and production expenditure allocated to the exhibition and, as noted earlier, the amount of media attention the show attracts. These additional influences also affect members to some extent, but appear to have little or no effect on the level of concession price attendances.

In our discussion of the Tate in the previous section, we noted that there may be a trade-off between the two innovation strategies of increased audience and programming new work – popular shows will attract large crowds, whereas more experimental work gets smaller attendances. It is useful to explore the dimensions of this trade-off by asking: By how much are audience numbers likely to be reduced on average if a contemporary show is programmed rather than a more traditional exhibition. For example, suppose there is a choice between programming a show of contemporary art and a modern exhibition. The proposed shows are identical in all respects (price, site, marketing expense, length of run, etc.). Predictions from our demand equations show that expected aggregate attendance and revenue at the contemporary show are likely to be up to 20 percent lower than for the modern show, the exact amount of the fall depending on the assumptions made. This example illustrates the quantitative nature of the trade-off between increasing audiences and advancing the cause of contemporary art, where the latter is interpreted as the programming of a contemporary exhibition. It reinforces the importance of a business model which is sensitive to the achievement of a balance in the pursuit of these innovation objectives.

The National Theatre

Over the period 2003–2008 the National Theatre performed 116 plays at its three theatre venues on the South Bank of London. The data available for each production comprise the following variables:

> Attendances: full price (nos.)
> Attendances: web price (nos.)
> Attendances: concession price (nos.)
> Price: full price (£ per ticket)
> Price: web price (£ per ticket)
> Price: concession price (£ per ticket)
> Length of run (no. of performances)
> Venue (Lyttelton, Olivier or Cottesloe)

Additionally, we assembled data on some qualitative characteristics for each play – in particular a classification of the play according to certain criteria. Various classifications of plays can be proposed in efforts to capture their qualitative nature – classic works, avant-garde or experimental works, musicals, comedies, etc. In this study we have put together two alternative classifications. The first assigns plays to categories based on the prominence, reputation or recognisability of the playwright, and the period in which

it was written. This enables a differentiation between 'well-known' and 'less well-known' playwrights. The former can be assigned fairly clearly to three periods: pre-1900 (e.g. Shakespeare, Chekov, Ibsen); 1900–1960 (e.g. Shaw, Tennessee Williams, Brecht); post-1960 (e.g. Stoppard, Bennett, Pinter). Lesser-known playwrights can be simply assigned as contemporary (plays performed over approximately the last 10 years) and earlier (plays performed before this time). This enables a suite of dummy variables to be defined. In our extended analysis we examine the effects of all these classifications; here we are concerned only with the classification 'Play by less-well-known playwright post 1995', to capture the most recent and innovative new writing. Over the period studied, a total of 52 productions (45 percent) fell into this category (Annex 2, Table 3).

Given the subjectivity of the 'well-known' and 'less well-known' designation, a second and more objective classification is used based simply on the date of the play's first performance. Again in the discussion here we focus on the most recent category, plays whose first performance was in the year 2000 or later. This group includes plays by both well known and lesser known playwrights. In the period studied, 65 plays (56 percent) fell into this category.

In concentrating attention on the most recently written work, we are following the common definition of innovation in the performing arts as the programming of contemporary works. For instance, DiMaggio and Stenberg (1985) quantify innovation in theatre companies as programming 'nonconformity', or the extent to which a theatre's repertoire diverges from other theatre companies. Similarly, Pierce (2000) quantifies artistic innovation in opera companies as the programming of works rarely performed by other opera companies.

We turn now to our econometric investigation of the National Theatre data. Because the sizes of the three NT venues differ, total attendances for a season, or attendances per performance, are an unsatisfactory indicator of demand. Instead we use the calculated occupancy rate, being the percentage of available seats for a given production being taken up by a paid audience, measured across the entire season. The data indicate that occupancy rates over the period studied were highest for plays by well-known post-1960 writers (around 90 percent capacity on average), lowest for lesser-known writers pre-1995 (around 80 percent). Interestingly plays by lesser-known

playwrights since 1995 – the group we have assumed to be the most 'innovative' in terms of new writing – have been somewhere in the middle (around 85 percent).

Estimates of a pricing model do not show any significant effects of the type of play on the price as determined. This is perhaps not surprising in view of the fact that the data show that mean ticket prices in all three price categories vary very little across the different qualitative classifications of plays. Accordingly, we focus here on the straight demand function results. In regard to the effect of price on demand, our results indicate an inelastic demand amongst full- and web-price ticket buyers, with an elasticity estimate of approximately -0.2 overall. This means that an increase in these ticket prices would not be expected to have a significant downward impact on demand, and would permit an increase in net sales revenue. However, as we noted in our discussion of the National's pricing strategy in the previous section, the option of setting prices to maximise revenue is not one that the theatre would adopt, as it would be inconsistent with the National's mission to keep ticket prices as affordable as possible. It can be noted that by the same token the opposite possibility – lowering prices to encourage a larger audience – is unlikely to yield significant results, at least at the margin.

Looking at the effects of the type of play on attendances, we note that how well known the playwright is has the largest impact on attendances. Plays by the contemporary 'innovative' group (less well-known, post 1995) are not popular amongst full price ticket buyers. Programming a play by this group is likely on average to lower full-price occupancy rates by around 2 percentage points, other things held constant. Nevertheless plays in this category are better supported by concession-priced attendees, perhaps because these audiences include groups who have no choice (e.g. school parties) and theatre professionals with a specific interest in new work. As with our Tate analysis above, these results illustrate in quantitative terms the trade-off between the innovation objectives of increasing audiences and of advancing the artform through the programming of new writing, again emphasising the importance of a business model calibrated to achieve an appropriately balanced outcome.

7.   Summaries of experiments, and next steps

The main empirical innovation in our research is two research experiments we are conducting with the National Theatre and the Tate. The methodological novelty, which makes our studies 'experiments', is that as researchers we have worked closely with the respective organisations in generating data which are fit for purpose – that is, to test our research questions. This contrasts with the standard approach in analysis where the researchers come in *ex post* to analyse data that more than often have been collected for completely different purposes.

Both experiments are ongoing, in that data are being collected with an eye to conducting our quantitative analysis over the coming months.

The Tate

Between 29 May and 13 September 2009 an exhibition called *Colour Chart* ran at Tate Liverpool. *Colour Chart* is a major exhibition devoted to the moment in twentieth-century art when artists began to perceive colour as 'readymade' rather than as a vehicle of spiritual or emotional content. The exhibition features the work of 42 artists including Damian Hirst, On Kawara and Jim Lambie. Over its run the exhibition attracted more than 19,000 visits (to the extent that some visitors may have made more than one visit to the exhibition this represents an upper bound on the number of unique visitors).

Tate Online features a website for the exhibition which, as well as providing the usual ticket and merchandise facilities and details about related in-gallery events, hosts a large amount of multimedia content giving information about the exhibition and the artists featured which can be either downloaded or streamed: http://www.tate.org.uk/liverpool/exhibitions/colourchart/intro.shtm (the exhibition multimedia tour can also be downloaded as an MP4 file from iTunes). The *Colour Chart* webpages also feature a number of educational resources and games geared at younger online visitors, which have proved to be their most popular pages. Last, but not least, the Tate is also collaborating with the online photo-sharing community Flickr

whereby the public can contribute their own colour monochromes to create a constantly changing colour chart. All the photographs posted are being shown on Tate Online, and 36 of the images are being used to produce a glossy Colour Chart poster, which will also be displayed at Tate Liverpool.

Over the exhibition's run at Tate Liverpool the website attracted 66,190 unique visits (again, because some online visitors are likely to have made multiple visits to the *Colour Chart* webpages this number represents an upper bound on the number of unique visitors).

Working closely with the Tate Liverpool and Tate Online teams we have collected detailed survey data on both in-person and online audience patterns for the exhibition. By conducting comparative analysis of the survey data and also direct analysis of the web traffic to the *Colour Chart* webpages we are providing answers to questions such as:

- To what extent can online content expand audiences for the Tate's work?
- What are the different ways in which arts galleries can 'monetise' the services they provide online? (To help explore this we have also embedded a 'call for action' link to a donations page in the exhibition webpages)
- What can we say about appropriate pricing strategies both in-gallery and online?
- To what extent can online services develop the artform itself?
- To what extent can online services develop new physical attendances at arts galleries?
- Is there any evidence of offsetting 'cannibalisation' effects on visits to the Gallery?

The National Theatre

On 25 June 2009, for the first time, the National Theatre in its *NT Live* experiment broadcast live by satellite its production of Ted Hughes' adaption of *Phèdre* to 73 digital cinema screens in the UK and to 210 further sites in the rest of the world. A total of 14,000 people across the UK saw that evening's production (excluding those who experienced it at the National Theatre itself). An additional 14,000 people saw it live across Europe or on the same day in North America (allowing for time zone delays).

Including those cinema audiences in other countries who saw the production at a later date, it is estimated that a staggering 50,711 people saw *Phèdre* as it was performed on June 25th. *Phèdre* is the first of four pilots under the National Theatre's *NT Live* programme.

In collaboration with the National Theatre and 35 of the participating UK cinemas we have collected detailed survey data on both NT and *NT Live* audiences for *Phèdre*. By conducting comparative analysis of theatre and cinema audiences we are addressing research questions including:

- To what extent can broadcasting live theatre productions at cinemas create new audiences for theatre?
- How large is the potentially offsetting 'cannibalisation' effect at the theatre box office?
- What pricing strategies should theatres deploy when broadcasting live productions at the cinema?
- To what extent can broadcasting live theatre productions develop the artform itself?
- To what extent can broadcasting live productions constitute sustainable new business models for theatre companies?

The survey analysis will be complemented by statistical and econometric analysis of audience postcode data for the National Theatre audiences which will give us an independent take on whether *NT Live* stimulated or cannibalised audiences for the National Theatre's performance of *Phèdre* in regions where it was broadcast at cinemas.

One of the great benefits of having worked closely with the two organisations on the data collection is that we have been able to generate much larger survey samples than is usually the case with survey-based work: over 1000 surveys apiece in the case of National Theatre and *NT Live Phèdre* cinema audiences,[3] and over 2000 (400) in the case of *Colour Chart* at Tate Online (Tate Liverpool). Our expectation is that our data analysis will generate insights into innovation which are robust enough to be of interest

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[3] We have also surveyed audiences for the second of the National Theatre's *NT Live* pilots, *All's Well That Ends Well* meaning that we can explore how sensitive are our findings to the nature of the theatre production.

to the wider performing and visual arts sector as well as the two organisations themselves.

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Annex 1

Box 1: Online access to permanent collections in selected art museums

	View all works	In-depth studies of selected works	High-quality zoom	Information about all / some of the works	Multimedia content
National Portrait Gallery, UK	√ (120,000)	√	×	√	×
The National Gallery, UK	×	√	√	√	√ (Video, audio, podcasts)
The Tate, UK	√	√	×	√	√ (Video, audio, podcasts)
Centre Georges Pompidou, Paris	√ (60,000)	√	×	√ - for selected works	√ (Video)
Musee du Louvre, Paris	√	√	×	√ (in-depth studies of select masterpieces)	√ (Video, audio, webcams)
Musee d'Orsay, Paris	√	√	×	√	×
Uffizi Gallery, Florence	√	×	×	√	×
Rijksmuseum, Amsterdam	√	√	×	√	×
The Hermitage, St.Petersburg	×	×	×	×	×
Prado Museum, Madrid	×	√	√	√	√ (Video, audio, games)
Vatican Museums, Vatican City	×	√	×	√	×
J. Paul Getty Center, Los Angeles	√	√	×	√	√ (Video, audio, games, education)
MoMA (Museum of Modern Art), NY	×	√	×	√	√ (Audio, video, interactive)
Metropolitan Museum of Art, NY	×	√	√	√	√ (Limited multimedia, although 'My Met Gallery' allows gathering of favourite works of art)
National Gallery of Art, Washington	√	√	×	√	√ (Video, audio, podcasts, interactive)
Smithsonian National Portrait Gallery, Wash. D.C.	×	√	×	√	√ (Audio, video, podcasts, educational resources)
National Art Gallery of Canada	√	√	×	√	√ (gallery 'channels' offer video and audio on themes such as artists, art techniques, and current research)
Virtual Museum of Canada	√ (770,476)	√	×	√	√
Powerhouse Museum, Sydney	√	√	√	√	(audio, video, podcasts)
Te Papa Tongarewa, Wellington	√ (150,000)	×	√	×	×

BOX 2: Online tours of collections and exhibitions in selected art museums

	(1) 360 Degree Room View	(2) Interactive gallery map	(3) Other on-line tours of gallery	(4) Online access to specific exhibitions
National Portrait Gallery, <<>>	×	√	-	×
The National Gallery, <<>>	×	√	-	×
Tate Galleries, UK	×	×	×	√
Centre Georges Pompidou, Paris	√	×	-	×
Musee du Louvre, Paris	√	√	-	√
Musee d'Orsay, Paris	×	√	-	×
Uffizi Gallery, Florence	×	√	-	×
Rijksmuseum, Amsterdam	×	×	×	×
The Hermitage, St.Petersburg	√	√	-	×
Prado Museum, Madrid	×	×	×	×
Vatican Museums, Vatican City	√	√	-	×
J. Paul Getty Center, Los Angeles	×	×	√ ('themed')	×
MoMA (Museum of Modern Art), NY	×	×	×	√
Metropolitan Museum of Art, NY	×	×	√ ('themed')	×
National Gallery of Art, Washington	×	×	√ ('themed')	×
Smithsonian National Portrait Gallery, Wash. D.C.	×	√	-	√
National Art Gallery of Canada	×	√	-	×
Virtual Museum of Canada	×	×	Virtual exhibits	√
Powerhouse Museum, Sydney	×	×	×	×
Te Papa Tongarewa, Wellington	×	×	×	×

Annex 2

Table 1 Number of exhibitions and mean ticket prices: Tate Modern and Tate Britain, 2003-2007.

	No. of shows		No of days per show			Full price			Concession price		
			Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
	no.	%	no.	no.	no.	£	£	£	£	£	£
Exhibition type											
Historical	18	24	88	68	110	9.41	6.06	11.18	7.22	4.24	9.15
Modern	24	32	93	74	116	9.50	5.93	12.17	7.23	4.25	9.73
Contemporary	33	44	95	80	124	7.28	3.65	11.13	5.76	3.65	8.32
Total	75	100	91	68	124	8.52	3.65	12.17	6.59	3.65	9.73
Site											
Tate Modern	38	50	92	68	124	8.71	5.93	12.17	6.71	4.24	9.73
Tate Britain	38	50	90	68	116	8.31	3.65	11.18	6.44	3.65	9.15
Total	76	100	91	68	124	8.51	3.65	12.17	6.58	3.65	9.73

Note: Prices are adjusted for inflation and are expressed in real terms at 2008 levels.

Table 2 Price elasticity estimates: Tate galleries

| | (1) | Type of exhibition | | |
| | | (2) | (3) | (4) |
	All exhibitions	Modern	Contemp.	Historical
Full-price attendance	-0.96**	-1.13	-1.13**	--
Concession price attendance	0.64	--	1.27	1.78*

Notes: Elasticities are derived from visitor demand equations where attendance is modelled as a function of price, marketing and production spend, and a range of qualitative variables (including whether exhibition is historical, modern or contemporary, whether or not the show is a 'blockbuster', whether the show runs over the summer months, the venue and the level of media coverage). Elasticities are derived from logarithmic estimation using total attendance (controlled for number of days). Only those elasticities are shown where the regression coefficient has a *t*-statistic > 1 in absolute terms.
* $p<.05$, ** $p<.01$, *** $p<.001$

Table 3 Number and type of theatre productions: National Theatre, 2003-2008.

	No. of productions		No. of perform-ances	No. of productions per venue					
			mean	Cottesloe		Lyttelton		Olivier	
	no.	%	no.	no.	%	no.	%	no.	%
Type									
Play by well-known playwright pre-1900	14	12	50.1	0	0	7	18	7	21
Play by well-known playwright 1900–1960	13	11	50.5	2	5	5	13	6	18
Play by well-known playwright post-1960	29	25	51.6	8	21	16	40	5	15
Play by less well-known playwright pre-1995	8	7	46.6	3	8	2	5	3	9
Play by less well-known playwright post-1995	52	45	53.4	26	67	10	25	13	38
Total	116	100	51.8	39	100	40	100	34	100
Written Category									
Play written after 2000	65	56	56.7	32	82	15	38	15	44
Play written 1900–2000	34	29	42.4	5	13	19	48	10	29
Play written before 1900	17	15	51.8	2	5	6	15	9	26
Total	116	100	51.8	39	100	40	100	34	100