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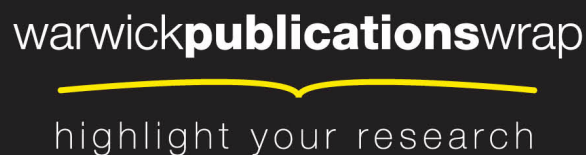
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**Digital transformation and the arts: a case study**

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Abstract
This paper considers the interaction between digital technology and cultural organisations and the challenges and opportunities this presents for practice and for policy. The paper is based on one of eight 'digital R&D' projects supported by NESTA, Arts Council England and the AHRC, designed to analyse the effects of digital innovation in UK arts organisations.

The paper focuses on a series of residencies in three UK arts organisations. The research aims to identify the cultural conditions which support or prevent short-term digital innovation becoming 'embedded' in the ongoing practice of a cultural organisation. The paper considers differing practices, attitudes and expectations between creative technologists and arts organisations. These differing 'cultures of innovation' may help us to understand why digital innovations often fail to move beyond temporary and pragmatic problem-solving towards more challenging, transformational effects on organisational strategy and culture.

**Key words:** digital innovation; organisational culture; agile; residencies; evaluation

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**Digital transformation and the arts: a case study**

This paper considers the interaction between digital technology and cultural organisations and the challenges and opportunities this interaction presents for practice and for policy. The paper is based on one of eight research projects supported by the National Endowment for Science, Technology and the Arts (NESTA), the Arts and Humanities Research Council (AHRC) and Arts Council England (ACE), designed to analyse the effects of digital innovation in UK arts organisations. Our research focuses on a series of digital technology projects in three UK arts organisations. The projects were designed as short five week digital 'sprints' rather than long-term residencies, and the aims of each project left deliberately open-ended.

Innovation remains poorly defined in an arts and cultural context (Bakshi and Throsby 2010. 11-12) and digital innovations in the arts have tended to focus on specific outcomes in audience outreach and artform development rather than organisational change. Our research considers innovation in a broader organisational culture perspective, seeking to identify and intervene in a 'culture of innovation' – a set of practices and behaviours within which innovative ideas can be nurtured and applied. Our underlying assumption was that the process and methodologies of creative technologists might be different from those of arts organisations, and that some mutual learning might result in a new 'culture of innovation' in the host organisation. The aim of the residencies was thus to consider how digital technologies can move beyond temporary and pragmatic problem-solving towards more challenging but less measurable effects on organisational strategy, processes and culture.

These cultural effects represent a form of 'hidden' innovation in the creative industries, encompassing the kind of changes in organisational structure, management and strategy noted by Miles and Green (2008, 72). It also provides an invisible platform for other more visible forms of innovation in product design and dissemination. Understanding the cultural aspects of innovation might therefore be a useful complement to research on the role of implicit knowledge in organisational creativity (Nonaka and Takeuchi 1995). Policy makers might in turn consider cultural factors alongside knowledge base, skills capacity and organisational scale as variables which can help or hinder the adoption of digital innovation in arts organisations[1]. According to Brennan and Dooley, 'new knowledge is created within an organisation by converting between the tacit, and explicit knowledge, thereby creating new connections'; establishing these connections is the essence of creativity (Brennan and Dooley 2005, 1390).

Some of the project's initial assumptions about 'cultures of innovation' have been challenged, in particular the blanket assumption of cultural difference between arts and technology. Quite early in our research it became evident that the arts organisations concerned were far from 'typical' or representative of the arts and cultural sector in general. Within and between the three arts organisations there were varying attitudes to risk and failure and different levels of accountability and degrees of digital literacy. Similarly the residents took differing approaches to the residencies, from experimental to pragmatic. Most residencies combined both approaches, a dualism which was encouraged by the project design (two residents, two short residencies).

Innovation is, of course, a dualistic process, combining the discovery or creation of novel ideas with their application or adaptation to solve a particular problem. This fits with a standard definition of creativity as combining novelty with value (or usefulness, 'fitness for purpose'). Amabile extends this definition to include the notion of collaboration, viewing creativity as 'the production of novel and

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[1] Other national programmes have specifically set out to address capacity building for digital technology in the arts. For example the AmbITion programme in Scotland, aims to enable arts organisation to 'grow in their capability, capacity, creativity and confidence to make the most of the opportunities of digital technologies' ( http://www.getambition.com/) .

useful ideas by an individual or small group of individuals working together', where the idea is 'appropriate, useful and actionable (Amabile, 1998).

In an organisational setting, this dualistic process can be visualised as a tension between experimental risk-taking and organisational development. 'Risk and development' is not so far from the familiar term 'research and development', and understanding how R&D works in arts organisations was a key concern for the funders of our project, as noted in the 'Culture of Innovation' document alluded to above (ibid., p. 11 – 13). The risk and development dualism correlates to processes of ideation or experimentation and the application or adaptation of ideas respectively (Kirton 1984). As Kirton indicates, the combination of these elements in innovation processes requires a social interaction between different competences and personality types. The task of integrating different elements falls to the producer, who must reconcile different needs and expectations from different stakeholders in the project and broker relationships between the participants (Bilton and Leary 2002). For us, this role was fulfilled both by Caper, a digital agency led by Rachel Coldicutt and Katie Beale who had designed the project and were responsible for identifying and recruiting both the arts partners and the resident technologists, and by the arts managers who had to manage expectations as the projects got under way and who (to varying degrees) bought into the overall aim of experimental projects with unplanned but hopefully useful consequences for their organisation.

Understanding innovation as a social, networked process involving multiple capabilities moves us away from the glamorous solitude of individual creative brilliance towards a social process of innovation involving teams and networks (Brennan and Dooley 2005, 1389). In our research we focused on the more incremental social process of innovation rather than the occasional peaks of idea generation or individual creativity. Our underlying assumption was that the slower incremental processes would release and capture the more sporadic 'breakthrough' moments of discovery and ideation. In this context digital communication tools played a crucial role in facilitating the social interactions and collective processes behind and before innovation.

In the end the residencies combined different approaches to innovation, from product innovation to the more 'hidden', incremental changes in organisational behaviour alluded to above. There was an ongoing compromise between the residents' desire to make innovative products, and the organisations' desire to make useful, less spectacular tweaks to processes, knowledge and resources. Sometimes the residents were providing basic technical support (even though this was explicitly not one of the project aims), sometimes they were running workshops to improve digital literacy, sometimes they retreated from the organisation to dream up new products (not all of which were useful from the organisation's point of view). The residencies brought about a collision of ideas and approaches which fed off each other. Residents and arts organisations had to work together, mobilising different capabilities (experimentation and adaptation, taking risks and learning from failure as well as success). Overall the process was highly social and one-off innovations were embedded in an incremental process of organisational adaptation and learning.

Our research also highlighted the extent to which arts organisations can become more reflexive. Arts organisations are expected to be innovative in terms of 'what they do' but not necessarily in terms of 'how they do it'. The residencies encouraged the arts organisations to become more aware of their own internal process of innovation, not just the products of innovation.

In the next three sections we will consider how the innovation process unfolded, beginning with some observations on the aims of the project and the cultural conditions at the outset. The next sections will consider how the innovation process worked during the residencies, and the final section will consider the outcomes. Because the residencies are not yet completed at the time of writing this final part is inevitably somewhat speculative, but our initial findings support our hypothesis that the valuable outcomes of the project centre on incremental changes to organisational processes rather than innovative products and solutions alone.

## 1. Cultures of innovation

The Happenstance[2] Project consisted of a series of creative technology residencies, placing three pairs of creative technologists into three arts organisations for approximately twelve weeks from March 2012 to June 2012. The project was conceived by Rachel Coldicutt at Caper, a digital agency with experience of running 'hack days', managing digital projects and devising digital strategies, and by Laura Sillars, co-director of Site Gallery in Sheffield. The project was selected for funding by NESTA and ACE with the aim of examining how digital technology and creative uses of technology can become 'embedded' in arts organisations. Alongside Site Gallery, Lighthouse in Brighton was identified as a second arts organisation, and a third, Spike Island, was recruited in November 2011. The Warwick research team[3] also joined the project in November 2011. Following some initial scoping of the aims of the project, Caper began to search for suitable technology residents and candidates were interviewed at NESTA's offices in London in January 2012. The technologists included designers, developers, programmers, user experience designers, and combinations thereof; a few pairs applied jointly but most applied as individuals, and the three pairs eventually selected for Happenstance had not worked together previously. An induction day was held for the six selected 'residents' at their respective 'host' organisations in March 2012. Both the selection and induction process were conducted as 'sandpit' events, with rapid exchanges of ideas driving fast prototypes. This social innovation approach was intuitive to the residents if not to the arts organisations. The residencies began the week after the induction, with residents expected to spend two to three days per week with their hosts. Because of some delays in recruiting the third arts organisation, the timetable was compressed and the two five week sprints followed each other without a break.

From the outset, certain cultural conditions were common to all three arts organisations and residencies. On the other hand we also observed certain cultural differences which would take on greater significance as the project developed.

*Digital Literacy and Engagement*
Each of the three organisations was 'digitally literate' to varying degrees. Whilst at least some staff members understood the language of digital technology, there was a tendency to view digital technology in relation to IT infrastructure or to artistic work in the gallery rather than as something integral to everyday processes. Ranging along a spectrum of digital literacy Lighthouse was possibly the furthest advanced describing itself as a 'digital culture agency', hosting Brighton University's MA in Digital Media Arts and engaging public debate about digital culture in its monthly talks. Spike Island's director admitted to being relatively unfamiliar with digital technology. Site Gallery positioned itself somewhere between these extremes, with a digital presence through some of the exhibited work and through their relationships with the local digital community, but lacking a strong digital capability within the core staff team[4].

However, these organisations were already curious about the potential of digital technologies, and had some basic technical knowledge across the staff team. Secondly, all three senior management teams had, to some extent bought into the Happenstance project, had mobilised the support and enthusiasm of their staff and saw the project as an opportunity to enhance their profile and build links with the digital community outside the organisation. Thirdly, they were initially prepared to accept Happenstance as an open-ended, risky process. The project was designed as an open-ended 'agile' innovation process where objectives would be recalibrated in response to ongoing outcomes and discoveries. For this to work, the organisations needed to embrace change, accept failure and weave together unexpected outcomes into an ongoing project rather than simply following a brief towards a particular outcome. This was enabled partly by the support of senior management alluded to above, but also by the willingness of the technology residents to work with the grain of the organisation

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[2] The name 'Happenstance' was devised by Ruth Leary at an initial project planning meeting in November 2011.
[3] The Warwick research team consists of Chris Bilton, Ruth Leary and Katherine Jewkes.
[4] Site's technology manager left shortly before the start of the residencies and was only replaced in the third week of the residency. As a result residents spent some time in the first few weeks providing basic technical support.

rather than pursue individual projects. As the residencies developed, the organisations' tolerance for experimentation and the residents' ability to adapt to organisational constraints were stretched.

*Expectations*
As the Happenstance Project progressed from this initial unity of purpose and expectations, differences among the organisations and residents began to emerge. First and most importantly, although all the organisations accepted that Happenstance was risky and open-ended, there were differing expectations. One organisation had a much stronger sense of the residencies delivering specific benefits and outcomes, while the other two were more prepared to allow space for experimentation. This also reflected differing stages in organisational development; all three had relatively new leaders and, whilst one had recently undergone a substantive organisational re-evaluation, the other two were engaged in this process concurrently with Happenstance. This meant that some of the residents were drawn into an ongoing organisational development process or had to work within emergent strategies resulting from that process, while others were free to experiment with no expectations. Other external and internal stakeholders were more or less willing to embrace unpredictable or spontaneous developments. As a result some residents felt more involved than others in organisational strategies and processes.

*Spaces for innovation*
Material differences in the physical space and working environment would also affect the relationships between residents and organisations. Spike Island, housed in a former tea factory, spreads across multiple spaces, including gallery and office space, artists' studios, meeting rooms and 'associate spaces', and a cluster of rented office, studio and meeting spaces for creative businesses known as Spike Design, as well as other tenants renting parts of the building. There were several entrances to the building and no obvious 'centre' or 'home' for the residents to locate themselves. Site Gallery's building once housed photography workshops, studios and darkrooms which were later converted into a series of small offices. These were redeveloped to create a new open plan office space just before the residencies started, creating a shared work space for staff and residents. Similarly, staff at Lighthouse share an open plan office where a couple of spare desks are available for resident artists and part-time workers; the residents were easily accommodated within the team. Evidently the decision of where the residents would sit in the building and their physical proximity or distance from other people in the organisation would have a direct effect on the extent to which they could become 'embedded' in the organisation.

Aside from the physical geography, the differing organisational structures would also affect the roles and relationships of the residencies. Again Spike Island has a more dispersed structure, with a relatively small core management team and a diversity of sub-groups and constituencies, not all of whom are known to one another. Site Gallery's two directors tend to combine strategic and operational roles, working closely with other staff. The residents, one of whom already rented an office in the building, were easily absorbed into this collective ethos. At Lighthouse, the combination of a small core team and director who were used to curating and working with artists afforded the residents the same welcome as 'artists in residence' both by protecting their time and making resources available to them. One of the residents was local to Brighton and spent additional time 'hanging out and getting to know the organisation.' Such factors would inevitably affect the 'embeddedness' of the six residents.

*Creative technologist; a shared definition?*
Prior to recruiting the residents there had been much debate about what to call them: designer, developer, programmer, technologist, artist, geek? As one of the residents remarked, "'creative technologist; who knows what that means? I don't." The lack of an exact meaning, diversity of skillsets and willingness to self-identify (or not) made for a variety of expectations and approaches. Some residents were used to working to a brief and preferred clear direction, while others were more comfortable thinking on their feet. A few even arrived with a preconceived project that they intended to impose on the organisations, though most of these were weeded out during the selection process.

During the residencies there was a continuing and interesting tension between the residents' efforts to respond creatively to the needs of the organisation, and their desire to initiate projects of their own. This tension was built into the Happenstance process, and relates more broadly to the dual nature of innovation noted in our introduction; innovation strives to be useful or valuable, but also to disrupt and challenge existing practices. Each pair of residents combined different skills and personalities. The recruitment process was an attempt to match these attributes between the residents and ensure a good fit between residents and organisations. As the residencies progressed, the balance between residents serving organisational priorities and proactively initiating and provoking a response would play out differently in each organisation. As project producers, Caper played a crucial role in brokering and underwriting the trust relationships on both sides and in providing a shared conceptual framework and common language for the process.

*Commitment*
Consequently there were varying degrees of commitment and 'buy-in' from both residents and organisations. To begin with some of the residents were more willing than others to embed themselves in the arts organisation, putting their own ambitions on hold; this commitment was tested as they confronted the realities of lengthy staff meetings, to-do lists and daily rituals of organisational culture (making tea). The part-time status of the residencies challenged the notion of embeddedness since several of the residents were juggling other commitments and freelance projects alongside. The five week 'sprint' format allowed little time for the residents to formulate their role or to adjust to their new surroundings. In retrospect residents and arts organisations agreed that a longer induction process would have allowed them to hit the ground running during the first five week sprint, but external scheduling constraints prevented this.

Similarly, whilst all of the arts organisations had their own agendas and ambitions for Happenstance, some were better than others at concealing this, biting back their desire to be prescriptive and trusting in the serendipity of an undirected creative process. In the end most of the residents and arts organisations were able to adapt to each other and to reconcile their varying personal and professional goals satisfactorily. However, tensions between 'process' and 'product' emerged, particularly as the residencies entered their second phase. With the end in sight, both residents and organisations became more anxious about the lasting impacts and tangible outcomes of the project. In the next two sections we will consider these tensions in more detail, focusing first on the innovation process during the residencies, then on the project outcomes.

## 2. Process
The Warwick research team observed the residencies through weekly visits to each organisation meeting with residents, organisation staff and stakeholders, supplemented by blog posts, twitter feeds and telephone conversations. The following observations were taken from the midway point in the residencies at the end of May 2012, with a second 'sprint' still to come, running through to the end of June. This section highlights differences in process between technologists and arts organisations, leading to some initial observations about the nature of innovation in the final section.

*Agile Development*
At the start of Happenstance, Caper introduced the idea of 'agile' development, a flexible approach to software development which emphasises collaborative, adaptive teamwork practices, efficient software engineering tools and quick design cycles through self-organising, explorative work (Aoyama 1998; Schwaber 2002) in an environment of mutual trust and respect (Agile Manifesto 2001). The key principles are flexible people, processes and technologies (Gunasekaran & Yusuf 2002) with a focus on 'collaborative work, concrete results, delivering value and minimising waste' (Shore 2007). This style of working allows for rapid prototyping or 'shipping' (Godin, 2010) and continuous development of outcomes and team interaction. In the event, it was decided not to adopt a formal 'agile' process for the residencies, but there were still some residual elements of an 'agile' philosophy in terms of approach. For example, the daily meetings (scrums) used to manage 'agile'

were not practical (or necessary) for the arts organisations, but the principle of capturing and reflecting on progress did filter through into the residencies.

The technologists were apt to work across multiple tasks and projects, recycling discoveries and resources from one to another. The residents were continually looking for smarter, faster ways of working. Some of these were adopted by the arts organisations, for example a simple project management software 'Trello' was used by the residents in Site Gallery to organise and prioritise tasks, and this was then adopted by the directors to manage the gallery. Residents were also resourceful in recycling old ideas and technologies; some of the projects they took on were based on ideas that the organisation had already floated but had been unable to capitalise on, and the residents had the tools to put these speculative ideas into practice.

Organisations, especially project based arts organisations, often lack an institutional memory, making it harder to learn between isolated projects (Grabher 2004); project management software provided a mechanism for capturing and sharing fragments of ideas between projects and individuals. More broadly, an emergent theme in the residencies was the attempt to make processes visible – so the ideas and interactions which occur before and behind a completed project were captured and made visible through various technologies. At Lighthouse, the residents piloted 'Offbot', a virtual office robot who invited staff to talk about their current activity,and made visible the collective patterns which emerged from their individual voices. At Spike Island, motion sensors were used to capture physical movement and interaction through the building, encouraging people to communicate; the kettles were wired to alert users of the building when might be a good moment to meet a colleague for a cup of tea in the kitchen.

Despite initial resistance to agile as a management approach there were signs that it may yet prove to be of value. Early on one of the residents, a self-confessed agile sceptic, explained her resistance to the adoption of agile methodology on the basis that, "implementing it is really hard, it needs to be enforced and it doesn't always work because of the team/ people. Also where the team already shares this or a similar philosophy there is perhaps no need to impose a framework - it's forced, artificial. In software development it is held as revolutionary, it's useful in specific circumstances but it depends so much on a specific context." However, a few weeks later, having observed the library quiet that reigned in the open plan office, she felt that introducing the Agile Manifesto (Agile Manifesto 2001) to the team as a wall poster might encourage more face to face interaction and promote more effective communication between them (prior to this staff tended to email rather than cross the room to talk to one another). This led to a week long ban on emails and confessions from team members that they too had been disturbed by the eerily quiet office and were now relieved to have been given permission to talk to one another by the resident's intervention. Though this bore little resemblance to the original intention to implement an agile approach, borrowing from the principles meant it was possible to effect an oblique but positive change in the team's interaction. As the manifesto is assimilated in other ways during the final sprint, 'agile' may yet prove a constructive framework by which arts organizations can manage both process and communication.

*Evaluation*
The Happenstance project's emphasis on process rather than innovative products encouraged arts organisations to live up to the rhetoric of 'learning organisations' (Senge,1990) and to be more reflective about their own internal processes. In the words of one resident, "They have become a more reflexive organisation. They are thinking more about how they do stuff." Directors found themselves conducting lengthy conference calls on their experiences and concerns, and the mere presence of the technologists forced the organisations to become more articulate and aware about their internal systems. One of the directors privately admitted that the tangible products and outcomes (thermal printers, virtual drawing machines, tweeting kettles), whilst obviously innovative and clearly satisfying to the residents, would probably have less of a long term 'transformative' effect on the organisations than subtler changes in behaviour (playing with digital tools and equipment, increased confidence and digital literacy, more effective communication, empowerment through learning, becoming enthusiastic about coding and developing the ability to build and innovate for themselves.)

These more implicit, incremental forms of innovation were of course more difficult to capture or evaluate. As Happenstance was a publicly funded project, there were regular reporting requirements in the form of blog posts, open house meetings and 'show and tell' sessions within each organisation, conference presentations, meetings with mentors, stakeholders and members of the research team. Furthermore some of the developments attracted interest among the digital community, and residents were aware of being publicly exposed to external scrutiny as well as subtle competitive pressures from each other every time one of them unveiled a new technology or project. For some of the residents too, freed from the constraints of contractual work, the Happenstance project was an opportunity to make their own mark, and this opportunity created its own self-imposed pressure and performance anxiety. In this context, it required a certain amount of courage and mutual trust to hold back from delivering tangible outcomes and simply allow the mutual learning between technologists and arts organisations to unfold at its own pace.

A long-term legacy of resources, digital tools and changing attitudes is harder to evaluate than some clever, eye-catching innovations in the gallery or workspace. Finding an approach to evaluation which does not overburden the participants and protects an open-ended process was a key challenge for this project and for any similar projects in the future.

*Outside in*
A major difference between the residents and the organisations lay in their role as freelance individuals within a tightly structured organisation. Most of them were continuing to earn money through other work outside the residency and several of them continued to be based in London, commuting to the arts organisation three days each week.

'Disruptive' technologies are so called because they break up organisational routines and challenge accepted priorities and practices. Certainly some of the technologies introduced by the residents had this effect; bringing in Arduino kits for staff to play with hardware, or showing staff how to rewrite code on websites using 'Xray Goggles' software were a catalyst for discovery. On the other hand the residents enjoyed the freedom and space that arts organisations can rarely afford, allowing them to build rapid prototypes. Technologists are used to 'fast failing', indeed there has been much discussion of the fetishisation of failure among technologists who regard failure as a learning opportunity. This is manifest in the building of low-cost experimental prototypes to find out what works, not as an end in itself but in order to learn for the next version. Arts organisations are inevitably more risk averse; they cannot afford to be seen to fail by their stakeholders. Commissioning an exhibition from an unknown artist might be seen as experimental – but given the costs in terms of time, money and reputations, it is an experiment which cannot be allowed to fail. In this context, the outsider status of the residents and their lack of accountability licensed them to challenge norms and disrupt expectations. As one of the directors pointed out the project itself may also provide them with a safe mechanism for talking about failure as, "We're very bad at doing this – it's perceived as a threat to our relationships with stakeholders."

At times the differences between freelance technologists and stakeholder organisations led to inevitable friction. After all, the freelance technologist's lack of accountability could come across as uncommitted or even negligent. Sometimes the ideas they developed outside the organisation failed to mesh with internal routines and priorities. Residents needed time out from the organisation to formulate plans, but organisations were reluctant to reduce their contact time. Debates about timekeeping and physical presence indicated a continuing uncertainty around the status and role of the residents as internal outsiders.

Conversely there were some instances where the technologists risked becoming too 'embedded' in the organisation. Residents spent perhaps too much time talking to people about the work rather than actually doing the work. Many of them found the everyday routines of organisational life quite strange, commenting on the amount of time spent in meetings and discussing decisions. There was a danger of being 'sucked in' to everyday routines, helping to fix things around the building because

nobody else was available or technically proficient to do so. The arts organisations had a shopping list of tasks with no time to complete them; they tried to avoid giving prescriptive instructions, to 'bite their lip' when they perceived the residents apparently wasting time on misdirected activity, but the temptation to intervene was always present. Ironically too, the everyday presence in the organisation, not directed to innovating new products and ideas but simply to being 'useful', was arguably the most effective way to influence organisational behaviour and attitudes in the longer term. As noted above, the mundane tasks such as mending a computer or showing somebody how to use a piece of software were cited by staff not only as 'useful', but also as subtly empowering, allowing them to understand and take control of technologies which would normally have been delegated to a specialist technician.

In the end, the status of resident freelancer was possibly more important than title of technologist. One resident commented that some of the issues they observed and wanted to challenge or change would probably have been evident to any outsider; the fact that they proposed digital solutions to some of these challenges was less important than their ability to see the organisation from a different perspective. The resident's trusted status of an invited outsider threw cultural values and practices into relief, and allowed the resident to propose cultural change under the reassuring guise of introducing new technological tools. Another resident spoke of 'using technology as a Trojan horse for catalysing all kinds of change'.

On the whole then, the tension between freelance and organisation was a productive one. The residents and organisations worked out their own solutions to the tension between 'being experimental' and 'being useful', and the external, disruptive perspective of the residents was more helpful than destructive. However, both residents and organisations had been primed to engage in an open-ended process, to tolerate and learn from their differences, and to accept that what appeared to be irrelevant or distracting might eventually yield positive results. It remains doubtful whether arts organisations would tolerate this type of disruption outside the defined framework of a contained project, or whether such a relationship could be sustained in the long term; certainly the project manager, Caper, played a crucial role in setting up and managing mutual expectations.

*Artistic licence*
There was some discussion at the start of Happenstance about the difference between 'artist in residence' and 'technologist in residence. As noted above, there is an expectation that technology will be 'useful' by solving problems and providing better tools and resources. Art, and artists in residence, are often cast in a freer role, licensed to pursue aesthetic goals and leaving the organisation to manage the consequences. All three arts organisations were used to curating artists, many of whom would use digital technologies to intervene in the art space, challenging aesthetic and social conventions and inviting a response from the viewer. Yet the technologists were not expected to behave like artists – they were expected to respond creatively to the organisation and its needs, not necessarily to initiate projects and leave the organisation to respond to their work. Before the induction, the arts organisations set out a list of organisational issues, providing a framework for the residents to respond in their own way; this was not as prescriptive as a brief for a specific project, but highlighted key concerns, such as visibility to audiences and users, internal communication, profile amongst local and national digital community.

Most of the residents we spoke to, despite finding themselves working in an arts organisation, and despite finding resonances and connections between practical and 'aesthetic' applications of technology, insisted that their work was 'creative' without being 'art'. In cultural policy terms their work required a combination of 'art' and 'craft' (Banks 2010). They needed to conceptualise innovative uses of technology but also to combine the technical skills necessary to implement their ideas. In their own terms, they needed to be both 'designers' and 'developers' – to design a new user experience or interface but also to write the software code to deliver that experience.

This combination of skills and approaches gave them a distinctive status. Artists may be granted a special status in arts organisations, protected by curators or intermediaries from organisational

realities and given permission to pursue their own work in relative freedom. Technologists are more likely to be given specific instructions and expected to work within limited time and resources. Our residents were allowed – and expected - to combine these roles. This granted them a free role in the organisation, able to engage with different constituencies. They could link up discussions of strategy and branding with practical suggestions for company websites and internal communications. They could work with curators and artists, but also with front of house staff and technicians. This in turn provided a catalyst for internal communication. A vivid example of this was the lunchtime coding sessions run by one of the residents at Lighthouse, where the director and senior staff worked alongside associates and students.

The residents also helped to build connections externally. One of the residents described herself as a 'node' in a network rather than an individual – "if you get me, you get all these other people as well". Whenever she or any of the residents hit a technical problem or simply needed a new suggestion, their first instinct was to get in touch with a colleague or contact in their wider networks. This networking was mostly pragmatic – in order to share ideas and resources or to learn new skills – but also tapped into the arts organisations' strategic aim to build profile and credibility in the digital sphere, locally and nationally. Digital tools are inherently collaborative, and the status of the residents as creative technologists allowed them to broker new working relationships within and outside the arts organisations.

None of this would have been possible without a high level of mutual trust. The arts organisations gave the residents licence to question their processes and priorities, and the residents responded by accepting some of the constraints of organisational life. Underlying this mutual trust was a faith in the Happenstance process – a belief that by allowing the project to run its course without preconceptions or inhibitions, a creative solution that is both novel and apt would eventually emerge.

## 3.   Outcomes

The aim of the Happenstance research is to evaluate the long term organisational effects of short term digital technology projects, and to identify some of the organisational factors which can enable or impede the adoption and embedding of digital innovation in arts organisations. At this stage it would be premature to describe the outcomes of the three residencies. However, we can begin by noting the kind of outcomes we will be seeking to identify and to discuss some of the implications of the work in progress for cultural policy and for theories of innovation.

First a distinction emerged between explicit and implicit outcomes. The residents engaged in a variety of projects leading to some specific products – the Offbot communication tool at Lighthouse, the thermal printers connected to SMS, Twitter, email and voicemail communication at Site Gallery. However, longer term effects will be more subtle and intangible, for example changing attitudes to technology, new approaches to internal communication and planning, the spread of digital literacy beyond specialist technical staff. Caper referred to 'glanceable' technologies, meaning one-off innovations in one project that could spark other innovations with other people in other parts of the organisation. We have termed this process 'oblique innovation', where a specific intervention triggers an innovation effect across and sideways from the original project. The adoption of Trello by the directors of Site Gallery as a project management tool was one example of this. More broadly, partly through the residents' presence in the building and partly through specific workshops and open sessions working with staff, a shift took place in attitudes to technology. The arts organisations became more confident, more likely to look for a technological solution to a problem, more willing to treat digital tools as something to work with (or play with!) rather than as obstacles. All of these changes are best described as implicit and oblique effects on organisational culture rather than direct, project outcomes.

Secondly the Happenstance residencies began to reveal the potential for new forms of communication inside and outside arts organisations. It is too early to say whether the residents have effected genuine change here, but they at least highlighted the potential for digital technologies to open up new channels of communication. All the organisations found that much of their work as galleries or digital

media agencies is invisible. Digital media offer a means of making the work behind the scenes of curating an exhibition physically present, or of aggregating the hidden creative activity of artists and tenants behind the closed doors of their studios. One of the emergent themes of the Happenstance project was the desire to make organisational processes visible and vivid to those who work there, as well as to users and visitors. At Spike Island, studio artists worked with one of the residents to design postcards which were electronically tagged to digital information about the artist's work, allowed them to communicate with each other and with gallery visitors; they even included the artist's studio number, encouraging visitors to meet the artist behind the image.

As well as making the organisation more visible to itself, Happenstance helped to make the organisation more visible to the digital community, both in the immediate vicinity and through national showcases such as Future Everything or TedX. Digital innovation is inherently social, and the residents instinctively drew on their existing networks and constructed some new ones. They also facilitated connections between the arts organisations and potential collaborators, often using digital media as the means of communication.

Our third observations centre on the nature of the process and relationships necessary for Happenstance to operate. The residents brought with them a set of digital tools and skills, but they also brought with them a sense of a different, 'digital' culture: a commitment to fast prototyping, experimentation, efficient and rapid processes, a desire to connect outwards and share ideas rather than owning them. Frequently this openness was implicit to the 'way things are done' with Offbot a prime example of an innovation that is developed in public view on an open source platform (Github) where the code is freely available to anyone to download and use. These cultural inputs were at least as transformative as any technical capabilities. Arts organisations are tightly knit both internally and in their membership of an arts 'community'; all of our arts organisations knew each other and some of their senior staff had worked together previously. By contrast the technologists did not necessarily know each other but were eager to connect to each other's networks and to import new ideas and technologies from the outside.

The bringing together of two different 'cultures' was a key aim of the Happenstance Project. Whilst, as noted earlier, the stereotypical separation of 'cumbersome, accountable' arts organisations and 'free, experimental' technologists was too extreme, there remained some important and challenging differences between the creative technologists in residence and the arts organisations. Managing these differences was not easy – there was some frustration on both sides over time spent on tasks which seemed irrelevant or ineffectual to the other. For the relationship to work, both the residents and the arts organisations needed to recognise their differences as an opportunity to learn and change, and meet each other halfway by adjusting their behaviours and expectations to fit the other. For the most part, this balance was achieved. The mutual trust and 'buy-in' filtered down from the top. For the organisations, it was crucial that the directors were fully behind the Happenstance process. For the residents, the continuing contact with the Caper team and with external mentors brought in by Caper were necessary to remind them of the larger aims of the Happenstance process beyond their own individual projects.

There is evidence of high demand in the arts and cultural sector for digital R&D[5]; what might be the implications of Happenstance for other similar projects in the future? From a cultural policy perspective, there is considerable interest in the possibilities of digital technologies for developing new hybrid products and services, and for finding new ways to engage with users and audiences (Bakhshi & Throsby, 2010). The Happenstance project points to a third possibility, that the interaction between arts organisations and digital technologists can also instigate cultural change, opening up new ways of collaborating and communicating within teams and new approaches to project management. And if arts organisations are to take advantage of opportunities for new forms of digital production and new forms of audience engagement, they will also need to weigh up the challenges

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[5] NESTA received an 'overwhelming response' to the Digital R&D Fund with 494 applications from arts and cultural organisations of which 393 seeking a total of £24 million were deemed eligible. (Bakhshi & Pugh, 2011)

(and opportunities) of this broader cultural interaction between two different ways of thinking and working (Unitt 2012). The Happenstance experience suggests that this interaction is more likely to be productive if both sides are primed to adapt to the other, from senior management downwards, and if the pressure to produce quick results is balanced by a more open-ended expectation of incremental change on both sides.

The benefits of integrating digital technologies into the everyday working culture of the arts organisation include better internal communication, greater tolerance for risk and failure (because when technology fails, it doesn't signal the end of the project) and a more collaborative, open culture. The other benefit is the brokering of relationships with a wider community of collaborators, including other creative technologists but extending to others as well (because digital technology is inherently iterative and social).

Some of the principles of Happenstance – short focused residencies, an open brief to engage creatively with the organisation, focus on communication and collaboration – could be applied to any residency, not only to one involving digital technology. One of the effects of a residency is to open an organisation up and inject some new ideas and perspectives from outside the organisational culture. When discussing Happenstance, other arts organisations have suggested that an 'innovator in residence' might be a better job description than 'technologist in residence'. For cultural policy makers, the challenge will be to find the time and space to support this type of engagement, and also the tolerance to allow arts organisations to experiment with no certain outcome.

From an innovation perspective, the Happenstance project has highlighted the importance of combining an ability to invent, experiment and take risks with an ability to adapt, compromise and engage. As noted at the start of this paper, this combination is implicit in the pairing of 'research' and 'development', or the balance between 'novelty' and 'value'. In the context of Happenstance, the freelance technologists were better placed to experiment and come up with novel ideas and solutions; the arts organisations were more concerned with developing, integrating and adapting these ideas, and with finding value in the novel idea. To be innovative, both needed to learn from each other; arts organisations needed to become more experimental and risk-taking, technologists needed to become more adaptive and more attuned to the value systems of the organisation (asking themselves when dreaming up new projects 'why?' instead of 'how?' or 'what?'). Arts organisations are familiar with these processes in the context of developing and displaying art objects, but less attuned to the equivalent R&D processes needed to drive organisational change. Happenstance is one means of opening up a conversation between arts organisations and creative technologists, or between organisations and freelance outsiders. Other mechanisms might include residencies in the other direction (placing arts organisation staff in technology organisations) or ongoing 'day release' exchange schemes between arts organisations and technology companies on a mutual 'pro bono' basis. allowing each to learn from and contribute to the other.

The other perspective on innovation is that slower, less visible, incremental changes to organisations might be more valuable than visibly impressive, radically innovative project outcomes. This is a hypothesis rather than a proof, since any process of organisational change is going to take more than twelve weeks to play out. However, the residents have made it clear that they see their legacy in terms of potential rather than achievement, to be measured through accumulated changes in behaviour and attitudes rather than any tangible pieces of kit or software they have left behind:

"We hope they'll be inspired by our enthusiasm, and that the things we make and the pleasure of making will stay in the system. We want to leave them with a frozen Megatron to be reverse engineered into new ideas, not a replicant, with planned obsolescence."

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