



Gatekeeper perceptions on adopting environmentally sound Information and Communication Technology enhanced live performances to improve the sustainability of music festivals.

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INTRODUCTION

The use of Information Communication Technologies ('ICT') is becoming increasingly central to the way in which audiences experience music festivals. There is growing acknowledgement within the music festival industry of the need to significantly enhance sustainable practices. However, the potential of ICT to drive sustainability at music festivals is under-researched.

In 2019 the band Coldplay announced a decision not to tour their new album and instead encouraged their audience to stream two live performances of 'Everyday Life' from Amman Citadel in Jordan (Patterson 2019: 1). Chris Martin the band's lead singer said the break in touring would create time "over the next year or two, to work out how our tour can not only be sustainable [but] how can it be actively beneficial." (Patterson 2019: 1). This temporary substitution of digital performances for a world tour can be seen as part of a growing trend of environmental consciousness amongst musical artists (Stubbs 2019: 8). It preceded the COVID-19 crisis, which prompted a global proliferation of on-line music festivals **to stimulate new ways for audiences to engage emotionally with ICT enhanced performances (Haferkorn, Kavanagh and Leak 2021: 5).**

Whilst Coldplay's decision implies a belief that deploying environmentally sound technologies ('ESTs') reduces environmental impacts of live musical performances, digitising performances is contentious. Coldplay's booking agent Steve Strange previously stated "I don't believe in virtual festival experiences, you can really only experience a festival by being there" (Bossey 2018: 414).

This research considers perceptions of music festival industry gatekeepers on sustainability, ICT enhanced performances, authenticity, COVID-19 and performance futures in relation to digital content for use on-site and off-site at music festivals/events.

The research analyses existing literature, to inform a dialogue with music festival organisers, consultants and performers deploying mixed methods to address the thesis that: Industry gatekeepers' opinions on the authenticity of environmentally sound ICT generated live content will influence it's adoption at music festivals.

LITERATURE REVIEW

Music festivals

Festivals have been defined as "short term, recurring, publicly accessible events" that provide opportunities for entertainment and prompt feelings of belonging (Mair 2019: 5). Music festivals broadly comply with Mair's definition and can be synonymous with the term 'festival' for example; Shuker (2012: 130) defines a festival as "a concert, usually outdoor, often held over several days". In the UK there were 35.3 million visits to outdoor

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3 music events in 2018, generating on-site and off-site spend of £17.6bn and providing
4 234,380 full-time equivalent jobs (Jackson, Blake and Hibbert 2019: 1).

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6 Music festivals can foster individuality and/or sense of community (Duffy 2019: 307).
7 Occurring outside the everyday, they enable “communitas” (Turner 1969: 94) or
8 “pleasure in sharing common experiences” (Turner 2012: 2) to create feelings of
9 belonging which may endure. Music festivals have been described as powerful drivers of
10 societal change (Jones 2019: 78), although they may also drive exclusivity (Wilks 2011: 7).
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13 The nature of music festivals is fluid over time, so “no one can take a patent on the
14 concept of festival” (Harsolf 2020: 7). A fertile space therefore exists for experimentation
15 with both the form itself, and as a proxy for ways of living increasingly sustainably outside
16 of a festival experience.
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19 **Sustainability**

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21 Sustainability has been defined as “Development that meets the needs of the present
22 without compromising the ability of future generations to meet their own needs”
23 (Brundtland 1987: 7). This requires optimising use of resources without destroying the
24 regenerative capacity of natural systems and implies the acceptance of alternative,
25 environmentally sound strategies and technologies (UN Environment Programme 2020:
26 1). In 2015 the United Nations pledged to adopt 17 Sustainable Development Goals
27 (‘SDG’s). SDG 9 - Industries, Innovation & Infrastructure includes target 9.4 “Upgrade all
28 industries and infrastructures for sustainability” (United Nations 2015: 15) this includes
29 “greater adoption of clean and environmentally sound technologies” (Our World in Data
30 2020: 2). ESTs are techniques or technologies which decrease environmental harm (OECD
31 2001: 1). ESTs include know-how, procedures, goods and services, equipment,
32 organisational and management procedures, so have been described as “total systems”
33 (Srinivas 2015: 4).
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39 All systems comprise independent parts (Cummings and Worley 2009: 754) and total
40 systems approaches can enhance sustainability by considering multiple interrelated
41 factors and instruments (Clayton and Radcliffe 1996: 13). Indeed, some stakeholders have
42 advocated for a systems approach across the SDGs to achieve a coherent overarching
43 outcome (Future Earth 2021: 1). However, effective and inclusive systemic solutions can
44 be challenging to identify (Hutchinson 2013: 55) so when total systems approaches are
45 applied to supply chain management ‘gatekeeping’ activities become influential (Min
46 2015: 3).
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49 Within cultural industries, ‘gatekeepers’ are individual mediators who can exclude or
50 promote an artist, work or format (Janssen and Verboord: 443). Individual gatekeepers
51 curating/supplying live music performances determine the performances that reach their
52 audiences (Gaupp 2020: 127. Foster, Borgatti and Jones 2011: 2). Organisers of,
53 consultants for, and performers at, music festivals can all be considered gatekeepers
54 regarding the adoption of ICT. Significant ‘drivers’ for adopting sustainable practices at
55 music festivals include organisational/personal values of gatekeepers (Mair and Lang
56 2012: 691).
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3 Many music festival organisers are working to reduce environmental impacts by
4 addressing on-site factors including for example waste management and ethical
5 procurement. Glastonbury Festival's report in 2019 that 99.3% of tents were taken home
6 and zero plastic drinks bottles sold (Young 2019: 4) is an example of success in this regard.
7 However, reducing local on-site environmental impacts only mitigates selected effects of
8 music festivals (Collins and Cooper: 2017) and is just the beginning for most events (Getz
9 and Page 2020: 46).

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12 Audience travel for the live music sector accounts for 43% of the entire UK music
13 industry's Green House Gas emissions, with other live music impacts adding a further 30%
14 (Bottrill et al 2007: 3). Powerful Thinking estimated that audience travel generally
15 represents 80% of an individual music festival's known CO2 emission, while the total UK
16 music festival industry's emissions (excluding travel) are 19,778 tonnes of CO2 per year
17 (Johnson 2015: 2). Music festival organisers were advised to customise travel emissions
18 reduction strategies (Bottrill et al 2009: 7). However, Webster (2014: 26) recorded a
19 13.1% rise in audiences travelling to UK music festivals in cars containing 2 or less people.
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23 Some festivals attempt to mitigate CO2 emissions through carbon offsetting. Whilst these
24 simple transactions may sound appealing "you are instantly absolved of culpability"
25 (Petrusich 2020: 11) they remain problematic. In 2019 hundreds of UK local authorities
26 declared a climate emergency, prompting Massive Attack to state that the likelihood of
27 licences being granted for music festivals which do not dramatically reduce emissions is
28 low (Del Naja 2020: 9). Positively, several advocacy organisations including [A Greener
29 Festival](#), [Julies Bicycle](#), and [Positive Event Impacts](#) support UK music festivals to adopt
30 best practice regarding sustainability throughout their industrial processes.
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32
33 Music festivals are reliant on a range of services which impact sustainability and content.
34 Because live music represents one element of the music industry supply chain an
35 industry-wide systems approach to sustainability is required. Quantities of plastic used by
36 the US music industry shrank dramatically as digital formats to consume recorded music
37 became dominant (Julie's Bicycle 2009: 1). This might infer lower carbon emissions, but
38 data centres storing and processing music in the cloud use enormous quantities of
39 resources and power (Brennan and Devine 2020: 7). **Usage rates are also a factor as
40 streaming an album more than 27 times consumes more energy than manufacturing a
41 CD (George and McKay 2019: 11).**
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45 **All digital consumption processes globally use energy due to manufacture, shipping,
46 powering and cooling (ClimateCare 2021: 4) generating an overall carbon footprint of
47 3.7% of greenhouse gasses. Due to COVID-19 lockdowns global internet traffic grew by
48 40% between February and April 2020 (Taylor 2021: 3).** Therefore, new digital industrial
49 processes may have increased the overall carbon emissions of the global **recorded**
50 music industry.
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53 In addition to studio recordings of musical performances, potential exists to reduce the
54 impact of live music. Here the use of ESTs remains under-developed and currently the
55 overall carbon footprint of digital consumption processes for live performances at music
56 festivals is hard to quantify. However, evidence exists of increased efficiencies, with
57 Spotify transitioning to the Google Cloud Platform during 2018. As a result, Spotify
58 decommissioned six of its seven data centres to claim a reduction of almost 1,500 tonnes
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3 in the carbon footprint of its streaming and computing platform. (Spotify 2018: 22).
4 'Upstream' suppliers, including musicians, may be another source of innovation (Liburd
5 and Edwards 2018: 191).
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9 **ICT enhanced performances**

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11 UNESCO (2019: 1) define ICT as the "diverse set of technological tools and resources used
12 to transmit, store, create, share or exchange information" which specifically includes the
13 internet and live and recorded broadcasting technologies. The music industry has
14 embraced ICT so it is now "perhaps most succinctly characterized by the gradual
15 disappearance of a tangible product" (Askin and Mol 2018: 168). ICT is becoming
16 increasingly deployed in the production of live performances at music festivals through;
17 social media, enhanced production, live streaming, holographic performances, virtual
18 reality ('VR') and augmented reality ('AR') (Van Winkle and Bueddefeld 2020: 8, Bossey
19 2020: 11)
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23 Streaming content from music festivals enables individual consumers to 'listen to music
24 or watch live video in real time' (www.bbc.co.uk 2019. 1). Market penetration of
25 holograms in live music markets is increasing, where audiences accept holographic
26 performances as live music (Hughes 2020: 118). VR or "near reality" (Virtual Reality
27 Society 2020. 2) is developing rapidly, so may be deployed to offer 'live' content from
28 music festivals. AR could transpose elements of a live performance from a music festival
29 onto the physical environment that an individual user inhabits, adding to the reality a
30 viewer would ordinarily see (Emspak 2018: 1).
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34 Audiences at music festivals are often open to innovation and highly engaged with social
35 media (Hudson and Hudson 2013: 221). The development of hybrid events which
36 simultaneously engage remote live audiences with venue-based music festivals is
37 occurring (Cal 2020: 3). Although contextual relationships between digital experiences
38 and specific music festivals are important considerations (van Winkle, Cairns, MacKay and
39 Halfpenny 2016: 216).
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43 **Authenticity**

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45 Consumer perceptions appear central to the establishment of authenticity within live
46 music. Wang (1999: 352) identified three categories of perceived authenticity within
47 tourism; objective, constructive, and existential: Objective authenticity is object-related
48 and based on evidential or objective standards. Constructive authenticity is object-related
49 and based on projected expectations, preferences or beliefs. Existential authenticity is
50 experience-related, referring to a state of being linked to emotions, sensations and a
51 sense of self. Various academic studies underlined how important considerations around
52 authenticity are to cultural tourists when forming 'satisfaction judgements' (Dominguez-
53 Quintero et al 2018: 249). Existential authenticity appears key to the perceived validity of
54 digital experiences for cultural tourists, including attendees at music festivals.
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58 Authenticity has been described as a relational institutional practice, performed by:
59 "producers, consumers, and selectors of music", which is becoming increasingly difficult
60 to manage in a digital music industry (Askin and Mol 2018: 181). Authenticity is essential

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3 for most visitors to music festivals (Girish and Ching-Fu 2017: 1551), who regularly
4 demonstrate inventiveness when in co-creating experiences (Szmigin et al 2017: 10) to
5 author elements of existential authenticity. Senses of communitas and 'living in the
6 moment' may be factors here.
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9 Music festival audience's sense of 'liveness' is evolving to incorporate technology so live
10 music "can no longer only be considered as the unmediated performance experienced in
11 a natural face-to-face contact" (Tsangaris 2020: 202). In this new environment 'live' could
12 mean a virtual event within an online archive enjoyed without the restrictions of time and
13 place (Mallinder 2020: 55). Some audiences may already feel digitised music festival
14 experiences are validated by existential authenticity, however industry 'gatekeepers'
15 dictate access to experiences.
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18 **Impacts of COVID-19**

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21 COVID-19 is a disease caused by a new strain of coronavirus (Bender 2020: 3) which
22 severely impacted the music festival sector in 2020/21 and initially stimulated an
23 outpouring of online content (Gudgin 2020: 3). The global COVID-19 pandemic forced the
24 majority of events to be cancelled or postponed (Parry 2020: 1) leading to an estimated
25 US\$8.9 billion loss for the global live music industry in the calendar year (Pollstar 2020: 1).
26 Globally the pandemic will lead to permanent changes in usage of digital solutions (NESTA
27 2020: 1). **COVID-19 reduced performance income for musicians, with potentially**
28 **'catastrophic' financial implications despite income from ICT enhanced performances**
29 **for some (Hancock and Tyler 2021: 14). The viability of live music venues is threatened**
30 **(Rendell 2021: 1105)** and a long-term support strategy is required for the live music
31 sector (Davies 2020: 6).
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35 COVID-19 accelerated the uptake of virtual events and streaming which fast become "the
36 new norm" (Tan 2020: 1). The imposition of 'lockdown' stimulated a migration on-line for
37 planned music festivals and the creation of entirely new on-line concepts. One of the first
38 planned events to migrate was circularly-organized sustainable music festival DGTL
39 (Kocay 2020: 1) who delivered a free livestream music festival in early April 2020 from
40 Amsterdam. Other 'big name' music festivals shifting on-line included Burning Man who
41 perceived Virtual Black Rock City 2020 as being "messy and awkward with mistakes"
42 (Burning Man Project 2020: 2).
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46 New on-line music events across all genres during early 2020 fostered a sense of "weird,
47 exhilarating intimacy" (Empire 2020: 4). [Club Quarantaene](#), a 36-hour virtual rave,
48 broadcast exclusive sets and allowing users to interact with each other virtually. The Folk
49 on Foot Front Room Festivals "created a potent sense of solidarity and community" (Folk
50 on foot 2020: 3) amongst fans and artists of an art-form not previously especially noted
51 for digital performance. A ticketed live-streamed gig by Laura Marling from Union Chapel,
52 London worked successfully to monetarise the form, geo-lock tickets and stimulate; "the
53 delicious buzz of exclusivity and climax that makes live music so special" (Richards 2020:
54 4). **Post COVID-19, live music venues will need to integrate digital experiences**
55 **(Westermark and Donovan 2021: 7).**
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60 **METHODOLOGY**

In scope the research was limited by artform to live music festivals. **Primary and secondary research was carried out, adopting a mixed methods approach. A conceptual framework considered sustainability at music festivals, ICT enhanced performances, authenticity and early impacts of COVID 19..**

The research analysed existing knowledge, to inform a dialogue with organisers of, consultants for, and performers at, music festivals who act as 'gatekeepers' (Janssen and Verboord: 443) influencing audience experiences. Performers and organisers correspond to Askin and Mol's (2018: 168) 'producers' and 'selectors' respectively, with 'consumers' intentionally absent so audience members were only tangentially included in the research (I.E. industry respondents as consumers).

The principle investigator previously worked as an artist manager representing clients who performed at numerous international and UK music festivals and headlined Glastonbury Festival main stage. This enabled abductive research; supplementing prior knowledge of the live music industry with a literature review to identify the broad issues for questioning.

Primary research was carried out using purposive sampling (Daniel 2012: 92) to collect and interpret expert empirical evidence through informed narrative. Calls for contributions recruited 50 respondents; 24 via A Greener Festival's Green Events & Innovations 2020, 8 from the Sustainable Event Alliance's Event Industry Hackathon 2020 and 19 from the author's personal contacts. Balance was ensured through selection criteria devised to guarantee a mixed sample of occupations. Respondents self-identified as 10 festival organisers, 11 sustainability consultants, 5 service providers, 6 artists, 2 booking agents, 1 artist manager and 15 other respondents. **No venue managers were represented.**

Drawing on two of the three categories of festival stakeholders (Brennan et al 2019. 11), a re-coding exercise amalgamated respondents into three groups. 20 relating to music festival organisers, including venues and production companies ('organisers'), 15 relating to sustainability, including advocacy organisations ('consultants') and 15 relating to performers, including artists, managers, labels and booking agents ('performers'). All respondents agreed to take part in the research and, whilst no individuals have been named, 35 agreed to their identity and organisation being stated (please see Figure I).

Respondents completed a structured e-mail questionnaire on Microsoft Forms: Closed questions related to name, occupation, employer, country of residence, age and gender. In total 30 respondents were male, 19 female, 0 non-binary, 0 gender fluid and 1 preferred not to say. There were 0 respondents under 20, 4 aged 20-29, 14 aged 30-39, 11 aged 40-49, 17 aged 50-59 and 3 aged 60 and over. By nationality 33 respondents were based in the UK, 11 in the European Union, 4 in the USA and one 'internationally'.

A five-point Likert scale (please see Figure II) ascertained gatekeeper opinions on factors relevant to the thesis. **These were validated through literature review and comprised:** Awareness and support for SDGs, music festival impacts and advocacy role, physically visiting a festival, adopting EST, impacts of Coldplay not touring, engagement with virtual music festival content, the impact of COVID-19 and authenticity. **Chi-Square testing of asymptotic significance (P-Value) identified 11 sets of Likert scale responses which were**

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3 **statistically significant and one (Q7(h)) which was not.** Quantitative analysis **using**
4 **nonparametric testing** was applied to **selected** responses **through SPSS** to **address the**
5 **null hypothesis that medians are the same across categories of gender and age.**
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8 Additional open questions (please see Figure III) elucidated qualitative information,
9 responding to Wilson et al (2017: 206) who recommended that “festival studies embrace
10 greater methodological diversity, including qualitative studies”. Data collection and
11 analysis employed open coding to identify potential narrative themes and categories.
12 Resultant responses were carefully reviewed to conduct thematic narrative analysis,
13 which “reveal the undercurrents that may lie under the simple narrative of the story”
14 (Walliman 2011: 142). Categories were created for specific ICT technologies, sustainable
15 approaches or perceptions of authenticity/interest. Utilising a ‘conceptual framework of
16 innovation responses’ (Nabih et al 1997: 193) themes of adoption, postponement,
17 rejection and no opinion **were identified and outcomes coded against individual**
18 **qualitative questions.**
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22 A convergent design which merges the results of qualitative and quantitative data
23 analyses (Creswell 2015: 35) was used to integrate quantitative and qualitative results.
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25 Ethical principles regarding objectivity were considered around the author’s **historic**
26 professional relationship with some respondents. **Sharing the questionnaire beyond**
27 **personal contacts** ensured that over 60% of respondents were previously unknown to the
28 author. Identifying respondents who gave informed consent to waive anonymity was
29 deemed to be important in maximising the credibility of the research by evidencing
30 professional standing to confirm their expert status. The research was approved by
31 institutional research ethics processes.
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35 The limitations of this case study include the relatively small sample size, mitigated by
36 influential respondents, and limited scope in terms of artform.
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45 ***DISCUSSION OF FINDINGS***

46 **Sustainability**

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48 Responses on the Likert Scale to Q7(a) indicated that 80% of organisers, 93% of
49 consultants and only 60% of performers agreed or strongly agreed that they were aware
50 of the SDGs. Furthermore, in Q7(b), 90% of organisers, 86% of consultants and 73% of
51 performers agreed or strongly agreed that they support the aims of the SDGs. However,
52 in Q7(c) 95% of organisers, 100% of consultants and 100% of performers agreed or
53 strongly agreed that the live music industry has an important role to play in raising
54 awareness of sustainable development.
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59 Whilst these results are generally encouraging, it is noted that a higher proportion of
60 organisers supported the aims of the SDGs than were aware of the SDGs. Given that

individual artists can act as gatekeepers and potentially achieve higher profiles across all media than most individual festivals, the evident disparity in their awareness suggests that artists and their representatives could benefit from enhancing their knowledge of SDGs. This could support music festivals to maximise their potential as significant drivers for change (Jones 2019: 78).

When considering music festivals in Q7(d); 90% of organisers, 86% of consultants and 73% of performers agreed or strongly agreed that they were aware of specific environmental impacts. Furthermore, in Q7(f) 60% of organisers, 86% of consultants and only 20% of performers agreed or strongly agreed that they considered fostering innovation by adopting clean EST to reduce environmental impacts at music festivals. The lower proportion of performers may suggest that artists and their representatives would benefit from enhancing their knowledge of music festival impacts and potential mitigations from ESTs and clean industrial processes. Greater adoption of ESTs by artists and other music festival industry gatekeepers would increase alignment with a total systems approach (Srinivas 2015: 4).

Overarching quantitative data from Q7(f) was compared to qualitative data from Q8, where 28% of respondents were coded under adoption and 38% postponement (Nabih et al 1997: 193). The majority of respondents were engaged in reducing environmental impacts of on-site music festivals. When asked about their experience to date of adopting clean EST as part of the delivery of on-site music festivals in Q8; 24% of all respondents had none and 38% only cited physical improvements or raising awareness. These included recycling, renewable power sources, compost loos and eco levies. 8% had engaged with streaming and 4% mentioned digital ticketing technologies. 6% had engaged but did not elaborate, 2% mentioned smart power and 2% had run networked events. 4% could not comment. Through omission, the findings support the need to move beyond mitigating selected on-site effects of music festivals (Collins and Cooper 2017, Getz and Page 2020: 46).

Adopting paperless ticketing solutions can deliver operational benefits at music festivals. In 2000, Organiser 15 devised and launched a paperless ticket system for UK event organisers. Part of the brand was its environmental message 'but this was difficult to quantify'. In 2012 Organiser 15 commissioned an environmental analysis of three forms of online ticketing: 1) paper tickets in the post, 2) print-at-home tickets delivered by email, 3) paperless tickets based on a booking reference. "This showed the relative carbon equivalent cost was 1086:400:1 - quite startling!"

Regarding Coldplay's decision not to tour their album and stream live content instead in Q7(g); 40% of organisers, 26% of consultants and 40% of performers agreed or strongly agreed that this will lead to a growth in virtual music festival content utilising ICT. The lower proportion of consultants who agreed/strongly agreed may suggest that some sustainability professionals underestimate the power of significant artists to drive change and could harness artists to greater effect as advocates. **Nonparametric tests supported a null hypothesis that median scores are the same across categories of age (.631 significance) and gender (.618 significance).** Any responding growth in the use of ESTs in response to the band's decision would reduce the impact of touring by other artist's and therefore arguably constitute an active benefit (Patterson 2019: 3) as broadly desired by Coldplay.

The tendency to identify (and prioritise) mitigations for on-site, transport or advocacy-based impacts suggests that organisers, consultants and performers would benefit from additional training in the advantages and impacts of environmentally sound technologies for music festivals. Suggestions in the literature review that support organisations often prioritise physical processes on-site and/or transport (Bottrill et al 2009: 7) were evidenced through the 20% of consultants citing no/very little experience of adopting clean EST and some commentary “efforts are more often about mitigating environmental impacts, rather than using innovative technologies” (Consultant 5). However, there are signs of change and Consultant 6 confirmed “we are moving our focus to include this aspect in our assessments”.

ICT enhanced performances

Responding personally in Q7(i), 35% of organisers, 33% of consultants and 40% of performers agreed or strongly agreed that they currently engage with virtual music festival content using ICT. The proportions who disagreed or strongly disagreed were; 30% of organisers, 40% of consultants and 46% of performers. It is interesting to note the higher proportions of performers who had engaged and had not. These responses contrast with 26% of all respondents who agreed or strongly agreed and 54% of all respondents who disagreed or strongly disagreed that they had engaged with virtual music festival content using ICT last year, **Nonparametric tests supported a null hypothesis that median scores are the same across categories of age (.964 significance) and gender (.361 significance).**

Although the significance level for the Q7(h) data set was above the qualifying threshold of 0.05, some increased engagement with digital content is observable. **This** is likely to have continued since the research was undertaken due to the on-going pandemic (**Haferkorn, Kavanagh and Leak 2021: 5**). The 30% of organisers who had not engaged is a reminder of the potential power of ‘gate-keepers’ to the live experience who may not support virtual festival experiences (Bossey 2018: 414).

When describing their experiences of working on virtual music festivals in Q9; 50% of all respondents had none, 24% had experience of on-line events, 12% cited experience of streaming and 14% were looking to develop virtual events. Working with ICT is “still very much a learning curve” (Performer 13) with nascent beginnings of a mixed world approach in evidence from several respondents. Streaming and podcasts from festivals are “definitely growing in popularity” (Organiser 3). For example; Ultra Festival in Miami live-streamed music and video content from festival stages via YouTube (Organiser 5). Organiser 20 described commissioning a piece of music and programming 2 brass bands to perform together from Durham and Copenhagen.

Other ‘adopters’ (Nabih et al 1997: 193) were pro-actively researching and experimenting with virtual content and immersive shows, sharing positive early results “but nothing that I would categorise as a powerful ceremonial festival experience” - Performer 12. Organiser 4 is piloting an Alexa platform to deliver music content to “lonely and isolated people in South West England”. Performer 9 works with artists who had performed at virtual festivals including Seachange Festival. Performer 14 represents a DJ who performed “a number of virtual streams since the lockdown”.

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3 Conversely, some artists reject virtual festivals altogether, “we have had televised
4 performances from festivals, but are not currently interested in the encroaching
5 Facebookification of live music culture” (Performer 15). It is interesting to expand
6 consideration of contextual relationships between digital experiences and specific music
7 festivals (van Winkle, Cairns, MacKay and Halfpenny 2016: 216) to also include contextual
8 relationships between artists and digital experiences. **Regarding working at virtual**
9 **festivals**; 36% of respondents were coded under adoption, 14% postponement and 2%
10 rejection (Nabih et al 1997: 193).
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13 **Authenticity**

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16 Considering virtual music festivals in Q7(l), only 5% of organisers, 26% of consultants and
17 6% of performers agreed or strongly agreed they offer an authentic festival experience.
18 Furthermore; 50% of organisers, 20% of consultants and 33% of performers were neutral,
19 and 45% of organisers, 53% of consultants and 60% of performers disagreed or strongly
20 disagreed. This view was typified by Consultant 10 who believes ‘humans need live
21 experience, engagement, close contact to experience.’ The lack of audience feedback
22 diminishes on-line performance for Performer 8; “adrenalin delivered by audience
23 reaction is what most artists crave”.
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26
27 Results generally supported Girish and Ching-Fu’s (2017: 1551) assertion concerning the
28 centrality of authenticity to music festival audiences. Significantly higher proportions of
29 consultants, had considered adopting EST to reduce environmental impacts at music
30 festivals and felt that entirely virtual music festivals offer an authentic experience. That
31 60% of performers disagreed regarding authenticity is relevant, as they control rights to
32 their performances and could potentially boycott virtual music festivals.
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36 Maximising remote engagement with on-site music festivals was very problematic for
37 18% of all respondents. Many respondents felt there was more to music festivals than
38 music, “art, workshops, talks, community, togetherness, party, new friends, food, drinks,
39 grass, air, tents, volunteers, crowds and more” (Performer 11). Consultant 12 worried
40 about losing “all the learning that people do in a wide and new community, solidarity and
41 behaviour change”. However, according to Performer 10; “I think we will get to a stage
42 where we consider it an authentic experience I just don't think we are there yet.”
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46 Qualitative feedback from respondents around the importance of shared common
47 pleasures “**workshops, talks, community, togetherness, party, new friends**” (Consultant
48 **13**) supports Turner’s (2012: 2) concept of communitas, confirming it’s importance to a
49 sense of authenticity at music festivals. Experience-related physical co-location was
50 evidently important to a significant number of respondents when considering existential
51 authenticity. Other responses suggest this significant challenge to the perceived
52 authenticity of virtual music festivals may not be insurmountable over time.
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56 Responding to Q7(k) regarding watching a live performance from an on-site music festival
57 remotely using ICT, 20% of organisers, 20% of consultants and 20% of performers agreed
58 or strongly agreed this constitutes a ‘live’ experience. The proportion in each group who
59 were neutral was roughly equal and 50% of organisers, 53% of consultants and 53% of
60 performers disagreed or strongly disagreed. **Nonparametric tests supported a null**
hypothesis that median scores are the same across categories of age (.202 significance)

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3 **and gender (.575 significance).** Performer 4 felt that “no amount of technology will ever
4 be able to replicate the atmosphere at a festival”. However, a minority felt engaging
5 remotely with an on-site music festival constituted a ‘live’ experience. This aligns with the
6 work of Tsangaris (2020: 200) and Mallinder (2020: 55); supporting claims that audiences
7 for music festival audiences are evolving their sense of ‘liveness’ to incorporate
8 technology.
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10 **COVID-19**

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13 Considering COVID-19 in Q7(j), 85% of organisers, 73% of consultants and 80% of
14 performers agreed or strongly agreed the pandemic has led to a growth in the audience
15 for virtual music festival content that utilises ICT. COVID-19 was significant in driving
16 interest/activity in virtual music festivals for 12% of all respondents; both as an audience
17 member “since COVID-19, I’ve attended multiple virtual club nights and events”
18 (Consultant 5) and “due to this year’s cancellation” (Organiser 11). Interestingly, COVID-
19 19 “is paving the way for more online ICT opportunities for festivals to engage with their
20 audiences remotely” (Organiser 8).
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24 The high proportion of respondents who agreed that COVID-19 has grown the audience
25 for virtual music festival content aligns with suggestions that the pandemic is accelerating
26 provision of virtual content (Gudgin 2020: 3) and increasing audience acceptance of digital
27 formats (Tan 2020: 1). **Corresponding growth in artists engagement with, and**
28 **monetisation of, ICT enhanced performances could further address existing financial**
29 **challenges for musicians (Hancock and Tyler 2021: 14) and drive innovation (Liburd and**
30 **Edwards 2018: 191).** Quantitative data from Q7(j) regarding gatekeeper perceptions on
31 COVID-19 derived audience growth was compared to qualitative data from Q9 concerning
32 experiences of working on virtual music festivals to date. Potentially COVID-19 may
33 prompt a ‘step change’ in programming of digital music festival content for some
34 audiences, which may endure over time.
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39 **Performance futures**

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41 Opinion at Q10 regarding music festivals of the future designing their audience
42 experience to maximise remote engagement with live, on-site performances was divided.
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45 Amongst all respondents; 18% anticipated some form of hybrid events solution;
46 “interaction and engagement is key” (Consultant 1). “The combination of virtual and
47 physical making the audience feel more engaged and the event more ‘real’” at [Boiler](#)
48 [Room](#) exemplified some learnings for Performer 9. Music festivals could potentially
49 incorporate self-selected attendee journeys through multiple ‘spaces’, and the ability to
50 cluster socially; “creating break out rooms for themselves to mirror the ‘chill-out’
51 experiences people like to have together away from main stages” (Organiser 2). While
52 Organiser 12 anticipated the inclusion of “behind the scenes access and additional VIP
53 experiences”. For Consultant 14 hybrid events enable longer lasting experiences for
54 festival audiences and “co-creation year-round”. A hybridised approach to future festivals
55 in the medium term, seems the most likely outcome at scale for existing music festivals.
56 This supports predictions of a growth in hybrid events (Cal 2020: 3).
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VR/AR/MR felt important to future festivals for 12% of respondents. Performer 3

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2 envisaged VR enabling “a member of the audience to transmit their viewing experience”
3 and Consultant 4 proposed ‘placing’ a person in the venue using “Brain Computer
4 Interfaces”. Supporting the need for innovation, Consultant 11 said; “what a tough
5 mission ... all I can think that might help is VR.” Gamification was specifically alluded to by
6 6% of respondents. Consultant 3 envisaged “unique gamification elements that are
7 specific to the festival”. Whilst the future of festivals could become “like a video game,
8 goggles and all” (Performer 12). “The key is to create a totally different experience - not
9 trying to copy the original experience, designing a-new” (Consultant 13). This may suggest
10 a willingness to explore more radical experiences than currently easily available and **that**
11 **some gatekeepers believe** audiences at music festivals are open to innovation (Hudson
12 and Hudson 2013: 221). That 14% of respondents did not feel qualified to comment may
13 reflect uncertainty in the sector.
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19 Technical challenges and financial limitations, were identified by 10% of respondents,
20 including user capacity (broadband connectivity, home equipment etc) requiring a
21 platform that “runs well with poor connections” (Consultant 1). This may drive inherent
22 celebration of mistakes (Burning Man Project 2020: 2) as digitised formats continue to
23 experiment with what is technically possible. High quality internet connections are
24 sometimes problematic on-site at music festival locations, however roll-out of high-speed
25 internet in remote areas can provide mitigation. Organiser 18 believes this will empower
26 organisers to create “creative spaces that play into a more broadcast type of
27 environment”.
28
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31 Film production values demanding multiple camera angles and good sightlines, may
32 influence site layout “as part of the key design process” (Organiser 3). Technical
33 challenges and high production values underline both a potential need for government
34 investment in infrastructure such as high-speed broadband and a possible disparity
35 between festivals at different scales ability to invest in the ESTs. One potential solution
36 would be enhanced provision of grant funding for this purpose.
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40 Accessibility benefits were envisaged by 12% of respondents including 4% who specifically
41 mentioned affordability. Performer 10 was mindful that for many people with
42 accessibility challenges “this might just be an extension of their current experience”.
43 Respondents addressed the exclusive nature of festivals (Wilks 2011: 7) and identified
44 potential for ESTs to address elements of physical and financial exclusion to increase
45 inclusion at music festivals. For Organiser 16, “accessibility and inclusivity and a woodier
46 audience will all become part of the mix”. Consultant 6 identified positive benefits for
47 attendees “who would not usually afford or enjoy the real “live” festival experience”.
48 Developing the idea of livecasts, Consultant 2 conceptualised “a remote place of
49 gathering’ replicating the ‘sense of community, amenities and vibe of event brand for a
50 reduced price to incentivise participation”.
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55 For Q10, 32% of respondents were coded under adoption, 36% postponement and 18%
56 rejection (Nabih et al 1997: 193). This represents both the highest combined
57 adoption/postponement score and highest level rejection score. Quantitative data from
58 Q7(k) can be directly compared to qualitative data from Q10, with divergence of opinion
59 and **some rejection of ICT enhanced performances** evident in both results.
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CONCLUSION

The literature review evidences an urgent need to upgrade the music festival industry for sustainability. Primary research suggests that industry gatekeepers' opinions on the authenticity of environmentally sound ICT generated live content will influence its use at music festivals. **Statistical analysis of quantitative data indicated that there were no significant variances relating to age or gender against sample responses to sustainability, ICT enhanced performances or authenticity.**

Respondents were generally aware and supportive of SDGs although performers were the least well informed, despite collectively possessing the greatest media reach. Artist's power to advocate for change is partially supported by responses from 40% of organisers, 40% of performers and 26% of consultants, agreeing/strongly agreeing that Coldplay's streamed world tour will lead to a growth in virtual music festival content utilising ICT. **A discrepancy in agree/strongly agree responses to Q7(g) and to Q7(k) amongst gatekeepers is noted.** The potential of artist led advocacy could be further explored and **SDG** training provided for artists, their representatives, and festival organisers.

Most respondents alluded to music festivals as addressing resource use efficiency by improving physical processes on-site. There was significantly less awareness of the potential of ESTs to retrofit the music festival industry, although some respondents felt this could also improve accessibility, generate new forms of celebration/experiences and stimulate entirely new artforms. Sustainability consultancies could develop training packages in ESTs throughout all industrial processes for the live music sector.

The majority of respondents stated that COVID 19 has led to a growth in the audience for virtual music festival content that utilises ICT, supporting claims of increasing audience acceptance of digital formats (Tan 2020: 1). Increased engagement with digital content is observable from the respondents themselves and is likely to continue. **This could partially mitigate existing financial challenges for musicians (Hancock and Tyler 2021: 14).** The importance of communitas to the festival experience was noted by respondents and will be important for organisers of music festivals developing ICT enhanced content.

Some respondents reacted positively to future event formats including enhanced streaming, VR/AR/MR and hybrid events which simultaneously engage remote live audiences with venue-based music festivals. This supports the growth in hybrid events (Cal, 2020: 3) and fluid nature of music festivals (Harsolf 2020: 7) meaning significant format change is possible by adopters (Nabih et al 1997: 193) who may derive commercial advantages. Organisers of on-site music festivals could experiment with hybrid delivery utilising EST to create an authentic offer as a precursor to future developments **to integrate digital experiences to music venues (Westermarck and Donovan 2021: 7).**

Some respondents alluded to technical and financial barriers to developing a live offer which incorporates ESTs. Others identified cost as a barrier to attendance for some audiences. Additional public funding for EST could be provided to upgrade smaller scale music festivals for sustainability. Music festivals could explore lower cost digital offers to increase accessibility to potential audiences who cannot afford admission prices for physical events.

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3 Generally, respondents felt that perceived authenticity remains a barrier to developing
4 digital consumption. This supports the work of Girish and Ching-Fu (2017: 1551) **and is**
5 **important given the power of individual gatekeepers regarding live music performances**
6 **(Gaupp 2020: 127. Foster, Borgatti and Jones 2011: 2)**. These factors may limit uptake of
7 content-based ESTs, suggesting that significant further developments are required if
8 some sense of parity of experience is desired between virtual and physical experiences.
9 Innovation in this regard will require pro-active engagement from music festivals and
10 artists, alongside other stakeholders. This is contentious with some respondents rejecting
11 engagement with digitised content.
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15 Predominantly positive quantitative responses relating to the live music industry's role in
16 advocating sustainability contrasted with negative responses to virtual festivals.
17 **Responses adopting and rejecting** environmentally sound ICT for live content were
18 evident in qualitative results, with significant proportions of undecided or uncertain
19 respondents. The prevalence of postponement and rejection responses around
20 authenticity may prevent adoption where gatekeepers curate performances for
21 audiences (Gaupp 2020: 127).
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25 Despite the significant emissions generated by digital media (Julie's Bicycle 2009: 1,
26 **ClimateCare 2021: 4), which increased due to COVID-19 (Taylor 2021: 3)**, it is likely that
27 increasingly efficient ESTs for streaming and other digital formats will emerge over time.
28 Therefore, digital consumption of live performances from music festivals may increasingly
29 represent a lower environmental impact than the physical act of attending a music
30 festival in person. Potentially, a drive to reduce the overall number of attendees at on-
31 site music festivals enabled by monetarising authentic, 'live' on-line attendances, for
32 some audiences and artists, may represent one element of the future of music festivals.
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36 The benefits of deploying EST to sustainability for music festivals and implications of
37 senses of authenticity to virtual content for music festivals, are under-researched.
38 Academics could consider; the benefits of deploying EST to sustainability for music
39 festivals, implications of authenticity to audience development, and motivators for
40 rejecting ICT for live performances amongst music festival gatekeepers.
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PLEASE PLACE THIS TABLE AT THE END OF THE METHODOLOGY SECTION

Figure I: List of Respondents who waived anonymity

Respondent	Role	Organisation	Q10 Innovation Response code
Consultant 1	Sustainability consultant	Body&Soul Festival	Postponement
Organiser 1	Service provider	Runway Images Productions	No Opinion
Consultant 2	Sustainability consultant	Asteria Arts and Music Festival	Adoption
Consultant 3	Sustainability consultant	Access All Areas	Adoption
Consultant 4	Sustainability consultant	Boom Festival	Adoption
Performer 1	Service provider	Livewire Youth Music	Adoption
Organiser 2	Festival organiser	Shambala Festival	Adoption
Organiser 3	Festival organiser	Greenbelt Festival	Postponement
Organiser 4	Co-promoter	Creative Kernow	Postponement
Consultant 5	Sustainability consultant & PhD student	Kendal Mountain Festival	Postponement
Consultant 6	Sustainability consultant	A Greener Festival	Adoption
Consultant 7	Sustainability NPO	REVERB.org	Adoption
Consultant 8	Sustainability consultant	A Greener Festival	Rejection
Performer 3	Artist	None	Rejection
Organiser 8	Operations & Production Manager	Cornbury	Adoption
Performer 4	Tour Manager	Sam Fender	Adoption
Performer 5	PR	Wild Promotions	Adoption
Performer 6	Artist	Jim Bob	Postponement
Performer 7	Artist manager	Management	No Opinion
Organiser 9	Festival organiser	EMAGIC; AWAKE FESTIVAL	Rejection
Consultant 10	Sustainability consultant	Green Stages	Adoption
Performer 8	Artist	Abdoujaparov	Rejection
Performer 9	Record Label	Full Time Hobby	Adoption
Organiser 11	Festival organiser	Musik i Lejet	Postponement
Organiser 12	Festival organiser	Kilimanjaro Live	Adoption
Consultant 11	Sustainability Assessor	A Greener Festival	Adoption
Consultant 12	Sustainability consultant	Team Love	Rejection
Performer 10	Agent, artist, organiser	The Local, Folk Idol	Postponement
Organiser 15	Ticketing consultant	n/a	Adoption
Organiser 16	Festival organiser	Kambe Events Ltd	Adoption
Performer 12	Artist	arcadia	Rejection
Organiser 18	Service provider	Insomniac	Postponement
Consultant 14	Sustainability consultant	Bristol Volksfest	Adoption
Performer 14	Booking agent	Ace Agency	Rejection
Organiser 20	Festival organiser	Paul Gudgin Festival and Event Management	Adoption

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Figure II: Responses to Likert Scale Questions

Likert Scale Question	Please indicate your level of agreement with the following statements:	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	P Value from Chi-Square Test
Q7(a)	I am aware of the UN Sustainable Development Goals	40%	38%	12%	10%	0%	.001
Q7(b)	I support the aims of the UN Sustainable Development Goals	50%	34%	16%	0%	0%	.013
Q7(c)	The live music industry has an important role to play in raising awareness of sustainable development	70%	28%	2%	0%	0%	.001
Q7(d)	I am aware of specific environmental impacts of music festivals	76%	20%	2%	0%	2%	.001
Q7(e)	Physically visiting a specific place is an important element of having an authentic music festival experience	50%	42%	8%	0%	0%	.001
Q7(f)	I have considered fostering innovation by adopting clean and environmentally sound ICT to reduce environmental impacts at music festivals	14%	44%	32%	6%	4%	.001
Q7(g)	Coldplay's decision not to tour their new album and stream live content instead for environmental reasons will lead to a growth in virtual music festival content utilising ICT	8%	28%	36%	26%	2%	.001
Q7(h)	Last year I engaged with virtual music festival content using ICT	10%	16%	20%	36%	18%	.052
Q7(i)	I currently engage with virtual music festival content using ICT	12%	24%	26%	24%	14%	.038
Q7(j)	The Covid-19 pandemic has led to a growth in the audience for virtual music festival content that utilises ICT	42%	40%	16%	2%	0%	.001
Q7(k)	Watching a live performance from a music festival remotely using ICT constitutes a	4%	16%	28%	30%	22%	.027

	'live' experience						
Q7(I)	Virtual music festivals offer an authentic festival experience	2%	10%	36%	28%	24%	.001

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Figure III: Open Questions (Coded)

	Question	Adoption	Postponement	Rejection	No Opinion
Q8	What experience do you have of adopting clean and environmentally sound technologies as part of the delivery of music festivals in a specific physical place?	14(28%)	19(38%)	2(4%)	12(24%)
Q9	What experience do you have of working on virtual music festivals?	18(36%)	7(14%)	1(2%)	24(48%)
Q10	How might music festivals of the future design their audience experience to maximise the ability for audiences to engage remotely using ICT with a live performance at a festival that takes place in a specific physical place?	16(32%)	18(36%)	9(18%)	7(14%)