

<b>Institution: University of West London</b>		
<b>Unit of Assessment: UOA 33 - Music, Drama, Dance, Performing Arts, Film and Screen Studies</b>		
<b>Title of case study: variPlay: an app to change the way the public listen to music</b>		
<b>Period when the underpinning research was undertaken:</b> Initial research October 2014 - June 2015. Follow-on research programme January 2018 - April 2019.		
<b>Details of staff conducting the underpinning research from the submitting unit:</b>		
<b>Name(s):</b> Justin Paterson	<b>Role(s) (e.g., job title):</b> Professor of Music Production	<b>Period(s) employed by submitting HEI:</b> 2004 - present
<b>Period when the claimed impact occurred:</b> 2015 - 2020		
<b>Is this case study continued from a case study submitted in 2014?</b> No		
<b>1. Summary of the impact</b> (indicative maximum 100 words) Consumer music playback has remained largely unchanged since the birth of recording; music is fixed at the point of release and playback sounds identical on each listen. An AHRC-funded research led to the development of an iOS app-format called variPlay which changed that. It enables either listeners or an algorithm to manipulate musical content as it is played and hear a unique version – effectively a remix – every time. The app had commercial impact through collaboration with Warner Music Group and the British Phonographic Institute, and several international artists released music in the format. The project greatly extended understanding of the commercial issues to be addressed in the wider use of interactive music. There has also been impact on creativity through the artists engaged with the project and on public appreciation of the potential of interactive music.		
<b>2. Underpinning research</b> (indicative maximum 500 words) The underpinning research for this impact was primarily derived from an AHRC-funded project <i>Transforming Digital Music: Investigating Interactive Playback</i> (Oct 2014 to July 2015) which developed a unique interactive-music album format with the potential to transform the way we listen to and engage with digital music. This innovative technology allowed users to manipulate and interact with music in ways that had not previously been possible, bringing new user experiences and opened artistic and commercial opportunities for music artists and the music industry. Research was conducted by Paterson at UWL in collaboration with Professor Rob Toulson, then of Anglia Ruskin University. Paterson led on the algorithmic functional operation and architecture, C++ coding of the audio engine and development of novel music-production workflows. Both researchers contributed to testing and evaluation, and to writing outputs. The principal output of this research was a ground-breaking iOS application (app) that represented this new format of music release, with that specific app delivering a commercial release of the music of artist <i>Daisy and The Dark</i> as a pilot. The app – variPlay – packaged an EP as an app with real-time dynamic playback capabilities. The technology allowed users to manipulate and interact with music in new ways. In addition, the format packaged rich media such as lyrics, photographs, production credits, Internet links and song/artist information. [R1] In operation, a song can be listened to by the consumer in several different ways. The song might be an upbeat rock-genre track including drums, guitars, vocals and a string section. Consider however, that the listener might want to enjoy listening to the song in a more relaxed manner – a unique experience based on the listener’s mood at that moment. In real time, they might use a simple gesture on their phone to morph towards a stripped-down version, perhaps with the electric		

guitars replaced by acoustic versions, the drums becoming hand percussion and the strings taking a more prominent role in the mix. It is still the same song, maintaining the artistry intended by the musician, but now changed to give the listener a different experience.

A unique feature of the app is that it could anonymously report geo-located user interaction with different modes of listening of a single song. Development of the app featured an innovative algorithmic audio-processing system, a unique graphical interface and a novel audio cross-fading system.

The technical phase of the project generated intellectual property around the intelligent audio cross-fades that were developed. A UK patent was filed in 2015 and a subsequent international patent was filed the following year and published in 2017. [R2]

In order to protect the intellectual property and enable future commercial impact, initial publication was limited to a book chapter [R3] although the findings were discussed at a number of international conferences including in Denmark, Poland, Slovenia and several times in the USA.

The AHRC subsequently invited an application to fund a follow-on project, *The Commercialisation of Interactive Music* (Oct 2017 to Oct 2018) on which Paterson was PI. This enabled the researchers to work with the Warner Music Group in taking the technological 'shell' of the variPlay app and repopulating it with the music, images, and text of two major international Warner artists. [R4, R5] The impact generated from the follow-on project is summarised in section 4 of this case study.

An autoethnography of the variPlay project was published in 2019 in which the concept and operation of the app is discussed, alongside reflection on product development, music production, mastering, and issues encountered through the commercialization itself. [R6]

### 3. References to the research (indicative maximum of six references)

R1 Paterson, J. L., Toulson, E. R. and Daisy and The Dark (2015) *Red Planet EP*. Apple App Store. Available at: <http://tiny.cc/1h6khz> (Accessed: 9 March 2017).

R2 Toulson, E. R., Paterson, J. (2017) *Cross-fading Between Audio Files*. Patent application: Publication Number WO/2017/068032; Publication Date 27.04.2017. <https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2017068032>

R3 Paterson, J. L. and Toulson, E. R. (2016) 'Interactive Digital Music: enhancing listener engagement with commercial music', in *Innovation in Music 2*. Shoreham-by-Sea, UK: Future Technology Press, pp. 193–209 ISBN 9781911108047

R4 Paterson, J. L., Toulson, E. R. and Sariñana, X. (2018) *Ximena Sariñana variPlay*. Apple App Store. Available at: <https://itunes.apple.com/us/app/ximena-sari%C3%B1ana-variplay/id1435482151?ls=1&mt=8> (Accessed: 28 September 2018).

R5 Paterson, J. L., Toulson, E. R. and Ofenbach (2019) *Ofenbach variPlay*. Apple App Store. Available at: <https://itunes.apple.com/us/app/ofenbach-variplay-rock-it/id1457847537?mt=8> (Accessed: 27 April 2019).

R6 Paterson J, Toulson R, Hepworth-Sawyer R. User-Influenced/Machine-Controlled Playback: The variPlay Music App Format for Interactive Recorded Music. *Arts*. 2019; 8(3):112. <https://doi.org/10.3390/arts8030112>

### Grants:

- I. AHRC Transforming Digital Music: Investigating Interactive Playback” Programme: Digital Transformations PI: Rob Toulson (Anglia Ruskin University), Co-I: Justin Paterson (UWL), October 2014-July 2015, £64,159. AH/M002535/1
- II. AHRC Follow-on-Fund, The Commercialisation of Interactive Music, PI: Justin Paterson, Oct 2017 to Oct 2018, £72,224, AH/R004757/1.

**Quality statement:**

All outputs (except R3) are included as part of a multi-component output submitted by the University to this Unit of Assessment in REF 2021.

**4. Details of the impact** (indicative maximum 750 words)

The variPlay app has contributed to the wider understanding and commercial opportunities for interactive music, as well as providing a new opportunity for creative artists to develop and release material in this format reaching wide audiences.

**Widening public understanding of interactive music**

The development of variPlay contributed to expanding public understanding of interactive music. The initial pilot with *Daisy and the Dark* – called ‘Red Planet’ – generated positive feedback from a focus group of the public with 93% of respondents rating the experience as excellent or good, and 90% would be willing to purchase. Comments from the focus group included:

“It’s a brilliant initiative, the App shows just what is possible in multimedia formats”

“Really interesting concept, professional and creative”

“Just listening and watching a review of the app as an aspiring songwriter, the app definitely interested me into exploring different styles in my own music and writing”.

Working with *Daisy and the Dark*, variPlay was demonstrated at the Victoria and Albert Museum’s Digital Design Weekend in both 2016 and 2017. More than 46,000 people attended these events. [S1]

‘Red Planet’ has been downloaded 2080 times; the data on this showed it was popular in the UK, but also in China and the USA, and reached Africa, India, Middle East, and Latin America. Data mining indicated that users spent 30% longer engaging with the music than a non-interactive ‘control’ version.

The app was featured on Cambridge TV; at the Cambridge Science Festival; the NESTA Serious Play event; in a Times Higher Education Research Supplement; on AHRC news pages; by invitation at Music Tech Fest (2015 Slovenia) and ‘AI for Music Workshop’ (2019 Shanghai); and adopted as a host for a Sino-UK AI-in-music development project.

Subsequent apps were featured when Paterson discussed variPlay in a June 2019 BBC World Service / Open University programme ‘The Future of Music Technology’ hosted by Pink Floyd’s Nick Mason (BBC estimate: 10 million listeners worldwide). [S2]

**Industry take-up of variPlay**

The ‘Red Planet’ app generated considerable interest within the music and technology industries, with high praise for its intuitive interactive features and the collaboration achieved between the two industries.

A custom-built version of the app was presented by the British Phonographic Institute to the UK record industry as an innovative deployment of technology and featured as ‘record of the day’ in August 2018. [S3]

Five further apps have been released globally to date in the variPlay format, following on from the ‘Red Planet’ pilot. [S4]

The most extensive take-up of variPlay came from the Warner Music Group (WMG), who collaborated with Paterson and Toulson in their AHRC follow-on project. These releases were from Ximena Sarinana (released 2018 by WMG; Warner Music Mexico) and by Ofenbach (released 2019 by WMG; Elektra France). The two WMG releases gained traction in targeted markets: Ximena Sariñana had 741k impressions and 1.6k downloads mostly in Mexico, but also in Bolivia, Colombia, the USA and Paraguay. Ofenbach had 23.5k impressions and 1.1k downloads mostly in France, but also Russia, China, UK and USA, and achieved #1 French Music

App, and #103 overall in the French App Store. The tracks have had more than 63m plays on Spotify and over 20m views on YouTube.

There were also releases by *Asympt Man* (2018, independent); by *Defab1 ft. Vanessa Knight* (2018, Regent Street Records); with a further release by *Langham Research Centre* (2020, Nonclassical) – more than 400 further downloads.

### **Commercialisation of interactive music**

The project has successfully helped to reveal the wide range of issues that need to be addressed to facilitate the commercialisation of interactive and dynamic music.

The Head of Creative and Digital at WMG said:

Partnering with the variPlay project presented a unique opportunity for Warner Music, through which we could explore the appetite for interactive music across our international range of record labels and roster of artists. The project precipitated considerable discussion within our organisation in terms of seeing ‘stems’ in a new light and started many international conversations about how ‘interactive recorded music’ might be deployed, marketed and sold.

Only by going through this process could we understand the appetite for interactive and dynamic music in different territories, including Europe, Asia and LatAm – amongst both the industry and artist audiences. There was notable impact on those labels and territories that released variPlay apps for their artist campaigns, in terms of conceptualisation of interactive audio products, and also audience reaction – and previously, this notion was new to them.

It is they who are now best placed to judge further innovations of this kind, and Warner Music will look to them to draw from their experiences for future high-technology music releases. [S5]

The Product Manager for Warner France said: “94% of clicks come from lookalike audiences! This shows a real interest of ‘non-fans’ in this kind of new tech experience and allows us to reach potential new Offenbach fans!”

The project informed industry on how to take app-based interactive music forward. It showed how to marry technical innovation with industry business models; indicated some potential difficulties in engaging established artists and their management teams with these novel approaches; and highlighted the limited reach of an iOS app in countries where Android dominated.

### **Artists’ responses to variPlay**

The artists engaged by the project responded to the creative opportunities it offered. Sarah Kayte Foster of *Daisy and The Dark* said that the variPlay platform allowed an “experience where the digital listener feels like they have a visual and physical relationship with music again.” [S6.]

Avant-garde classical ensemble *Langham Research Centre* said:

variPlay has been a thought-provoking and absorbing project for Langham Research Centre to be involved with. It has led us to consider the act of composing in a fundamentally different way, as a mutable process that is no longer fixed. This will have a major impact on the way we approach our music from now on. Furthermore, and equally fundamentally, our involvement in variPlay suggests a new relationship between the artist and their audience, allowing the latter considerable agency over the way they want to listen to the music we make. This is a far less top-down approach which challenges the way we have traditionally composed music for commercial release. This too will have significant ramifications on the way we proceed as a group. [S7]

Artists perceive variPlay not just as a creative opportunity, but as something that impacts upon the ontology of their practice. Further, they clearly feel a more potent connection to their audiences when releasing pre-recorded music with the 'live' elements that variPlay elicits.

**5. Sources to corroborate the impact** (indicative maximum of 10 references)

- S1. Email confirmation from Digital Programme Manager, V&A Museum email dated 4 Jan 2018.
- S2. BBC World Service, 22 June 2019, <https://tinyurl.com/ybmv2nep> . A recording of this programme is available from the University if required.
- S3. British Photographic Industry website: <https://tinyurl.com/y4xfkl5o> and <https://tinyurl.com/yaxwrztc>
- S4. variPlay website: <https://tinyurl.com/yalucnvy>
- S5 Email from Head of Creative and Digital at WMG, dated 16 June 2020.
- S6. See AHRC archive:  
<https://webarchive.nationalarchives.gov.uk/20200923120229/https://ahrc.ukri.org/newsevents/news/musicapp/>
- S7 Email from Langham Research Centre, dated 12 June 2020.