RiTA Is Not an Instrument

STEPHEN D. WOLFF, Brighton & Hove Music for Connection / Max Gate Digital Ltd, UK

The default assumption in Western musical culture is that an instrument is an object that a player uses to make music: one person, one instrument, one set of expressive possibilities. This paper questions this from the perspective of a practitioner working outside academia. Drawing on five years of practice with RiTA, a browser-based shared soundboard built for Brighton & Hove Music for Connection (BHMC), I describe something that was not designed as an instrument, but was recognised as one by the community's workshop facilitators. RiTA has no single player, no clear boundary, and no existence independent of the community it serves. It was built to help learning disabled musicians, older people, and refugees make music together during a pandemic, and it has since travelled to contexts including the British Library's *Unlocking Our Sound Heritage* programme and the National Trust's *Changing Chalk* project. Using RiTA as a case study, we argue that instruments are better understood as entanglements of people, sounds, spaces, and organisational structures than as objects. Applying Conway's Law, I suggest that different organisational structures naturally produce different kinds of instrument, and that widening the conversation about what instruments can be may require welcoming the organisations that produce them.

1 The Instrument Assumption

What is an instrument? The default answer, so deeply embedded in Western musical culture that it rarely needs to be stated, is that an instrument is an object that a player uses to make music. One person, one instrument, one set of expressive possibilities. This assumption is not limited to any particular community or conference. It runs through instrument design, music education, commercial product development, and everyday language. When we say 'she plays an instrument', no one imagines a group activity.

This paper questions that default, not because it is wrong, but because it is incomplete. There is a great deal of music-making that does not fit the model of one player with one instrument, and when we design only for that model, we leave much of it unsupported. NIME has been exploring this question with increasing depth, through work on accessible instruments, novice-friendly interfaces, networked and multi-user systems, collaborative interfaces, and participatory design [8, 9, 12]. What these strands share, despite their different starting points, is a willingness to shift the assumed unit of design away from 'one player, one object'. RiTA belongs in that broader conversation, but approaches it from the perspective of a community-music organisation rather than an academic research group, and it was built before it was theorised.

I did not set out to challenge anyone's definition of an instrument. I built a tool for a community music organisation during a pandemic, and the community's workshop facilitators started calling it an instrument. That surprised me and made me think about what the word means. What follows is the result of this thinking.

To see where the default assumption leads, consider a progression of instruments, each impressive, each well-intentioned, each encoding a slightly different assumption about who makes music and how.

Yamaha's Tenori-On, designed by Toshio Iwai, offered a beautiful and intuitive grid-based interaction model, a genuinely compelling instrument. It was manufactured, marketed, reviewed, praised, and yet it did not sustain a lasting community of practice. Its grid-based sequencing was based on a long lineage of hardware and software step sequencers, so the musical idea was well situated. What it perhaps lacked was ensemble thinking: no social affordances and no place in an existing community of practice. The Tenori-On arrived as a self-contained object for an individual player; that self-containment was precisely its limitation [1].

Jordan Rudess's GeoShred represents some of the most considered interaction design in the mobile instrument space, with sophisticated gestural control and real expressive nuance. Its marketing, tutorials and demonstrations typically feature a virtuoso (often Rudess himself) and its controls reward fluent, dextrous play. The framing is firmly individualist: a virtuoso tool for a virtuoso player. This isn't a criticism of the instrument so much as an observation about who it imagines as its player.

[1] Yamaha's own design retrospective frames the Tenori-On around individual play — 'an instrument that you want to try as soon as you touch it', with reverse-face LEDs 'for audience to see' — without mentioning ensemble use [18].

Author's Contact Information: Stephen D. Wolff, Brighton & Hove Music for Connection / Max Gate Digital Ltd, Dorset, UK.

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More recently, the jam_bot project at the MIT Media Lab [1], which explicitly cites Lewis's Voyager as an influence, took this further, training a generative AI model on Rudess's own MIDI improvisations to create a system that could accompany and interact with him in real time. The work is technically impressive, and the team's framing of 'symbiotic virtuosity' is thoughtful, representing a genuine attempt to rethink the relationship between human and machine in live performance. But the framing remained centred on augmenting a single exceptional performer. The audience watches; the virtuoso plays; the AI assists. The social dimension of music-making is still absent.

George Lewis's Voyager (1987–present) represents a different tradition entirely [11]. Voyager is an autonomous improvising system. Lewis expressly states that it is not an instrument and cannot be controlled by a performer. It analyses what musicians do in real time and generates its own independent responses. Crucially, Voyager emerged from the Association for the Advancement of Creative Musicians (AACM), a collective improvisation tradition in which music-making was already understood as social, non-hierarchical, and irreducible to individual expression. Voyager has endured for nearly four decades, performed by dozens of improvisers worldwide, because it was designed *into* an existing community of practice rather than *as* a demonstration of computational creativity.

But even Voyager assumes expert improvisers. It assumes performers who have already spent years developing a musical practice and who understand the conventions of free improvisation. The community it serves, while admirably non-hierarchical, is still a community of specialists.

The Elk Audio ElkLIVE project attempted to address the ensemble question directly, using genuinely innovative technology (sub-millisecond networked audio over commodity internet, deployed on embedded hardware inspired by the Bela platform) to bridge the gap for distributed rehearsing and performing. The engineering was remarkable. But the project struggled to build a large enough ecosystem of users and use cases around it. Technology alone, however well-executed, does not create the conditions for musical community.

Each of these examples is valuable. Each embeds at least one of these patterns to a greater or lesser degree, and together they make the default visible: that the people making music are assumed to be musicians already, that the instrument serves the individual, and that the social and ecological context is treated as separate from the design problem. What if the unit of design should not be the instrument at all, but the entanglement: the web of relationships between people, sounds, spaces, abilities, and circumstances in which something recognisable as music might (or might not) emerge?

This paper describes what happened when a tool was built from the entanglement outward. Iterative design is, of course, common when making novel instruments; what is distinctive here is that RiTA was built for a community that needed to make music together and could not.

2 RiTA Didn't Start as an Instrument

In 2020, Brighton & Hove Music for Connection (then called Open Strings Music) was a community music CIC already four years into an NHS commission as sole contractor to provide dementia-friendly music clubs, alongside weekly projects with adults with learning disabilities and other work. They were beginning to expand: sessions in care homes, listening walks, new participant groups.

The combination of listening walks, sound foraging, and live underscoring of archive clips was already part of BHMC's practice. *Sounds to Keep* (2019) at The Keep [2] is the most visible example. RiTA is, in part, what happens when that practice has to move online.

I knew the founder, Bela Emerson, and had been following their work. Then the pandemic closed everything down.

I had been circling these questions for a long time. My MA thesis at Middlesex in 1997, an interactive artwork called *Composition in Slow Motion* [16], explored what happens when the roles of composer, performer, score, and audience become entangled: a player's phrase became a visual symbol navigating toward a goal on a projected score, triggering serialist transformations of itself on arrival. Around the same time, I wrote 'Virtual Music Performance' for the zine *Noise Gate* [17], exploring how a string quartet might play together over ISDN lines. The questions were already relational: not what an instrument does, but what happens between people making music. So when BHMC's need arose, I was already inclined to think in those terms rather than to reach for an instrument-as-object.

I received a small government grant, what my friends call a 'Boris Bung', intended to cover office rent for my software consultancy. I wanted to give something to BHMC, to help them continue connecting people through music-making when they could no longer be in the same room. I made a financial donation, but what they needed was not money. They needed a way to make music together from separate places.

What we came up with was simple: a shared, browser-based soundboard. A grid of sounds that multiple participants could trigger simultaneously from different locations. No downloads, no logins, no musical knowledge required. We called it RiTA (Remix The Archive) because it worked with existing sound material rather than generating new content. It was, in some sense, a Tenori-On that had been turned inside out: instead of one player with a beautiful grid, many people sharing a basic one.

The design decisions were driven entirely by the community's needs. The interface had to work for learning disabled musicians, for older people unfamiliar with technology, and for participants joining from care homes on shared tablets. It had to be robust enough to survive poor internet connections. It had to be simple enough for a facilitator to run a session without technical support. Every decision that a conventional instrument designer might make on aesthetic or technical grounds (latency, timbral richness, gestural nuance) was subordinated to the question: can people actually use this together?

RiTA was not designed to be expressive. It was designed to be *available*.

This availability turned out to matter more than we expected. RiTA was used in BHMC's own sessions with learning disabled musicians and other participants. BHMC then used it for the Sound Mosaics workshops, part of a collaboration with Esther Gill of the British Library's *Unlocking Our Sound Heritage* programme and doctoral researcher Bethan Prosser from the University of Brighton, co-designed and co-delivered by Bela Emerson and Prosser [14]. Prosser's doctoral and post-doctoral research into gentrification had led her to experiment with listening and sound methods, and the partnership created the conditions for RiTA to emerge. RiTA was also used for the Interactive Listening Walk (ILW) project, again co-designed and co-delivered by Emerson and Prosser as part of Prosser's research, with listening walks moving online during the pandemic. During these early workshops, the facilitators started referring to RiTA as an instrument. I had not thought of it that way. I had built a tool, a shared soundboard, a way to make sounds together remotely. But the facilitators saw what was happening in sessions and recognised something instrumental about it: people were making music, and RiTA was what they were making it with.

Within months, the framing had become explicit. The Sound Mosaics evaluation report described RiTA as 'a new online instrument' [3], and a Workshop 2 session brought the point home: a participant who wanted to play their saxophone joined the RiTA grid live, and the report records that 'this also created a way of using RiTA to conduct and structure this blend of sounds and instruments.' The published account of the partnership reflects the same shift, noting that participants 'contributed to how we define and understand the tool' [14]. RiTA had become not only an instrument but a way of holding other instruments together. I had to think twice before accepting the idea, even though I had spent years considering the relationships between composer, performer, and audience. The word 'instrument' carried assumptions I was not sure RiTA deserved, or wanted.

Years later, BHMC delivered Sounding the Downs as part of the National Trust's *Changing Chalk* project: participants went on listening walks across the South Downs, collected sounds, and these recordings formed the basis for a RiTA room where the landscape could be collectively remixed. This also made the experience of the walks accessible to people who could not join them in person. None of these uses were anticipated in the original design. RiTA travelled because it was not a product looking for a market. It was a set of relationships looking for new contexts.

Two years after building RiTA, in 2022, I became a director of BHMC. The instrument had drawn me into the organisation rather than the other way around. This is not the usual trajectory of a technology project: designer builds tool, deploys it, writes paper, moves on. The tool and the community shaped each other. My involvement deepened *through* building and supporting RiTA, not before it. If instruments are entanglements, then RiTA entangled me.

3 What RiTA Reveals About 'Instruments'

I did not set out to make a theoretical argument. I set out to help people make sounds together during a pandemic. But with the benefit of hindsight and some belated reading, RiTA turns out to reveal several things about the assumptions embedded in digital instrument design, assumptions that are easier to see from the outside than from within.

RiTA has no single player. In the conventional NIME framing, an instrument implies a performer: someone with agency, skill, and intent who acts upon the instrument to produce musical expression. RiTA does not work like this. A RiTA session involves multiple participants triggering sounds on a shared grid, guided by a facilitator. There is no soloist. There is no audience. The distinction between 'player' and 'listener' collapses: everyone is both, or neither. What emerges is not individual expression but collective texture: something that belongs to the group and could not have been produced by any one member of it. This is not a failure of expressiveness. It is a different model of what music-making can be.

The instrument boundary is unclear. Where does RiTA end? The software is the obvious answer, but it is the wrong one. A RiTA session depends on a facilitator who chooses sounds, sets the pace, reads the room, and makes dozens of real-time decisions about when to intervene and when to stand back. It depends on the relationships between participants, their comfort with each other, their familiarity with the setting, and their willingness to contribute.

Compare two sessions. In a 2021 Sound Mosaics workshop, indoors, the grid was loaded with archive clips from the British Library, including the rural steam-engine driver saying 'oh this' and the French-accented Brighton hotel chef saying 'Christmas pudding' [14]. Facilitators used these to provoke memory and association. In a 2023 Changing Chalk session, the grid was loaded with field recordings from the South Downs: hydrophone recordings of a pond, reed warblers, wind in grass, and a participant remarking, 'I like being in an officey environment and being transported into nature'

[4]. Same software, two different instruments — not metaphorically, but in the sense that what the room can become is different in each case.

Pushed to its limit, the boundary disappears entirely. On a Stanmer listening walk in 2023, the session plan included a 'stone RiTA' listening spot: pairs of participants took turns to find sounds while the other listened through cones. The grid had not been opened. RiTA was already happening.

The software is a necessary condition for the music, but it is not a sufficient one. If the instrument is only software, then most of what makes a RiTA session musical is not part of the instrument. This seems like an impoverished definition. Better, perhaps, to say that the instrument is the whole situation, which Morrison and McPherson [13], drawing on Barad and Frauenberger [7], would call the entanglement and what Waters [15] describes as the web of sociality that makes instruments musical.

Design decisions encode values. Every instrument embeds assumptions about who will use it and how. Most music written for the piano assumes ten fingers, a specific hand span, and a tradition of Western harmony; Cage's prepared piano and other ways to extend pianos and techniques show how the instrument exceeds the assumptions of the music written for it. GeoShred assumes a virtuoso. Voyager assumes an experienced improviser. RiTA assumes none of these things. Its design values are availability, simplicity, and collective participation. The grid can be operated with a single finger, a switch, or an eye-gaze system. The sounds are pre-loaded, so no musical knowledge is needed to participate. These are not compromises made to accommodate disability. They are design choices that reflect a different set of priorities about what music is for. Bela Emerson, BHMC's founder, has described a possible use of RiTA in dementia settings: a seafront sound palette played on an iPad by someone who rarely gets to visit the seaside. The accessibility argument here goes past the obvious physical-access reading. RiTA's value in this case is not that it makes music-making easier; it is that it makes a place portable.

As Lepri and McPherson [10] argue, the values inscribed in music technology deserve scrutiny. RiTA makes this scrutiny easy because its values are on the surface rather than buried in technical decisions.

David Cope [6], whose EMI system could compose convincingly in the style of Bach, once observed that the feelings we get from listening to music are something we produce ourselves; they are not in the notes. Cope was talking about composition, but the insight applies to participation. The value of a RiTA session is not in the sounds the software produces. It is in the experience of producing them together. The sounds are a trigger; the music is social.

Instruments exist in ecosystems. Drake Music, the UK's leading organisation for disability and music technology, has spent decades developing accessible instruments and commissioning new ones. Their work demonstrates that instruments do not exist in isolation. They require facilitators, funding, venues, referral networks, and institutional support to reach the people who might use them. Bela, the open-source embedded audio platform co-founded by Andrew McPherson, appears on Drake Music's resources page precisely because it enables the creation of custom instruments for specific access needs. RiTA exists in a similar ecosystem: BHMC's network of care homes, community centres, and partner organisations is not separate from the instrument. It is part of what makes the instrument work. Designing an instrument without designing its ecosystem is like writing a song and assuming someone else will form the band.

4 Different Structures, Different Instruments

In 1967, Melvin Conway observed that organisations design systems whose structures mirror their own communication structures [5]. The observation was about software, but it has proven remarkably general. Conway's Law suggests that the shape of what you build is constrained by the shape of who builds it and how they are organised.

This applies to instrument design as much as to anything else. An academic research group, working in a university, producing papers and demonstrations for peer review, will naturally produce instruments that can be meaningfully presented in a 15-minute talk, evaluated in a user study, and documented in a six-page paper. A community music organisation, with facilitators working with participants, trustees managing resources, and partners providing contexts, will naturally produce something different. Neither structure is wrong. They simply produce different things.

RiTA is not a better instrument than those designed within academic research. It is a different *kind* of thing, one that could only have emerged from a different organisational structure. BHMC is a community interest company, not a research group. Its communication structure involves facilitators, participants, trustees, partners, and a developer embedded in the organisation's governance. The instrument that emerged mirrors this structure: distributed, collectively operated, shaped by facilitation rather than performance, accountable to participants rather than reviewers. Conway's Law would predict exactly this.

The relationship runs in both directions. The same evaluation report records that working on RiTA 'helped us conceptualise new listening practices' and 'developed the use of sound samples as instruments and within sound foraging' [3]. The instrument did not just emerge from the organisation; it changed what the organisation became capable of imagining.

The implication is not that any particular approach to instrument design is lacking. The reason is that different instruments require different organisational conditions to emerge. If we want instruments that serve communities rather than individuals, that embed in ecosystems rather than existing as standalone objects, that value availability alongside expressiveness, then we need to make room for the kinds of organisation that produce them. This means valuing practice-based contributions alongside technical ones and recognising that a ten-year community music programme might constitute a significant contribution to the understanding of what instruments can be.

alt.nime, in this light, is an invitation to widen the conversation, to include voices and structures that produce instruments the existing formats might not easily accommodate. This paper is offered in that spirit: not as a critique, but as evidence from a different kind of practice.

5 Media and Presentation

At alt.nime 2026, this paper will be accompanied by an 8-minute live presentation in which audience members are invited to join a shared RiTA room from their own phones while the author facilitates from the stage.

In keeping with alt.nime's invitation to experiment with presentation format, the aim is to create a situation rather than just describe one.

6 Ethical Standards

This paper describes practice-based work with Brighton & Hove Music for Connection (BHMC), a community interest company (CIC no. 08988791) of which the author is a director. RiTA sessions involve musicians, older people, refugees, and mental health support groups. In this paper, no participant data is reported. The author's dual role as developer and director is disclosed throughout the paper rather than treated as a methodological limitation; the entanglement of these roles is part of the argument.

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