Making Worlds, Worlding Metaverses
A Comparative Study of Metaverse Developers and Users in Italy*

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Abstract

This article examines how the metaverse is locally enacted and imagined in Italy, offering a situated perspective that moves beyond dominant corporate framings. While existing research has documented how platform power around the metaverse is consolidated by firms such as Meta, Apple, and Nvidia, far less attention has been paid to actors, practices, and contexts that remain largely *off the map* of both global metaverse narratives and the critiques directed at them. Drawing on ethnographic fieldwork that combines in-person and in-metaverse research with Italian developers and user communities, the study explores how the metaverse is defined, practised, and made meaningful within Italy's mid-level innovation economy. Through the notion of worlding, we trace how global metaverse narratives are appropriated, modified, or unevenly engaged with in practice, giving rise to a plurality of actually existing metaverses shaped by divergent temporalities, value regimes, and infrastructural dependencies. In doing so, the article contributes to decentring dominant imaginaries of digital futures by showing how the metaverse takes form through situated negotiations within – rather than outside of – global platform power.

Keywords:
Metaverse; Worlding; Italian developers and users; Actually existing metaverses; metaverse operative imaginaries

1. Introduction: The Metaverse Is Dead, Long Live the Metaverse!

When Mark Zuckerberg delivered his landmark metaverse keynote, he appropriated and reframed the term 'metaverse' to announce what he described as the "next chapter of the internet" (Zuckerberg, 2021). Zuckerberg's vision has since lost much of its momentum, and the metaverse – at least in the capital-M form most closely associated with Meta – has been widely dismissed as a "digital delusion" (Murray, 2025) or even declared dead (Kobie, 2025). While such claims may well apply to Meta's branded version of the metaverse, they do not fully capture how the metaverse persists and is reconfigured under new forms and names. Recent market analyses project substantial long-term growth in metaverse-related industries (e.g., PS Market Research, 2023; IMARC Group, 2024), and major technology firms remain actively engaged in building the infrastructures, platforms, and standards

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through which the metaverse continues to be developed, including Meta itself alongside initiatives such as Nvidia's Omniverse and Apple's spatial computing ecosystem.

Against this backdrop, the tension between declining public enthusiasm for Meta's metaverse and ongoing development at Meta and elsewhere underscores that the metaverse is not a singular or settled object. Rather, it constitutes a contested and plural sociotechnical domain, one shaped by competing technologies, corporate strategies, and investment trajectories. As the concept has moved beyond Meta's original framing, it has come to encompass a heterogeneous constellation of technologies, platforms, and projects. As a consequence, today 'the metaverse' refers less to a unified platform or corporate vision than to a range of developments across virtual reality (VR), augmented reality (AR), extended reality (XR), spatial computing, wearable technologies, gaming ecosystems, and digital twins – often in overlapping or hybrid forms (Boellstorff, 2008; Castronova, 2005; Evans, 2019; Harley, 2024)

Yet, this apparent diversification should not be mistaken for a corresponding dispersal of power. Despite the increasing plurality of metaverse discourses and initiatives, and the growing number of actors involved, the metaverse – understood here as a sociotechnical and economic domain – remains, in practice, highly concentrated (Ball, 2022). Control over core infrastructures, platforms, and capital continues to be exercised by a small number of Big Tech firms (Smith, 2024). This structural concentration has, in turn, shaped the trajectory of much critical scholarship on the metaverse, which has largely focused on the ambitions and influence of dominant actors such as Meta, Apple, and Nvidia (e.g., Blackman & Harley, 2024; Egliston & Carter, 2020, 2024; Mosco, 2023; Smith, 2024). While this body of work has productively foregrounded concerns around platform expansion, datafication, surveillance, and the normative imaginaries promoted by Big Tech firms (Hesselbein, Bory, & Canali, 2024; Lupinacci, 2023), it has left other dimensions comparatively underexamined – particularly how the metaverse is taking shape across a wider range of actors, scales, and geographies.

To fill this gap, this article advances empirical and conceptual understanding of the metaverse by examining how it is talked about, built, experienced, and anticipated in Italy – a mid-level innovation economy embedded in global circuits of capital and expertise, yet shaped by small enterprises, research and development laboratories, and user communities. Drawing on ethnographic fieldwork that combines in-person and in-metaverse encounters (Boellstorff et al., 2013) with participants in Italy's metaverse ecosystem, this study focuses on two key groups: developers and users. By *developers*, we refer broadly to start-up founders, software engineers, digital strategists, marketing analysts, and other professionals involved in the conceptualisation, production, and circulation of metaverse-related technologies and imaginaries. By *users*, we refer to individuals who actively participate in metaverse platforms and the Italian communities that have formed around them. Although this developer–user distinction does not fully capture the heterogeneity of the actors involved and has been problematized in technology studies (e.g., Turkle, 1984), we adopt it as a pragmatic heuristic to structure data collection and analysis, while remaining attentive to different forms of engagement and expertise both between and within these groups. Importantly, invoking these categories does not imply that developers and users occupy symmetrical positions within a single technological system, nor that they map onto a simple producer–consumer relationship. Rather, our material shows that developers and users largely operate in distinct domains that intersect only intermittently: the former primarily within business-to-business (B2B) circuits, and the latter through consumer-facing

platforms such as VRChat, Spatial, Bigscreen, and Horizon Worlds. Nevertheless, this disjunction proves analytically generative, as it helps show how, in the Italian context, the metaverse materialises across multiple, partially disconnected sites of production and use, within which its meanings, forms, and futures are continually enacted, negotiated, and reworked in practice.

By focusing on these local enactments and imaginaries (Taylor, 2004), our aim is to shift analytical attention away from singular, monolithic understandings of the metaverse – both conceptually and operationally – and toward the more heterogeneous ways in which it comes to *matter* in contexts outside dominant centres of platform power. Importantly, although our approach resonates with recent calls to *decentre* metaverse research beyond Big Tech–centric frameworks (Girginova, 2025), it should not be mistaken for an account of 'alternative' or oppositional metaverse projects. The Italian case examined here does not constitute a space apart from dominant Big Tech–led metaverse initiatives, nor does it necessarily represent a politically oppositional formation. In this respect, it differs from activist interventions that explicitly seek to reimagine the metaverse as a more inclusive, intersectional, or decolonial environment (e.g., Ramírez et al., 2024), as well as from artistic or independent endeavours that "often purposefully forgo direct economic functions" (Girginova, 2025, p. 301). Instead, the metaverse in Italy takes shape through engagements that are simultaneously peripheral and structurally dependent on Big Tech–dominated ecosystems. As we shall see, developers pursue profit-oriented, primarily B2B applications by developing proprietary metaverse experiences and products, while remaining structurally dependent on partnerships with major hardware and software providers. Users, in turn, engage primarily through consumer-facing platforms such as VRChat and Horizon Worlds, accessed via devices and operating systems controlled by large technology firms.

The rest of this paper is organised as follows. Section 2 reviews existing debates on the metaverse, situating our contribution within broader efforts to expand analytical focus beyond global technology corporations. Section 3 introduces the Italian case and outlines our methodological approach. Sections 4 through 6 present the analysis, organised around three themes: the definitions of the metaverse in circulation; the material platforms, communities, and practices through which it is enacted (*actually existing metaverses*); and the expectations that shape its development and imagined future (*metaverse operative imaginaries*). Section 7 concludes with reflections on the implications of our study for understanding the metaverse as an evolving sociotechnical formation and its contribution to broader debates about digital futures.

2. Situating the Metaverse: From Global Visions to Local Worldings

In recent years, the metaverse has generated a substantial body of commentary, marked by both fascination and scepticism. Across academic, journalistic, and industry contexts, early debates largely centred on the *grand narratives* promoted by major technology corporations. A central concern has been how the metaverse is framed as both a technological rupture and the inevitable successor to the mobile internet – an imagined evolution that would further entrench Silicon Valley's dominance *in* and *through* "persistent and immersive virtual environments or 'worlds' in which a range of professional, social, and leisure activities will purportedly take place" (Hesselbein et al., 2024, p. 780)

Critical scholarship has challenged these claims by demonstrating how libertarian "imaginaries of deterritorialized life" (Lynch & Muñoz-Viso, 2023, p. 67) that underpin metaverse discourse function to naturalise and consolidate platform power (Egliston &

Carter, 2020; Lucia et al., 2023). Mosco (2023) situates such imaginaries within a longer genealogy of the "digital sublime" (Mosco, 2005), which the metaverse reprises by promising transcendence and socio-political renewal, while obscuring the infrastructures and power relations that sustain it – from energy-intensive data centres to proprietary standards and governance protocols. A salient example can be found in Meta's promotion of the now-discontinued Oculus Rift headset, which Egliston and Carter (2020) characterise as the production of *Oculus imaginaries*. While these imaginaries position immersive technology as a domain of connection and creative freedom (Lucia et al., 2023), they simultaneously function to enrol users into Meta's vertically integrated hardware–software ecosystem, thereby consolidating forms of platform lock-in. Blackman and Harley (2024) similarly examine the visual imaginaries mobilised within Apple's Vision Pro campaign, showing how its promotional repertoire idealises affluent, able-bodied users, while normalising monetisable forms of data capture and spatial mediation.

Alongside this discursive critique, research across media sociology, platform studies, and science and technology studies has increasingly turned to the metaverse's material, spatial, and infrastructural dimensions. This includes analyses of how corporate visions materialize through what Hesselbein and Bory (2025) term *metaversification*, producing the "geographies of the metaverse" that Jones (2023) conceptualizes as spatial formations constituted through technological, infrastructural, and political-economic relations. Within these formations, technological experimentation is closely intertwined with data extraction, extending and intensifying established regimes of commodification and surveillance (Hesselbein et al., 2025; Lupinacci, 2023). This material orientation is especially evident in studies of *enterprise* or *industrial* metaverses (Abraham et al., 2022). Focusing on what he calls the 'metaverse-industrial complex', Smith (2024), for example, shows how Nvidia consolidates infrastructural power by leveraging its dominance in GPU manufacturing and embedding its proprietary Omniverse platform across industrial workflows, thereby positioning itself as a critical – and increasingly unavoidable – intermediary.

Collectively, this scholarship has significantly deepened understanding of the economic and infrastructural concentrations of power underpinning the metaverse. At the same time, however, its predominant focus on global corporations risks reinforcing the very totalising assumptions it seeks to critique by recentring these actors as the primary locus of analysis. In response, recent work has called for more local and situated perspectives on the metaverse (Ramírez et al., 2024). Girginova (2025) captures this shift, arguing that "instead of starting with Meta's all-encompassing vision of the metaverse […] we ought to consider other temporal visions and combinations of technological metaverse assemblages in their own right" (p. 302). Taking up this call, our study explores how small enterprises and user communities in Italy negotiate meanings, uses, and aspirations around the metaverse through their everyday activities. In so doing, our aim is not only to document these initiatives, but also to use them to reconsider what the metaverse *is*, *does*, and *might become* when approached from perspectives other than those of global corporate production.

To conceptualise this plurality, we turn to the notion of *worlding*, which offers a way to understand how different metaverses – and we use the plural intentionally – are articulated in discourse, enacted in practice, and projected into imagined futures. Although the term has multiple genealogies, from Heidegger's (1971) phenomenology to postcolonial theory (Spivak, 1988) and feminist thought (Haraway, 1991), we employ it here in a deliberately double sense. First, worlding – sometimes used interchangeably with 'worldbuilding' (Martin & Sneegas, 2020) – refers to the creation of *imaginary worlds* "with coherent

geographic, social, cultural, and other features" (Von Stackelberg & McDowell, 2015, p. 25). Understood in this way, worlding functions as a speculative or escapist practice (Tolkien, 1983), opening up space for re-envisioning social life. Second, worlding designates an epistemic and political process through which particular discourses and practices attain global authority and circulation, crystallising as taken-for-granted reference points against which alternative possibilities appear marginal or peripheral (Burns et al., 2021). Worlding, in this sense, is not merely about the fabrication of worlds, but about the production of what comes to count as *the* world (McCann, Roy, & Ward, 2013).

Corporate metaverse visions such as Zuckerberg's illustrate the articulation of these two senses of worlding particularly clearly. When he claims that "while this may sound like *science fiction* … a lot of us will be *creating and inhabiting worlds* that are just as detailed and convincing as this one" (Zuckerberg, 2021, 09:21, emphasis added), he carries over the fantasy of speculative worldbuilding into a concrete technological project, or what Alvarez León and Rosen (2025) describe as *virtual landmaking*. Importantly, as these claims circulate across media and industry discourse, they also participate in the epistemic sense of worlding by presenting a particular vision of the metaverse as universal and inevitable, thereby marginalising other possibilities.

At the same time, worlding is not confined to Big Tech. Beyond the visions advanced by major technology firms like Meta, smaller enterprises and user communities in our study also engage in world-making through their development, use, and imagination of immersive technologies. In doing so, they articulate their own understandings of what the metaverse is for, how it should be used, and the kinds of futures it might enable. Importantly, although these engagements unfold within ecosystems structured by dominant platforms and infrastructures, they cannot be reduced to Big Tech–centric visions alone.

It is from this perspective that we approach our analysis as an exercise in "provincializing" (Chakrabarty, 2000; Burns et al., 2021) dominant metaverse discourse. Focusing on the case of Italy, we foreground actors and contexts that typically remain 'off the map' of both dominant global metaverse narratives and the critiques directed at them. This enables an examination of metaverse understandings, practices, and imaginaries from underexplored vantage points, both geographically and in terms of the actors involved. In doing so, we do not seek to advance a normative critique of hegemonic metaverse models, nor to evaluate alternative ones. Rather, our study entails approaching the metaverse from new "loci of enunciation" (Sheppard, Leitner, & Maringanti, 2013), attending to perspectives articulated by actors marginal to prevailing metaverse debates. Importantly, what renders our case study 'provincial' should not be understood as denoting separation or autonomy, but as reflecting uneven visibility and access to resources in relation to Big Tech firms. As Italian developers and users work out their visions in and through their everyday practices, they remain largely dependent on Big Tech–controlled infrastructures, platforms, and hardware. These dependencies both enable and constrain local practices and imaginaries, giving rise to locally specific ways of making and experiencing metaverses that resist simple centre–periphery or corporate–countercultural distinctions.

Exploratory in orientation, our analysis adopts an ethnographic and descriptive approach, in which both talk and material artefacts – such as platforms or applications in use and development – are treated as discursive formations in their own right, insofar as they give material form to particular understandings and expectations of the metaverse. We thus approach worlding as it unfolds across three interconnected registers. The first is *definitional*,

involving the conceptual and discursive work through which actors articulate what the metaverse is – or is not – and, in doing so, turn definition itself into a site of negotiation. The second is material-practical, asking which metaverses developers are building and users are experiencing in the Italian context, and how these diverse, *actually existing metaverses* take shape through technologies, applications, and everyday engagements. The third is imaginary-ideological, concerning what we conceptualise, following Meyer (2025), as *metaverse operative imaginaries* – namely, the "ideological fantasies generated by technological possibilities" (p. 4) that shape both current developments and collective expectations, as well as the perceived impediments to their realisation. These three registers structure the analysis that follows, corresponding respectively to Sections 4, 5, and 6 of the article. In the next section, we outline the methodological approach that grounds this analytical framework.

3. Methodological Framework

Our methodological approach draws on principles of multi-sited and connective ethnography (Marcus, 1995; Hine, 2015). Fieldwork unfolded along two parallel strands – one centred on developers and one on users – which proceeded separately while informing one another throughout the study. We refer to this arrangement as a *dual-track design* to indicate that these groups do not necessarily inhabit the same settings or organise their practices around the same concerns. This approach enabled us to trace how the metaverse circulates across multiple sites of technological development and everyday use, while attending to the different forms of expertise and engagement that shape its local enactment.

3.1 Sampling Strategy and Sample Composition

Our sampling strategy followed directly from this dual-track design. Because developers and users engage with the metaverse in different ways and in largely separate settings, we sought participants who could speak to these distinct modes of involvement. Our aim was not to build a strictly symmetrical comparison between the two groups, but to capture the heterogeneity that exists both between and within them, spanning organisational and professional perspectives, as well as creative experimentation and everyday participation. To do so, we began with a purposive selection of key figures whose experience was directly relevant to the study (Bryman, 2016), followed by snowball recruitment through which the sample grew via participants' interpersonal networks (Biernacki & Waldorf 1981).

Developer sample

The developer sample represents a cross-section of Italy's innovation ecosystem, including start-ups and established firms working in market research, XR development, digital transformation, medical technology, cultural promotion, and academic research. We concentrated on senior figures – CEOs, CTOs, founders, and marketing managers – not to privilege managerial viewpoints, but because these actors shape investment decisions, establish partnerships, and articulate strategic narratives about the metaverse in the Italian context. Focusing on leadership inevitably narrows the view of everyday development practices, and we acknowledge this as a limitation. Our goal, however, was to understand how organisational visions of the metaverse are formulated and circulated, and this level of seniority offers insight into those processes.

User sample
The user sample was constructed through a two-phase process combining digital observation, purposive selection, and snowball recruitment. Initial observation in Facebook and Telegram groups enabled us to identify key informants, including community managers and experienced users, selected for their expertise, influence, and willingness to facilitate access. Through their networks, we recruited participants from six Italian virtual communities spanning gaming, social, creative, and cultural domains. The final sample included content creators, environment builders, and active users, selected to reflect diversity in gender, age (from digital natives to older technology enthusiasts), community affiliation, and technical proficiency.

3.2 Data-Collection Methods

Our data were generated through two principal methods – semi-structured interviews and participant observation – conducted between 2024 and 2025.

Interviews

We conducted 24 semi-structured interviews – 12 with developers and 12 with users. This balanced design ensured analytical parity between the two groups, consistent with Guest et al.'s (2006) guidance on thematic saturation and variability. Interviews typically lasted about one hour, allowing participants sufficient time to articulate their experiences and perspectives. The interview protocols were designed to enable systematic comparison, while remaining sensitive to the distinctive forms of knowledge in each group. Rather than imposing a rigid structure, interviews took the form of guided conversations organised around four thematic areas identified through preliminary fieldwork and engagement with the literature: definitions of the metaverse, current practices and experiences, future imaginaries and aspirations, and perceived constraints and resource needs. Questions were adapted to match each group's expertise and vocabulary, allowing discussions to unfold in a participant-led manner.

Participant Observation

Developers
Participant observation focused on business and industry events where developers from small start-ups and established firms presented their work, debated technological directions, and connected with peers. These settings offered insight into professional networks, entrepreneurial initiatives, and academic–industry collaborations, and facilitated interview recruitment through direct engagement with presenters and attendees.

Users
User observation consisted of three complementary components designed to capture different modalities of metaverse engagement. The first involved digital observation in Facebook and Telegram groups, tracing how users make sense of their metaverse activities through exchanges about hardware, troubleshooting, and platform preferences. The second entailed avatar-mediated participation in *Second Life* (Boellstorff et al., 2013),

recognising that many Italian users – especially older cohorts – continue to regard long-standing virtual worlds as integral to what the metaverse is. The third component involved immersive VR ethnography using Meta Quest 3 headsets within platforms such as Spatial, VRChat, and Bigscreen, providing phenomenological insight into embodied virtual experience. Following Kozinets' (2022) framework for immersive netnography, this tiered approach illuminated complementary dimensions of user engagement, from discursive construction to embodied practice.

4. What counts as 'the Metaverse'?

Systematic comparative analysis of how developers and users define and delimit the metaverse reveals that what constitutes 'the metaverse' in the Italian field is not a matter of discovering essential properties, but an ongoing process of boundary work performed by differently positioned actors. Through examination of definitional practices across 24 interviews, we identify a pattern in which strong agreement around a shared core coexists with deep differences over what qualifies as a genuine metaverse experience. The same technological assemblage accommodates divergent interpretations of its purpose and trajectory, reflecting the heterogeneous positions of actors within Italy's metaverse ecosystem – a peripheral innovation context where global technological paradigms meet local appropriations.

4.1 Shared foundations: core definitional dimensions

Although these attributes are articulated through registers reflecting each group's relationship to metaverse technologies, both developers and users demonstrate striking convergence around three core dimensions that anchor their definitions, namely immersivity, sociality, and persistence.

Immersivity emerges as non-negotiable across both groups. Users frame immersivity through phenomenological language emphasizing embodied co-presence: *"The metaverse is a persistent online digital universe composed of virtual worlds and social VR platforms – an immersive, three-dimensional environment experienced via an avatar in co-presence"* (U3).[1] Developers articulate immersivity by specifying technological modalities and claiming experiential enhancement: *"The metaverse is any immersive reality platform – be it augmented, virtual, or mixed – where you can experience a reality superior to the real one through virtual elements [...] where you live, not just play or work"* (D4).

These articulations of immersivity extend to ongoing debates about hardware requirements, revealing how peripheral innovation contexts navigate between technological aspirations and material constraints. Users engage in heated debates about whether metaverse experience requires VR headsets or can be achieved through screen-based platforms. While many consider VR optimal for achieving full immersion – *"VR is the primary way to feel it 'all around'"* (U1) – others defend the experiential validity of screen-based access based on community practices: *"Many metaverse residents don't consider it a metaverse if there isn't the possibility to use VR. Yet there are communities born without headsets even in a world created for VR"* (U3). This position draws authority from phenomenological evidence: *"VR certainly gives you an experience that is exponential compared to computers... Yet no one more than*

[1] All interviews were conducted in Italian. The excerpts cited here and throughout were translated into English by the authors.

us, Second Life residents, can understand how much even with a computer you can have an immersive experience... I remember them as real-life experiences" (U3). The claim that screen-based virtual experiences can produce memories phenomenologically equivalent to physical presence challenges dominant assumptions about immersion requiring head-mounted displays, revealing how Italian users appropriate global technologies through situated practices that prioritize experiential outcomes over hardware specifications.

Avatar-mediated presence emerges as crucial to immersive experience. One user establishes the avatar as an absolute requirement: *"I'd really put a veto on this – you couldn't conceive of a metaverse if you enter in a Doom-style mode where you never see yourself"* (U3). The ontological status of virtually worlded relationships emerges as a central phenomenological concern, particularly regarding the reality status of digitally mediated social bonds. During an interview conducted within a virtual environment using the Bigscreen platform, one participant articulated this tension between virtuality and reality by directly referencing the interviewer's avatar presence: *"The metaverse is a virtual reality... it's a reality but it's virtual, in the sense that for me you are a person. Right now, I see an avatar, so I don't see a physical person, but I see an avatar. I see the person projected in the metaverse, but I respect you as if I were seeing a real person, because for me behind this avatar clearly there's a person. So I live the metaverse as a reality, virtual, but it's a reality. Instead of going to the bar to drink with my real friends, I come here and talk with my virtual friends... but they are my friends"* (U10). This testimony reveals how sustained virtual inhabitation transforms mediated presence into genuine social reality, with relationships formed through avatars experienced as ontologically equivalent to physical-world friendships despite participants' explicit acknowledgment of their virtual character.

Sociality constitutes another fundamental dimension. One user deploys an evocative aquatic metaphor – a constant in the imaginary of immersiveness (Murray 1997; Pinotti 2025) – describing the Metaverse as *"a puddle of water – people walk past and ignore it; under the microscope it teems with life; once you step in you find a world that is alive 24/7"* (U8). Developers specify technical affordances enabling social interaction: *"I'd define it as a digital virtual world you can enter with technological devices ... to experience firsthand social interaction, entertainment, cultural deepening"* (D7). Persistence proves crucial to both groups' definitions, though users emphasize what we term "inhabited persistence" – not merely technical availability but actual community vitality creating reasons to return. One user articulates this distinction bluntly: "If I log in, take a look, and leave – that isn't a metaverse to me" (U7). Another user states categorically: *"It's fundamental that it is persistent. If I have an application on a USB flash drive ... for me that is not a metaverse. In those virtual places, anyone must be able to enter 24/7"* (U3). Developers echo this emphasis on continuous accessibility: *"the key principle is that this environment was not designed exclusively for you, but is accessible by anyone at any time"* (D2).

4.2 Divergent purposes: market viability vs. community inhabitation

Beyond shared definitional foundations, developers and users attribute fundamentally different values to metaverse technologies, revealing structural tensions between market-driven and community-oriented worlding practices. Developers' definitional work also reveals different concerns about market viability and sustainable business models. The most significant divergence concerns the consumer versus industrial bifurcation. One developer articulates this split: *"Right now there are two types of metaverse. A metaverse connected more to consumers ... We however work on another type of metaverse, the industrial metaverse, where we're vertical on products, training, digital twins, data interpretation"* (D1). Another provides a frank

assessment: *"What happened in recent years is that the metaverse, understood as a B2C virtual world where people enter and spend time, has gradually fallen into disuse – it hasn't caught on as imagined. What has caught on is application of these technologies in B2B contexts"* (D8).
Another topic, only touched upon by developers, is temporality. One articulates: *"In B2B it means people use them for limited time, for well-defined objectives or activities – I go to the office, put on a headset for meeting, finish meeting, remove headset"* (D8). This task-oriented conception contrasts sharply with users' vision of persistent inhabitation. Industrial metaverses operate by different success criteria. Return on investment becomes the primary metric: *"At a professional level these technologies have very practical utility... First, you can do things you otherwise couldn't; second, you get huge cost savings"* (D1).

4.3 Peripheral dependencies: hardware constraints and corporate infrastructures

Hardware friction emerges as a dual constraint in developers' accounts, limiting both their technical ambitions and user adoption potential. One developer diagnoses the consumer adoption challenge: *"Current VR headsets are very mature, work very well, but haven't demonstrated having characteristics to truly create user dependence and become necessary devices like mobile phones ... then stickiness in consumer usage habits isn't there"* (D8). He describes how the adoption pattern repeatedly fails: *"The trend is always the same. You play at the beginning and become passionate. During Covid I played because I was locked at home. It was super cool. Then ... at a certain point I stopped using it and now it lies in the drawer"* (D8). Another developer elaborates on technical limitations: *"Everything we do is limited by technology. We could do incredible things but unfortunately can't because we must interface with a device. An XR tool must be easy to use and easy to access; if those two rules aren't met, it can't be sold on the market"* (D2). A third one acknowledges multiple hardware barriers: *"There are three main factors: battery duration, motion sickness, and overheating. After an hour/an hour and a half, the device starts heating up and becomes uncomfortable on the face"* (D1).
These technical limitations affect Italian metaverse practices across both B2B and B2C contexts. For developers, hardware constraints determine which client solutions prove commercially viable. For users, device costs and comfort issues shape adoption patterns and community participation. Unlike Silicon Valley contexts, where developers might access prototype hardware or influence manufacturer roadmaps, Italian actors must adapt to devices designed for global markets, accepting technical limitations and release schedules determined elsewhere. This peripheral positioning means innovation occurs through creative appropriation of existing platforms rather than through direct technological development – Italian developers and users work within hardware capabilities determined by Meta, Apple, Microsoft, and other major corporations, rather than defining those capabilities themselves.

4.4 Epistemic ambivalence: pragmatic use despite definitional scepticism

Despite differences between users and developers in their understanding of the fundamental dimensions of the metaverse, both express deep scepticism while continuing to use it. This shared ambivalence reveals how peripheral innovation contexts negotiate with globally circulating concepts that may not accurately describe local practices yet prove strategically necessary for market positioning and community visibility.
Developers express frustration: *"I've stopped trying to define it ... the term has slid into marketing"* (D8). One offers a sharp historical perspective: *"I've been digesting all metaverse hype somewhat reluctantly for ten years. Those defined as metaverses already had labels before – they were called virtual social worlds"* (D8). Even more provocatively: *"Bulk of users are gamers and they're not there to be*

in the metaverse – in fact, if you told them they're in the metaverse, they'd be offended and leave" (D8). Some users express similar discomfort: *"Like trying to define a mythical creature – it doesn't exist"* (U4); *"I've never liked calling it the 'metaverse' – it feels tied to what Zuckerberg wants"* (U11).
This epistemic ambivalence reflects more than semantic disagreement. For Italian actors, "metaverse" serves as a strategic term enabling market participation and community formation within globally structured ecosystems, even when it poorly describes actual practices. Developers employ it when pitching to clients who recognize the term from international discourse, despite preferring more precise technical categories. Users deploy it when establishing community identity within platform architectures designed around global corporate visions, despite reservations about corporate associations. The term's contested status thus reveals how peripheral innovation contexts must navigate between local practices and global frameworks – using terminology shaped by Silicon Valley narratives to describe Italian formations that diverge from those narratives in fundamental ways.

Beyond shared foundational agreements and strategic ambivalences, the divergences reveal how differently positioned actors appropriate shared technologies toward distinct ends. Users privilege inhabited persistence and social vitality as markers of authentic metaverse experience, while developers prioritize market viability and functional utility as criteria for sustainable implementation. The definitional landscape thus reveals not a coherent object called 'the metaverse', but rather a contested field where multiple metaverse-visions coexist, sharing vocabulary, while pursuing purposes that sometimes align, sometimes diverge, and sometimes generate tensions requiring negotiation. What developers dismiss as unmarketable social experimentation may constitute precisely the community formation sustaining user engagement; what users experience as corporate enclosure may represent economic infrastructure enabling platform viability, though not necessarily on terms users endorse. The metaverse thus emerges through ongoing negotiation between economic necessity and social possibility: neither purely market-driven nor entirely autonomous from economic imperatives.

5. Actually existing metaverses

Having examined how developers and users define the metaverse through competing criteria and thresholds, we now turn to how these definitional tensions materialize into concrete platforms, communities, and practices. To do this, we will retrieve the concept of *actually existing metaverses* which does not refer to one empirical condition, "but rather designates multiple and uneven social and technological arrangements" (Gabrys et al., 2024, p. 213) that may or may not counteract dominant visions. The Italian case presents particularly revealing terrain where global technological aspirations meet local formations, producing hybrid arrangements that illuminate the processes through which diverse metaverses are actively made – or *worlded* – through situated practices, rather than predetermined by design specifications. Its landscape of actually existing metaverses manifests the asymmetry between developer and user orientations identified in definitional discourse. Indeed, while developers translate their B2B definitional priorities into industrial applications driven by immediate return on investment requirements, users engage in sustained worlding practices that create social environments oriented toward leisure, creativity, and community formation.

5.1 Big Tech ecosystems: partnerships and local adaptations

These divergent worlding practices unfold within shared infrastructural dependencies that complicate narratives of peripheral autonomy. Both developers and users indeed operate within ecosystems dominated by a small number of global technology corporations, whose hardware and software choices fundamentally shape local possibilities.

Italian developers articulate their dependency through direct partnership relationships with Big Tech platforms. One describes how big tech corporations structure the sector: *"We are partners of all these companies ... whether in development programs, as partners, or even as resellers, because we resell both Meta and Pico products, which are currently the two most commercially widespread visors"* (D1). Another confirms this integrated supply chain: *"We have been hardware suppliers for about a year now, because we were chosen by Meta as its official reseller for Italy and recently, in 2024, also by Pico and Pimax"* (D5). These partnerships position Italian firms simultaneously as clients, distributors, and advocates for Big Tech platforms, creating economic interdependencies that structure development priorities. The hardware provision role proves particularly significant, as developers cannot pursue industrial metaverse applications without access to devices manufactured exclusively by Meta, Apple, Microsoft, and their competitors.

Corporate investment decisions function as market signals legitimating continued commitment to immersive technologies. One developer articulates this dependency explicitly: *"Big tech plays a central role [...] First, because they invest billions every year in these technologies, and this helps us create a base for our clients, saying: these big tech companies are investing, you understand it will certainly be a sector that won't have a beginning and end in the short term"* (D1). When hardware manufacturers cease production of specific devices, peripheral actors face immediate constraints. Microsoft's termination of HoloLens production exemplifies this fragility: *"Microsoft ... has discontinued the holographic visor it had on the market, the HoloLens ... it came out of the market, no longer commercialized ... and this certainly is missing from the market at the moment"* (D1). Italian developers faced constrained options, awaiting alternative manufacturers. Another developer positions Apple's Vision Pro launch through similar logic: *"If Apple came out [...] with this move it gave a helping hand to all those who believe in the world of headsets to have one more hope for the future. Because if Apple came out, there's a light at the end of the tunnel that tells you you're doing the right thing*" (D2).

Users experience comparable dependencies, yet mediated through hardware ownership, rather than business partnerships. Ethnographic observation revealed how Meta's market dominance produces linguistic and cultural effects extending beyond technical specifications. In community names and everyday discourse, 'Meta' often serves as shorthand for VR technologies as a whole, a synecdoche in which a corporate brand stands for the broader ecosystem of immersive technologies. One user describes Meta's strategic positioning: *"Meta has made the operating system open source, which will have the same impact as Android ... Samsung and others are building their hardware using Meta's operating system. This move by Meta has brought others to react"* (U8). Yet this infrastructural centrality generates ambivalence rather than passive acceptance. While Meta Quest devices dominate Italian VR communities as the most accessible entry point, users voice unease about corporate consolidation. Some community names explicitly incorporate 'Meta' not in celebration but as a territorial marker acknowledging inescapable corporate presence.

Beyond hardware dependencies, developers navigate regulatory constraints specific to peripheral contexts. Many described regulatory uncertainty as a persistent challenge, noting

that the absence of clear frameworks often left their work in a legal grey area. Others pointed to sector-specific restrictions that delimited what could be built or displayed. This became especially apparent during a professional event where a speaker from the gambling industry reflected on the tension between creative experimentation and compliance. Although companies were free to explore new forms of storytelling, their possibilities remained narrowly defined by Italy's stringent regulation of the field.
These regulatory constraints ultimately shape the conditions under which peripheral actors operate, as local experimentation must contend with state and sector-specific regulation that structures what can be built, distributed, and experienced.

5.2 Developer platforms: industrial applications and task-based implementations

Developers create industrial metaverses as business solutions focused on specific tasks and measurable efficiency gains. Service providers structure their offerings into distinct operational categories responding to client needs. One describes this taxonomy: *"We divide client needs into 5-6 macro-categories. First is virtual environments – an office, a training room, or something explorable like a museum. Second is digital twins, faithfully reproducing an object in a virtual environment"* (D5). Digital twin applications illustrate how developers prioritize commercial utility. The same practitioner explains commercial use cases: *"Digital twins get requested for purely commercial purposes – reproducing a product catalogue to show people virtually. Imagine a design brand going to a trade show, bringing a headset, and in the headset I see the catalogue, touch objects, dismantle them, rotate them, configure colours"* (D5). Another describes prototyping applications: *"An automotive company needs to prototype components. Until a few years ago, they did it with 3D printing, so wasted plastic material, lost time. You'd pass it to the style office and they'd say 'go back'"* (D1). Virtual prototyping eliminates iterative physical production cycles, generating measurable cost savings.
The pandemic accelerated recognition of these solutions' utility, transforming abstract possibilities into deployed infrastructures. One reflects: *"The pandemic forced those uninterested in these worlds to fully understand how to apply them. From a technological standpoint, it created tremendous awareness"* (D3). This awareness translated into expanded service portfolios across multiple application domains, from virtual showrooms to collaborative design environments. These implementations materialize the task-oriented, time-limited engagement model characteristic of industrial metaverses, creating virtual environments measured by efficiency improvements rather than social inhabitation.

5.3 User communities: social platforms and sustained inhabitation practices

User practices demonstrate persistent commitment to worlding virtual spaces through social and creative engagement operating according to fundamentally different logics. The Italian user landscape reveals sophisticated community structures evolved organically through years of experimentation. VRChat emerges as the dominant platform for Italian social interaction, hosting communities that have developed distinctive Italian spaces within globally accessible virtual environments. Italian users also engage Spatial for temporary event-based activities such as art exhibitions and conferences, Bigscreen for shared viewing experiences, and Meta's Horizon Worlds, though these platforms support episodic engagement rather than the sustained inhabitation characteristic of VRChat communities. Local alternatives such as Xjoy exist but face adoption challenges against established global platforms.

Community formation depends on consistent gathering spaces that transform abstract virtual environments into meaningful places. Regular participants describe how organized events follow predictable rhythms. One community manager describes their schedule: *"We have a games event every single Saturday, except once a month when it's replaced by the music event, where we present four Italian and international DJs and where not only Italians come but Italians and all Europeans*" (U9). The same community organizes biweekly exploration events: *"Every other Friday there's a much more serious event, where we all go together to explore maps created by community users themselves, or we look at avatars created by community users, or particularly interesting public worlds created by others, to see together"* (U9). These structured yet varied event formats illustrate how communities transform platforms into inhabited places through predictable social rhythms and collective practices.

A further consideration concerns place, which complicates the common claim that the metaverse transcends geography. While virtual platforms may appear to exceed locality, what emerges instead is a sense of place understood as cultural rather than strictly spatial proximity. This is evident in the ways Italian users organise their activities around shared language, humour, and habit. Events frequently unfold in settings where Italian serves as the default medium of interaction, and schedules are adjusted to local and European time zones.

Beyond cultural localisation, platform affordances enable specific worlding possibilities that distinguish metaverse sociality from other forms of online interaction. VRChat's portal mechanics allow fluid transitions between virtual spaces, enabling spontaneous group navigation across multiple worlds. Users report extended engagement sessions where temporal awareness dissolves, with participants spending hours in virtual spaces without conscious awareness of time passing. This reconceptualization of presence through virtual inhabitation indicates fundamental shifts in how participants understand social space and co-presence.

Social infrastructure emerges as a critical technical requirement enabling sustained community formation. Participants emphasize the necessity of presence awareness systems, such as friends lists and status indicators that reveal which community members are online and where they are located within the platform. Without such infrastructure, users report difficulty maintaining spontaneous social connections, reducing engagement to pre-scheduled appointments that fail to generate the organic community vitality characteristic of persistent virtual worlds. One interviewee with both professional and community participation experience articulates this principle: *"To create communities in the metaverse you need to provide a recurring, familiar, warm place, with real expectations, welcoming also in the sense that it must resemble something already known, so bars, restaurants, karaoke nights"* (D4).

User worlding practices crystallize into distinct yet overlapping activity modalities. Social entertainment dominates, organized around leisure rather than productivity. One participant articulates this orientation: *"We gather exclusively for fun, gaming, and conversation"* (U10). Creative production represents another major modality, encompassing world-building as both personal expression and economic activity. Platform affordances enable informal pathways from hobbyist creation to monetization. One describes this trajectory: *"It can be a good work opportunity. In fact, with the world I created, I then got equipment for VR through metaverse work; it didn't even take much publicity, just posting some worlds on social media, in groups talking about headsets, and that was enough to get contacts"* (U5). World building frequently maintains ludic motivations, even as it generates economic value. Another user describes an ongoing playful project: *"I'm building a world for fun. Today I'm building the barbershop, because*

I put in the pharmacy and we need the barbershop for the old folks. It's an ironic and comic thing, but there's also a part of the real world there, something colourful for Italy" (U8). These practices demonstrate how creative worlding operates across leisure/labour boundaries, with users fluidly combining expressive, social, and economic logics within the same platform-based activities.

Avatar embodiment emerges as a crucial dimension of user metaverse practices in Italian VR communities. While the importance of avatar-mediated presence was noted in definitional discourse, its full significance becomes evident through observed identity practices. Some users leverage virtual spaces to express identities constrained in physical contexts. One explains: *"Many were already, in the real world, people who were in the furry community or people who have gender dysphoria. I, for example, am theoretically on the non-binary spectrum, so I have an agender avatar"* (U9). Beyond identity expression, VR's proprioceptive affordances enable distinctive forms of embodied exploration. Another describes this embodied experience: *"In VR you move with your avatar. I'm moving my arms, but what I see in front of me isn't my usual body, it's an avatar, something I chose, something I can change whenever I want ... I've always been a very sensitive, playful guy. But in real life, I'm a guy with broad shoulders, 1.80m tall. I started wearing this aesthetic on VRChat because I think it's a manifestation of my inner being. If I had to imagine a person with my character who isn't physically me, I'd imagine them like this"* (U11). Avatar choices reflect not only identity expression, but also platform-specific technical considerations, with users selecting avatars based on animation quality and movement aesthetics regardless of gender identification.

The contrast between developer and user implementations across platforms, communities, and practices illuminates how competing definitional frameworks translate into divergent worlding practices. On the one hand, Developers world industrial metaverses through task-oriented implementations measured by efficiency gains, creating virtual environments for time-limited professional activities structured around specific objectives and return-on-investment metrics. On the other hand, Users world social metaverses through sustained community formation measured by relational density, creating virtual places for open-ended inhabitation structured around leisure, creativity, and identity exploration. These parallel worlding processes produce actually existing metaverses that share technological substrates, while serving fundamentally different purposes organized around incompatible temporalities and success metrics. Developer implementations optimize for brief, instrumental engagements where participants enter to accomplish defined tasks and exit upon completion. User practices optimize for extended, expressive engagements where participants inhabit spaces precisely because objectives remain open-ended and emergent through social interaction.

6. Metaverse operative imaginaries

Although differences and variations exist in definitions and material practices, developers and users broadly converge on a future-oriented technological aspirations for immersive technologies – hardware miniaturization, AI integration, visual improvements, and platform interoperability. Yet this technological consensus masks divergences regarding what these technologies should ultimately enable and for whom. These *operative imaginaries* function as generative forces shaping resource allocation, development priorities, and

community formation, even as they encode fundamentally different visions of value, utility, and legitimate participation.

6.1 Hardware miniaturization and current adoption barriers

Hardware miniaturization emerges as a first shared aspiration across both groups, bridging the B2B/consumer divide documented in previous sections. For example, one developer projects a near-term trajectory: "*Within three years the headsets will become glasses, with prescription lenses inside and you'll see holograms and you'll see people on the street all with glasses moving their hands"* (D3). This vision naturalizes ubiquitous AR through imagined spatial normalization – streets populated by gesture-performing users – positioning wearable computing as inevitable sociotechnical evolution. Users echo this hardware trajectory while articulating divergent assessments of current affordability. One frames miniaturization as aspirational: *"My hope is creating a slim headset that gradually approaches the size and price of a pair of glasses"* (U7). Another contests accessibility narratives: *"Stand-alone headsets now have a quite accessible price, they cost much less than certain phones"* (U11). These formulations reveal internal user disagreement regarding whether economic barriers constitute present constraint or resolved precondition, a tension reflecting heterogeneous purchasing power within user communities.

Both groups recognize miniaturization aspirations through explicit acknowledgment of multidimensional adoption barriers current VR headsets constitute. Developers identify hardware invasiveness as a threshold issue: *"Wearing a smartwatch is identical to wearing a normal watch, wearing a headset instead is something invasive in all effects"* (D5). Another describes temporal limits of embodied tolerance: *"I'm not a fan of headsets ... after a while they bother me, I want to take them off ... Maximum 20 minutes, then I have to take it off"* (D2). Users echo these physiological constraints through experiential accounts. One emphasizes weight and thermal discomfort as deterrents to sustained engagement: *"Many times I just don't feel like getting into VR. Why? Because I don't feel like putting the headset on, because it's heavy. It's starting to get hot now, so it's uncomfortable"* (U11). Developers further diagnose social-cultural barriers beyond hardware. One positions public derision as cultural rather than technical obstacle: *"If I go around with a headset they make fun of me, if I go around with a phone, there was never a temporal moment where phones were derided. That unfortunately is an obstacle that isn't of technology but of culture"* (D4). The glasses imaginary thus addresses sociotechnical configurations where hardware materiality intersects bodily comfort and public acceptability, recognized across both constituencies as prerequisites for mainstream adoption.

6.2 AI integration, interoperability aspirations, and visual fidelity

AI integration represents a second shared priority, though articulated through different registers. Developers frame AI as infrastructural: *"AI will help us generate commands through our voice ... Interactions with the virtual world become simpler, more intuitive, with less effort"* (D1). Another envisions ambient computational layer: *"AI for data analysis of everything you look at, and spatial computing technologies telling you where things are located – these two technologies together can do great things"* (D2). Users articulate AI as an assistive entity: *"An AI assistant could build, for example, a simple avatar, a simple map, or generally just assist you within these virtual spaces"* (U9). The same user extends this: *"I imagine it as a drone that follows you, helps you, you ask it things even while talking with other people and it assists you"* (U9). Where developers imagine AI as distributed infrastructure, users conceptualize it as a discrete agent, a distinction reflecting broader

patterns wherein technical producers emphasize system architecture while users foreground situated assistance.

Cross-platform interoperability emerges as a third shared aspiration, particularly articulated by users. One user describes an expansive vision: *"I imagine the metaverse of the future like the Internet, the network of networks, where we enter, we're ourselves, we have our identity everywhere we go"* (U8). This imaginary positions seamless identity portability and asset mobility across platforms as fundamental to metaverse viability, drawing explicit analogy to internet protocols enabling cross-platform communication. Yet users recognize significant obstacles to realizing this vision. One explains technical incompatibilities: *"This is possible only if platforms all run on the same engine and the same base ... Between one platform and another there are differences in managing materials, shaders"* (U9). Another acknowledges economic barriers: *"For platforms it will never happen ... Those who have competitive advantage will never share it with anyone else"* (U4). This tension between aspiration and constraint reveals how interoperability functions as operative imaginary—shaping desires and expectations – while remaining structurally improbable given competitive dynamics among platform providers.

Visual fidelity improvements constitute a fourth shared priority, though with divergent teleologies. One developer envisions photorealistic convergence: *"The evolution will surely be at quality level, so increasingly we won't distinguish real from digital"* (D1). Users, on the contrary, contest this trajectory: *"The graphics should increase – not too much though – because the real world we already all know about; making super-realistic worlds would also remove that VR effect somewhat"* (U7). This position suggests that users value virtual environments whose appeal lies partly in their aesthetic difference from physical reality rather than in perfect simulation of it. Where developers imagine convergence toward unified mixed reality eliminating virtual/physical boundaries, users express preference for maintaining aesthetic differentiation that signals immersive mode-shift.

6.3 Material constraints and pragmatic compromises

Yet, these shared aspirations confront persistent material constraints that fundamentally limit present implementations. One developer articulates this frustration explicitly: *"All the work we do is limited by technology, it's absurd [...] Everything we do isn't helped, it's limited by technology. We could do incredible things, but unfortunately we can't because we're working with or must interface with a device"* (D2). This acknowledgment reveals how developers' visions of photorealistic convergence and seamless experiences remain constrained by hardware computational limits, forcing continuous compromises between visual fidelity, performance, and accessibility. The tension between imaginaries and material realities gives rise to development practices oriented toward pragmatic optimization rather than ideal implementation, as developers design not for what immersive experiences might become, but for what current devices can realistically sustain.

These patterns illuminate how sociotechnical imaginaries (Jasanoff & Kim, 2015) function as boundary objects, enabling coordination around shared technological trajectories, while also encoding fundamentally different visions of value, utility, and legitimate participation. While developers and users converge on hardware miniaturization, AI integration, and visual improvements as necessary evolutions, they diverge on what these technologies should enable and for whom. Developers' infrastructural orientations reflect professional imperatives that prioritize scalability and market viability, whereas users' agent-oriented framings emphasize experiential immediacy and community persistence. This asymmetry reveals how operative imaginaries both facilitate and constrain possibility: consensus

around technological forms coexists with contestation over social purposes. Rather than representing mere differences in preference, these divergent visions constitute competing imaginaries of the future, actively shaping which metaverse possibilities become materially realized and which remain deferred.

7. Conclusions

This article set out to examine how the metaverse is *worlded* – defined, enacted, and imagined – by developers and users in Italy. Rather than treating the metaverse as a single technological object or a coherent corporate project, our findings show that it materialises as a plurality of *actually existing metaverses*, emerging through situated practices that are shaped by different temporalities, value regimes, and infrastructural dependencies. The Italian case thus illustrates how immersive technologies take form not at the margins of global platform power, but within its uneven extensions, where local actors actively negotiate meanings and uses without escaping structural constraints. Across the study, a recurring distinction came up in both discourse and practice. Developers generally oriented their work toward what they described as an industrial or enterprise metaverse, with task-based environments built for training, simulation, digital twins, and process optimization, and assessed in terms of efficiency, cost reduction, and return on investment. Users, by contrast, enacted a more social metaverse, centred on persistent inhabitation, recurring events, and the ongoing work of maintaining communities across social VR platforms, most notably VRChat, and to a lesser extent Spatial, Bigscreen, and Horizon Worlds. These orientations should not be taken as competing models of a single system, nor as symmetrical positions within a shared ecosystem. Rather, they point to coexisting worlding practices that draw on similar technological substrates, while pursuing different purposes and temporal logics. This asymmetry helps explain why enterprise-oriented implementations rarely appeared in user accounts, and why social metaverse practices were often dismissed by developers as commercially marginal. Industrial metaverses are typically closed, access-restricted, and episodic, intersecting only minimally with the open-ended spaces where users build relationships and cultural routines. Conversely, user-driven social worlds generate value primarily through durational presence and relational density – forms of worth that are difficult to translate into the metrics that govern B2B development. What emerges is not a binary opposition between production and use, but a partial disconnection between domains that are often conflated in abstract discussions of 'the metaverse'.

Despite these divergences, developers and users articulated strikingly similar *operative imaginaries* regarding the future of immersive technologies. Both groups converged on expectations around lighter and less invasive hardware, greater comfort, more intuitive interaction, AI-assisted creation and navigation, and improvements in visual quality. At the same time, they shared frustrations with current limitations, including headset weight, heat, motion sickness, battery life, and uneven accessibility. These convergences indicate that disagreement does not centre on technological trajectories as such, but on what those trajectories are ultimately *for*: scalable professional solutions in one case, and richer forms of sociality, creativity, and embodied presence in the other.

Situated in the Italian context, these findings highlight how local metaverse practices and imaginaries are inseparable from global infrastructures. Rather than overtly resisting dominant metaverse narratives, Italian actors engage with them through selective

reworkings in practice. Developers tend to translate the metaverse into task-bound, time-limited industrial applications – such as digital twins, training environments, and virtual showrooms – whose value is assessed in terms of efficiency gains and return on investment. At the same time, users inhabit a different metaverse, grounded in durational sociality, recurring events, and shared cultural reference points that render platforms such as VRChat meaningful as places rather than products. While remaining deeply dependent on infrastructures controlled by major technology corporations, these practices reshape what the metaverse becomes by aligning it with locally situated rhythms of work, leisure, and community, giving rise to an uneven assemblage shaped by constraint, friction, and partial appropriation through everyday use.

Seen in relation, our findings also caution against reductive formulations that map developers onto industry and users onto sociality as fixed or exhaustive categories. Our fieldwork revealed a plurality of motivations, practices, and meanings within each group, as well as moments of overlap – such as user monetisation through world-building or developers' recognition of community dynamics – even if these intersections remain structurally limited. Rather than a simple ratio between industrial and social logics, the metaverse appears here as a field of partial connections, in which different forms of value coexist without converging into a unified model.

This study has several limitations. Empirically, it focuses on a relatively small sample within a single national context and privileges senior developer perspectives, which limits insight into everyday production practices. Platform coverage reflects the commercial platforms and virtual worlds most prominent within our user sample, rather than the full range of platforms in circulation. Analytically, our developer–user distinction, while heuristically useful, inevitably simplifies more hybrid forms of participation that merit further attention. Future research could extend this approach by comparing multiple peripheral or mid-level innovation contexts, examining, for instance, how different regulatory regimes shape metaverse worlding – an aspect we were only able to address in a limited way given the scope of our empirical material. Longitudinal studies would also help trace how current operative imaginaries evolve as hardware, AI integration, and platform governance change. Finally, closer attention to hybrid actors – such as user-creators, community entrepreneurs, or technical workers embedded in social worlds – could further complicate the boundaries between production and use highlighted here.

By foregrounding situated practices and plural enactments, this article contributes to scholarship that approaches the metaverse not as a singular future to be realised or resisted, but as an uneven sociotechnical formation already being lived, negotiated, and made meaningful in practice. The Italian case demonstrates that understanding what the metaverse is becoming requires attention not only to dominant corporate visions and infrastructures, but also to the everyday worlding practices through which these are appropriated, modified, or unevenly engaged with.

References

Abraham, J., Cruz, G., Cubela, S., Lajous, T., Rowshankish, K., Tiwari, S., & Zemmel, R. (2022, October 9). *Digital twins: The foundation of the enterprise metaverse*. McKinsey & Company.

Alvarez León, L. F., & Rosen, J. (2024). Land, reconfigured: Defying the laws of physics, upholding the rules of the market in the metaverse. *Environment and Planning D: Society and Space*, 42(4), 559-579. https://doi.org/10.1177/02637758241257115

Biernacki, P., & Waldorf, D. (1981). Snowball Sampling: Problems and Techniques of Chain Referral Sampling. *Sociological Methods & Research*, *10*(2), 141-163. https://doi.org/10.1177/004912418101000205

Ball, M. (2022). *The metaverse: And how it will revolutionize everything*. Liveright Publishing Corporation.

Blackman, T., & Harley, D. (2024). Interpreting Apple's visions: Examining the spatiality of the Apple Vision Pro. Platforms & Society, 1. https://doi.org/10.1177/29768624241283913

Boellstorff, T. (2008). *Coming of Age in Second Life: An Anthropologist Explores the Virtually Human*. Princeton University Press.

Boellstorff, T., Nardi, B., Pearce, C. & Taylor, T. (2013). *Ethnography and Virtual Worlds: A Handbook of Method*. Princeton: Princeton University Press.

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Burns, R., Fast, V., Levenda, A., & Miller, B. (2021). Smart cities: Between worlding and provincialising. *Urban Studies*, 58(3), 461-470. https://doi.org/10.1177/0042098020975982

Castronova, E. (2005). *Synthetic Worlds: The Business and Culture of Online Games*. University of Chicago Press.

Chakrabarty, D. (2000). *Provincializing Europe: Postcolonial thought and historical difference*. Princeton University Press.

Gabrys, J., Westerlaken, M., & Fatimah, Y. A. (2024). Actually existing smart forests: A proposal for pluralizing eco-technical worlds. *Environment and Planning F*, 4(2), 210-232. https://doi.org/10.1177/26349825241264393

Girginova, K. (2025). Global visions for a metaverse. International Journal of Cultural Studies, 28(1), 300-306. https://doi.org/10.1177/13678779231224799

Guest, G., Bunce, A., & Johnson, L. (2006). How Many Interviews Are Enough? An Experiment with Data Saturation and Variability. *Field Methods*, 18(1), 59-82.

Egliston, B., & Carter, M. (2020). Oculus imaginaries: The promises and perils of Facebook's virtual reality. *New Media & Society*, 24(1), 70-89.

Egliston, B., & Carter, M. (2024). 'The metaverse and how we'll build it': The political economy of Meta's Reality Labs. *New Media & Society* 26(8), 4336-4360.

Evans, L. (2019). *The Re-emergence of virtual reality*. Routledge.

Harley D (2024) "This would be sweet in VR": On the discursive newness of virtual reality. *New Media & Society* 26(4): 2151-2167.

Haraway, D. J. (1991). *Simians, cyborgs, and women: The reinvention of nature*. Routledge.

Heidegger, M. (1971). *Poetry, language, thought* (A. Hofstadter, Trans.). Harper & Row.

Hesselbein, C., & Bory, P. (2025). *Infrastructures of Reality: Metaverse Stories, Spaces, Bodies*. Springer Nature.

Hesselbein, C., Bory, P., & Canali, S. (2024). Six provocations for metaverse datafication: an emergent cultural, technological, and scholarly phenomenon. *Information, Communication & Society*, 28(5), 778–796.

Hine, C. (2015). *Ethnography for the Internet: embedded, embodied and everyday*. London: Bloomsbury Academic.

IMARC Group. (2024). *Metaverse market report by component, technology, application, industry vertical, and region, 2025–2033*. IMARC Group. https://www.imarcgroup.com/metaverse-market

Jasanoff, S., & Kim, S. H. (Eds.). (2015). *Dreamscapes of modernity: Sociotechnical imaginaries and the fabrication of power*. University of Chicago Press.

Jones, P. (2023). *Geographies of the metaverse*. In T. Osborne & P. Jones (Eds.), A Research Agenda for Digital Geographies (pp. 177–185). Edward Elgar Publishing.

Kobie, N. (2025, May 5). *The dream of the metaverse is dying. Manufacturing is keeping it alive*. WIRED. https://www.wired.com/story/the-metaverse-is-here-and-its-industrial

Lucia, B., Vetter, M. A., & Adubofour, I. K. (2023). Behold the metaverse: Facebook's Meta imaginary and the circulation of elite discourse. *New Media & Society*, 27(2), 790-807.

Lupinacci, L. (2023). *Reclaiming "the experience": Social media, the 'metaverse', and extractive imaginaries of experiential enhancement. AoIR Selected Papers of Internet Research, 2022*. https://doi.org/10.5210/spir.v2022i0.13045

Lynch, C. R., & Muñoz-Viso, À. (2023). Blockchain urbanism: Evolving geographies of libertarian exit and technopolitical failure. *Progress in Human Geography*, 48(1), 66–84.

Kozinets, R. V. (2022). Immersive netnography: a novel method for service experience research in virtual reality, augmented reality and metaverse contexts. *J. Serv. Manag*, 34, 100–125.

Marcus, G. E. (1995). Ethnography in/of the world system: The emergence of multi-sited ethnography. *Annual Review of Anthropology*, 24, 95-117.

Martin, J. V., & Sneegas, G. (2020). Critical worldbuilding: Toward a geographical engagement with imagined worlds. *Literary Geographies, 6*(1), 15-23.

McCann, E., Roy, A., & Ward, K. (2013). Assembling/Worlding Cities. *Urban Geography*, 34(5), 581–589. https://doi.org/10.1080/02723638.2013.793905

McKinsey & Company. (2022, June). *Value creation in the metaverse: The real business of the virtual world* (Report). https://www.mckinsey.com/~/media/mckinsey/business%20functions/marketing%20and%20sales/our%20insights/value%20creation%20in%20the%20metaverse/Value-creation-in-the-metaverse.pdf

Meyer, R. (2025). Operative image spaces: Navigating virtual museum collections. *Swiss Journal of Sociology, 51*(2), 1–17.

Mosco, V. (2023). Into the Metaverse: Technical Challenges, Social Problems, Utopian Visions, and Policy Principles. *Javnost - The Public*, 30(2), 161-173. https://doi.org/10.1080/13183222.2023.2200688

Mosco, V. (2005). *The digital sublime: Myth, power, and cyberspace*. MIT Press.

Murray, J. H. (1997). *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*. Simon and Schuster.

Murray, J. H. (2025). The metaverse and other digital delusions. In B. Beil, G. S. Freyermuth, I. Hamm, & V. Ossa (Eds.), *Gaming the metaverse* (pp. 101–116). transcript Verlag. https://doi.org/10.1515/9783839467339-007

Pinotti, A. (2025). *At the Threshold of the Image: From Narcissus to Virtual Reality*. Zone Books.

PS Market Research. (2023). *Metaverse market: Size, share, forecast, 2023–2030*. PS Market Research. https://www.psmarketresearch.com/market-analysis/metaverse-market

Ramírez, A., Sánchez, J., Reyna, A., Calderón, A., Soto Badui, L., & Sequera, M. (2024). *Rethinking and redesigning a safe and inclusive metaverse: An exploratory study from the Global South*. TEDIC.

Sheppard, E., Leitner, H. & Maringanti, A. (2013). Provincializing global urbanism: A manifesto. *Urban Geography*, 34(7): 893-900.

Smith, H. (2024). The metaverse-industrial complex. *Information, Communication & Society*, 28(5), 797-814. https://doi.org/10.1080/1369118X.2024.2423346

Spivak, G. C. (1988). Can the subaltern speak? In C. Nelson & L. Grossberg (Eds.), *Marxism and the interpretation of culture* (pp. 271–313). University of Illinois Press.

Taylor, C. (2004). *Modern Social Imaginaries*. Duke University Press.

Tolkien, J. R. R. (1983). On fairy-stories. In C. Tolkien (Ed.), *The monsters and the critics and other essays* (pp. 109–161). George Allen & Unwin.

Turkle, S. (1984). *The Second Self: Computers and the Human Spirit*. Simon & Schuster.
Von Stackelberg, P., & McDowell, A. (2015). What in the world? Storyworlds, science fiction, and speculative design. *Journal of Futures Studies*, 20(2), 25-46.

Zuckerberg, M. (2021, October 28). *The metaverse and how we'll build it together – Connect 2021* [Video]. YouTube. https://www.youtube.com/watch?v=Uvufun6xer8

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