

## Materializing Design Fictions for Metaverse Services

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### Abstract

*As the state-of-the-art stands, our knowledge of designing Metaverse platforms is limited. In this paper we propose that design fictions are the first form of prototyping and explore how ‘materializing’ a design fiction can help cement or refute assumptions that drive the development of a software-based system toward a first Minimum Viable Product. Our context is a platform for trading music memorabilia in the Metaverse, integrating content sitting across archives, record labels, publishers, and private collections in an immersive and accessible manner. The design fiction provided both a means of exploring the business assumptions of our industry partner and co-creating an experience of value to its intended audience. As key outcomes, the approach was of value in shaping business assumptions, developing an enhanced understanding of the audience and allowing them to co-create, shaping technology needs and identifying partners necessary for the development.*

**Keywords:** Design fiction, Metaverse, Music Memorabilia, Service Development, UX design.

### 1. Introduction

Developing software-based systems is arguably both an art and science and, in novel situations, the gap between the assumptions re user experience made by a development team and potential user desires and/or needs can be significant. Reducing that ‘gap’ has been a key driver for modern approaches to systems development, which have moved away from a traditional basis of requirements specification (often enforced by contract) to agility, where frequent development iteration and user feedback provide the means of reduction. This approach provides clear advantages in terms of gap reduction, but limitations remain. First, while low and/or high-fidelity prototypes

are often used in early prototyping, to a good degree, they are static in nature and implicitly oriented around traditional 2D interfaces and dynamics involves movement between screens. Second, their fidelity is limited. While it may be the case that these limitations are minor in systems that are 2D and the application context familiar to users in some way, their magnitude is exacerbated in 3D applications that are emerging in the immersive world – i.e., those systems that are exploiting Augmented, Virtual and Mixed Reality with game engines at their heart. Driven by both ongoing innovation in core technology (e.g., virtual production) and the melding of homogeneous technologies (e.g., immersive, AI, Distributed Ledger etc.), the foundations of the Metaverse are here (Ball, 2022).

Working as part of a team on a Metaverse project, we were faced with limitations that led us to ask the research question: *How can we materialize future immersive systems in a manner that allows us to gather feedback on our assumptions re business model and user experience as early as possible in the process?* Though practical in nature, the question is equally motivated by reviews of the nascent Metaverse literature, which notes the need to address (good) user experience, appropriate translation to the real-world, and economic viability (e.g., Gonsler et al., 2023) – principally issues of design. In answering our question, we were led to explore the use of design fictions as the first form of prototyping – materializing one via the production of a high-fidelity video, which embedded the initial business and feature assumptions made by the development team. The application in question was a demonstrator platform for trading music memorabilia in the Metaverse in an accessible and engaging way. In our application, a loyal community of fans will have access to content currently sitting across archives, publishers, record labels, and private collections.

In describing and evaluating the outcomes of our research, the paper is structured as follows. Section 2 sets out the context of the problem and reviews the

extant literature on the use of design fictions as a methodological tool. Section 3 provides detail on the methodological approach used to collect, analyze, and evaluate our case data alongside detail on the (commercial) case that was used as the vehicle – a Metaverse-based music memorabilia application. Section 4 presents the results of our analysis, providing concrete evidence of the value and insights gained from the empirical exercise. Section 5 provides discussion on our outcomes in relation to our objectives, reflecting on the implications for both theory and practice. The work reinforces that materializing design fictions in an engaging manner for users is a valuable means of market-checking assumptions in manner that limits both cost and effort in the initial stages of development. The approach is of value in situations where systems and/or their applications are novel.

## 2. Design Fictions as a Methodological Tool

Across the last 10 years or so, there has been a rise in approaches that research *through* design. Broadly characterized under the umbrella of a ‘landscape,’ these approaches include critical design, speculative design, worldbuilding and design fiction (Dunne & Raby, 2013; Lindley & Green, 2021). In essence, all are provocations intended to raise questions and shape exploration/innovation about a possible future world (Bleecker, 2022). Despite difference in name, in thinking about that world, all forms aspire to consider social, cultural, and ethical implications (Galloway & Caudwell, 2018), most use prototyping as a key means of realization (Auger, 2013) and the design process is increasingly participative – e.g., employing co-design (Farias et al., 2022). Here we focus on design fiction (DF) which, if a difference is to be noted, is more pragmatic and makes fewer claims to sparking critical debate (Galloway & Caudwell, 2018). There are key elements in common, however (Coulton & Lindley, 2017; Markussen & Knutz, 2013). First, the ‘ends’ of the activity is the creation of a fictional world. Second, the ‘means’ of that fictional world need to be realized and materialized – rehearsing the future to prepare us for its arrival.

The speculative root of design fictions is not new – creatives have long used (science) fictions, ideals, and utopias to experiment and/or toy with possible futures (Markussen & Knutz, 2013). Over time, the literature on design fictions has expanded and moved beyond theorizing on the fiction concept into their use in contexts such as healthcare, education, and sustainability (Ahmadpour et al., 2019; Cox, 2021; Liu et al., 2021; Wakkary et al., 2013). Given the more pragmatic focus, there has also been a rise in the use of DF within the Human-Computer Interaction (HCI)

community (Cheon et al., 2019; Lindley & Coulton, 2016).

In broad terms, our review of the literature has led us to categorize contributions in line with the creation, realization, and materialization perspective as follows:

- Research on the concept of design fiction and world building. Here, work focuses on the theoretical nature of design fiction, developing the concept and providing a lens to explore and criticize plausible futures (Bleecker, 2022; Blythe, Mark & Encinas, 2016).
- Research on realizing design fictions. Here, the focus is on becoming aware of and/or understanding how to harness design fiction effectively. In this sphere, work typically concentrates on formalizing design fiction methodologically to; (a) normalize it; (b) consider it as a manageable/repeatable process; and (c), to (more robustly) test concepts, assumptions and/or outcomes (Alvarez de la Vega et al., 2022; Chi et al., 2022).
- Research on materializing design fictions. Here, the focus is on making the design fiction physically real to people, such that the world(s) built can be harnessed to probe users, test concepts etc., for example in the form of prototypes (Economidou et al., 2021; Gilardi et al., 2016).

Despite increasing popularity, design fiction is not immune to criticism on several counts. First, and as may be expected from increased interest, there are calls for more formal accounts “of, for instance, various techniques for prototyping possible futures, the role of utopias and dystopias in design research experiments and the types of knowledge that may result from practicing design fiction” (Markussen & Knutz, 2013 p. 232). This is unsurprising, as it is clear the literature on design fiction is still young and that there are many ways to address both their ‘means’ (the objects and artefacts produced in realizing and materializing) and ‘ends’ (the world(s) built). In realization terms, examples include ethnographic interviews, workshops, or focus groups (Markussen & Knutz, 2013; Wong, 2021). In materialization terms, forms include narratives, events, models, images, audio, and videos through to functional prototypes (Blythe, M., 2017; Dunne & Raby, 2013).

Second, Coulton and Lindley (2017) note that discussing the ‘fuzzy’ concept of the future is difficult. A common means of dealing with this difficulty is to invoke the qualifiers in Voros’s Futures cone as follows:

- Possible. A future that is permitted by the physical laws of the Universe, no matter how unlikely that may be.

- **Plausible.** A future that is not necessarily too difficult to imagine but that is difficult to predict.
- **Probable.** A future that is likely to happen but that is not completely certain.
- **Preferable;** a future that we would like to happen.

This last qualifier can be seen as an overlay to the previous three – e.g., a future may be both plausible and preferable – but indicates one future that is singular and desirable. In that sense, it is a contentious qualifier that has been argued to promote elitist conceptions of a ‘better world’ (Bowen, 2010). Thus, while designers might consider whether a particular possible world is preferable, it should not be the endgame (Coulton et al., 2016) and the role of design fiction should be to create space for discussion rather than dictate how things should be – i.e., this *could* happen rather than this *will* happen (Dunne & Raby, 2013).

Third, design fictions are inevitably rooted in historical interpretation – in creating design fictions we cannot entirely free ourselves of our lived experience, cultural contexts etc. As Coulton & Lindley (2017) note, world building “with awareness of the past brings with it ‘mess’; product lifecycles interoperability issues, elderly users, malfunctions, data breaches.” In this sense, Bleeker (2022) also highlights the inevitable intertwining of fact and fiction – providing concrete examples that illustrate where they both swap properties and drive the other in turn.

Fourth, though modern technology enables us to make working prototypes that are more practical and hands-on (Blythe, Mark & Encinas, 2016), challenges have been raised for design fiction in relation to: (a) *Narrative*, in terms of how storytelling affects reader audiences on both a social, cultural, and political level, as well as a personal one (human conflicts, values, and emotions); (b) *Ethics*, particularly in relation to privacy and data sharing (Luu et al., 2018); (c) *Practices*, in terms of potential communication gaps between designers, other stakeholders and the end-user group involved in the design process (Malizia et al., 2018); and (d) *Evaluation*, in terms of improving standards relating to rigor and transparency (Harwood et al., 2020).

Building on that last point, and with the HCI community in mind, design fiction should not direct itself to evaluating user interactions per se but, rather, consider a world in which that interaction makes sense to the prospective user (Sturdee et al., 2016). In this respect, many researchers agree that gathering a wide range of user feedback is essential in speculating the future (Ahmadpour et al., 2019; Hanna & Ashby, 2016). Most importantly, however, the ‘manifestation’ of a design fiction must capture people's imagination for that future to become a reality.

### 3. Context and Method of Study

#### 3.1 Context

Though we are limited by commercial confidentiality in what we can say about the context (referred to as *MetX* hereafter), its goal is to provide users with a photo-realistic 3D immersive environment that unifies and exploits content sitting across archives, record labels, publishers, and private collections in an accessible and engaging manner for a loyal community of fans. From a user perspective, *MetX* allows users to engage with music memorabilia in a more personalized and immersive manner – providing new means to share what they own, engaging with like-minded fans via experiences beyond traditional concerts/artist performances, and exploiting emerging trends in collectibles. The goal behind the work here was to produce an initial Minimum Viable Prototype (MVP), functional enough to be used as a vehicle to secure venture funding for the full platform development.

The project team consisted of *Firm A*, the commercial driver behind the platform; *Firm B*, an established immersive content developer; and us as a research partner, with responsibility for user experience research and business modelling. We comprised the three people named on this paper, two of whom have experience of customer experience design (and using Lean UX as part of that), where one of those two also has commercial development experience.

#### 3.2 Methodological Approach

Conceptually, we employed *Design Science Research* (DSR) (see Engel et al., 2019; Hevner et al., 2004) as our methodological framework as it partners critical/theoretical reflection with a practical approach to delivering value via its: (a) Iterative and/or incremental nature (promoting continuous learning between problem & solutions); (b) focus on utility (ensuring that outcomes are of practical benefit); (c) ability to both integrate theory/justificatory knowledge from reference disciplines and generate new theory via the design process; and (d) focus on improving a knowledge base via reflection on practice and generation of innovation (Jones & Gregor, 2007).

Importantly, the mindset of DSR translates well to the practical (agile) development approaches employed by our partners – providing a common framework for the development effort. In moving through realization to materialization, we used the tools and techniques of Lean UX (Seiden & Gothelf, 2013) to flesh out the business assumptions, feature hypotheses, and personas

etc. that formed the basis for materialization of the design fiction.

### 3.3 From Concept to Materialization

Our first task at hand was to develop an early form of design fiction in narrative form. The outcome from initial design meetings and refinement was thus:

*Imagine entering a photo-realistic immersive digital environment, being greeted by a digital version of your favorite music artist, who interacts with you and guides you (and your friends) through their content in an immersive and personalized way – where you are educated as to the history, context, and personal meaning. Imagine being able to interact with highly realistic 3D representations of memorabilia and collectibles, being able to bid for/purchase or license them whilst being assured of their provenance.*

With discussion, this was enough for the team to coalesce around a shared understanding. Following the Lean UX approach we then worked with our industry partners to: (a) Surface their key business assumptions, user assumptions and the feature hypotheses that followed from those; (b) develop a conceptual framework for the platform, which set out the metaphorical basis on which the framework would rest alongside the key asset classes and actors involved; and (c) clarify the key stakeholders, who effectively form the platform sides, alongside the nature of their roles. These actions provided us with a depth of understanding suitable for materialization. The key question then faced related to the form that the initial MVP should take. Given that we were looking to develop an immersive environment, 2D prototype forms (e.g., wireframes) were not considered rich enough, but fully formed immersive environments were too expensive to materialize without investment funding. Looking at the forms employed/discussed in literature, there was consensus that a video-based MVP would likely provide the balance that was required – importantly, attending to the point made earlier that the ‘manifestation’ of a design fiction must capture people’s imagination for that future to become a reality.

To facilitate that, the team developed a video script that was reflective of the work done as part of the design thinking noted above. This script went through two rounds of iteration with the industry partner, prior to its materialization by them using the Unreal game engine (animation models), Ready Player Me (character models), and Adobe Premier Pro (editing). The

materialization itself passed two rounds of iterative refinement in getting to the point where we were ready to test the world built with potential stakeholders. [NB: *Video will be shown at conference*].

### 3.3 Empirical Testing

Visitors (fans, tourists, collectors), Tenants (artists, record companies, curators etc.), and Affiliates (advertisers, service providers, etc.) represent the three key stakeholders of importance (and the potential sides of the platform). Our focus here is on Visitors and the objectives of empirical testing of the design fiction were to: (1) Validate (or otherwise) the business assumptions and feature hypotheses developed; (2) develop personas for Visitor types; and (3) to assess whether the concept did in fact capture people’s imagination.

Potential visitors were drawn from a large panel of people (1,500+) who have both an interest in and experience with immersive technologies, which has been developed over time in connection with a much larger immersive project. A call was put out on that panel and 22 people were selected for interview – selection was made to ensure a gender split being 50:50 and a reasonable age range of between 20-50 years. In parallel, an interview guide was developed to ensure interviews related to objectives – enabling consistency across interviews while preserving for emergent aspects. Ethical clearance was obtained prior to the empirical analysis (via standard University process). Interviews were conducted online and lasted between 60 and 90 minutes. Following standard practice, the data was anonymized to protect participants and recordings, transcriptions and analysis stored on different drives.

Thematic Analysis (TA) was used to identify, analyze, and report patterns (themes) within the interview data (Braun & Clarke, 2006; Nowell et al., 2017) with NVivo used to support (Castleberry & Nolen, 2018). TA is appropriate where there is a need to comprehend experiences, ideas, or behaviors (Kiger & Varpio, 2020) and/or to examine the open-ended nature of the data, identify problems and solutions, similarities, or contrasts, and subsequently ensure confident data to influence future products and services (Alvarez de la Vega et al., 2022; Lackovic et al., 2015). Though it is the case that TA has been criticized for a lack of engagement with the theoretical and philosophical assumptions that underlie methods (Braun & Clarke, 2021), more recent approaches have sought to address this by developing a more reflexive TA based on a codebook, incorporating aspects of Grounded Theory, providing additional guidance on sample sizes and the population of themes, and addressing philosophical assumptions (Braun & Clarke, 2019; Chapman et al., 2015; Fugard & Potts, 2015).

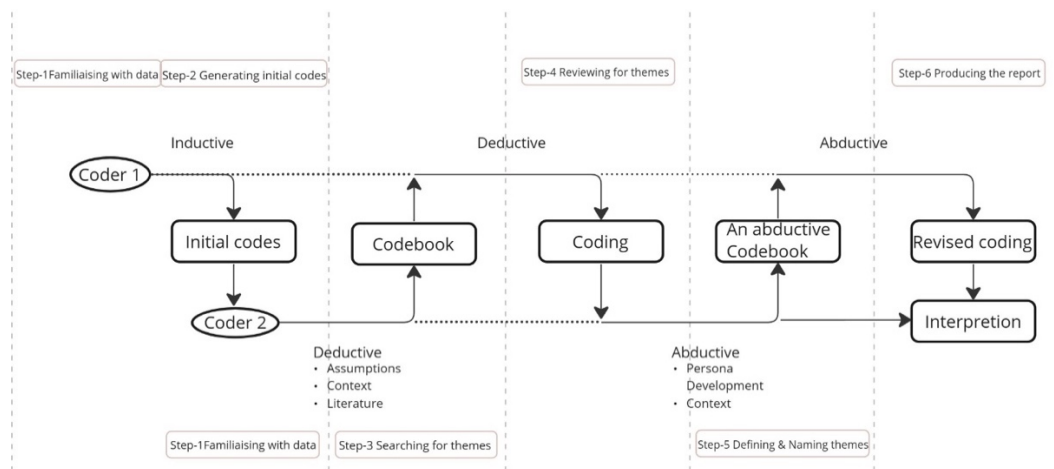


Figure 1. Coding Process (see Castleberry & Nolen, 2018).

As noted, the entire coding process was guided by a reflexive framework employed for coding, which accounts for the noted issue with TA (Nowell et al., 2017). This framework is illustrated in Figure 1 and provides the transparency necessary to help ensure confidence in the findings (Castleberry & Nolen, 2018).

Following an inductive (data-driven) strategy, Coder 1 produced an initial set of codes. Coder 2 employed a deductive strategy (concept driven) based on the business hypotheses established earlier and the persona framework employed for this research. Both code sets were mapped into an initial codebook that Coder 1 used to recode all transcripts, with Coder 2 assisting. Following Graneheim et al. (2017), this procedure implied a back-and-forth between inductive and deductive coding, resulting in adjustments to the codebook. For example, during the inductive coding, several feature suggestions and even requests from participants emerged that were not captured by the deductive (persona-based) coding process. These codes emerged inductively and were coded by both coders independently during the process of updating the codebook. Any disagreement between coders was arbitrated by the remaining party named on this paper (though there was little in practice).

#### 4. Presentation of Results

As noted earlier, the objectives of the empirical work were to: (1) Validate (or otherwise) the business assumptions and feature hypotheses developed; (2) develop personas for Visitor types; and (3) to assess whether the concept did in fact capture people's imagination. In the following, we present preliminary results for each.

#### 4.1 Coding Outcomes

Results from 22 interviews with Visitors were organized into seven main code categories, five of which driven from the persona literature (Boag, 2021): Tasks (activities), goals, feelings, influences, and pain-points. One additional code emerged from discussions with participants around the business, with the final code capturing feature suggestions and/or feature requests from respondents. Except for discussions related to the business, codes were further separated into sub-codes drawn from the literature (e.g., people, things, places, etc.), and some specific to a code (e.g., 'collection & memorabilia' relating to 'goals'). Sub-codes enriched our understanding of personas but, importantly, also allowed us to quickly draw out key similarities and differences between personas and their needs/wants.

#### 4.2 Business Assumptions and Feature Hypotheses

The most interesting outcome re business assumptions was that there was little in the way of validation – primarily because assumptions were tilted toward the Tenant stakeholder group. This pointed to a key disconnect between the business and user assumptions that was not beneficial moving forward. Though a platform needs to be populated with Tenants, a sophisticated enough understanding of visitors is required to provide those Tenants with the key 'building blocks' that allow them to provide a good visitor experience with a minimum of effort.

From a feature hypotheses perspective, the following aspects were apparent:

- Clear interest was expressed in viewing and interacting with objects in a way not possible in the physical world. Almost all visitors expressed a desire to inform themselves about objects in a way that goes beyond a typical entry on a Web page. For example, visitors would value video content in which an object was used, perhaps even content that isn't easily accessible (e.g., a studio session showing an artist using an instrument or writing down lyrics).
- Several visitors expressed an interest in engaging and/or interacting with like-minded individuals directly on the platform. While interactions with others were generally valued, however, this should not be an extension of current social media platforms. Instead, visitors expressed a desire for a playful and safe environment where interactions take place around shared interests (such as objects, music styles, etc.). Several visitors mentioned negative experiences on social media platforms and highlighted 'safety' as an essential prerequisite for them to feel comfortable interacting with others on the platform.
- In addition, some visitors indicated an interest in keeping a record of their experience (e.g., a badge, photo, etc.) and/or to share that record with others outside the experience (e.g., sending a photo to friends on social media).

Preferences for the visual style of a Visitors avatar, the avatar of other visitors, and digital humans (embodied representations of artists etc. that act autonomous and/or are programmed) were somewhat plural. While a general preference appears to be a slightly stylized version of the overall experience (depiction of self and other humans), some visitors stated a preference for 'Anime/Manga' style depictions and/or the ability to change the overall graphical style during the experience – this was indicative of the need for personalization on both this and other fronts. Visitors were, however, quite clear on what they did not want, which is a depiction of characters that aims for photo-realism.

### 4.3 Persona Development

A persona is a representation of a party (typically a user or customer) that elucidates their goals, needs, interests and the like (Cooper, 2004): They have become of increasing value as they allow market/business strategists to connect with their (potential) customers more effectively – bringing

market segments 'to life' (Arnould & Cayla, 2015) and/or putting a "face and a name on disconnected bits of data" (Arnould and Cayla 2015 p.1371).

Drawing on the coding exercise, we were able to draw out three distinct personas from the interview data, as summarized in Table 1. Please note that, due to space restrictions, the full detail, and links to sub-codes have been omitted – given this, within each category (e.g., goals, feelings) we have shown examples related to different sub-codes.

### 4.4 Thoughts on the Platform Concept

As noted earlier, there is a need to assess whether the platform concept did capture people's imagination. Broadly speaking, the answer to that question is yes, but not quite in the way we expected. Our hope was that, in stimulating Visitors, the materialization of the design fiction would draw out whether the concept 'had legs,' as such, and enable us to draw out the features that would be most valuable to Visitors. Figure 1 provides evidence of this latter aspect, but the quotes below illustrate that, aside from comments on the overall concept, themes emerged that were not necessarily part of our original thinking.

*"A lot of instruments do not exist anymore, singers have died long ago, sets don't exist [...]. I think the idea of [. . .] what you've what you've talked about in the video, like bringing to digital life [...] that physically don't exist at all anymore, that could be really interesting."* [Interviewee 1 on the concept]

*"Yeah, because [...] if your friends are visiting, if all your friends are in this space and everyone has their own room [...] but your room is the only one with like these certain panel on the wall. I think that's what gives people like reason to like come [and] see them"* [Interviewee 3 on social]

*"The first thing that came to mind for me was sustainability because [...] with transporting items and then also the creation of these items, you wouldn't necessarily need to make a physical piece, but people can have the ability to own something that's memorable that doesn't have to be like affecting the environment."* [Interviewee 4 on sustainability]

<b>Persona</b>	<b>Superfan Alice</b>	<b>Musical Bob</b>	<b>Virtual Carol</b>
Tasks <i>(to complete)</i>	Expanding & exhibiting collection(s) Engaging with community	Experiencing & and learning about music Engaging with artists	Discovering new experiences Applying them to work/life
Feelings <i>(priorities about experience)</i>	Easy to navigate Curation is critical Customizable avatar Access to the “history” of items Ability to use virtual items	Easy & customizable navigation Content curation critical Importance of storytelling First-person perspective Customizable avatar Flexible representation of artist (digital human presenting artists at different epochs)	Easy to navigate Ability to locate (search for) interesting objects/rooms/people Customizable avatar Access to surprising information not easily available elsewhere Realism of 3D objects is important Ability to attend live performances
Influences <i>(people, things, places)</i>	Community (artists, other superfans) Concerts (organizer & venues) Collection (personal meaning, pre-orders, sales events for memorabilia)	Community (people with shared interests; safety, security, and anonymity of environment; rehearsal space) Audio quality Experience (narrative, atmosphere, new content, interactivity) Objects (interactive functionality, storytelling around objects, incl. if and how an instrument can be played)	Community (safety, security, and anonymity of environment; unique avatars / character design) Experience (narrative, atmosphere, new/updated content, incl. temporary exhibitions) Objects (interactive functionality, storytelling around objects, incl. if and how an instrument can be played)
Pain points <i>(what they are trying to overcome)</i>	Collecting becomes increasingly time-consuming (difficult to trace remaining items) Exhibiting collection Speed to secure/buy items Inaccurate/ missing information Competition with other superfans	3D objects are not accurate and/or lack functionality Audio quality of VR experiences VR experiences lack authenticity	Current VR experiences are not particularly immersive and/or lack understanding of human behavior (technology-driven, not user-driven) 3D objects are not accurate and/or lack functionality VR experiences lack a convincing/engaging narrative Social interactions either limited or t
Overall goals <i>(what they are trying to achieve)</i>	Expand and share collection Create personal space Safe interactions with others	Interact with and/or learn from music experts/artists Access to accurate information Multi-sensory experiences	Experience cutting-edge and/or experimental VR that is story-driven (beyond the current norm) Experimentation with NFTs in immersive environments (e.g., attendance tokens etc.) Facilitate positive social interactions

**Table 1. Persona Summary (Examples).**

## 5. Discussion

### 5.1 Observations and Practical Implications

In overall terms, we would judge our endeavor to be successful, in that we have been able to employ design fiction practically and take it through the cycle of creation, realization and materialization. The purpose of that exercise was to gain insight by: (1) Validating (or otherwise) the business assumptions and feature hypotheses developed; (2) developing personas for Visitor types; and (3), assessing whether the concept did in fact capture people’s imagination. In creating our fictional music memorabilia world, the materialization of the design fiction was quite revealing. Most prevalent was the skew of the business

model toward Tenants, highlighting lost opportunity re customer value and relationships. Though the deductive aspect of the coding provided a coherent framework within which to work, it was the inductive aspect that was enlightening re this skew with visitors providing many nuances here (represented in sub-codes) – e.g., in relation to the presentation of self (appearance, anonymity, personalization, etc.), usability (navigation, UI/UX-related elements, etc.), and storytelling (including the overall narrative on which the experience is based). Further, aspects of potential value were noted by Visitors that formed emergent codes. Examples of this are things (assets, items, objects), people (community and other audiences), and places (incl. environment/context).

The result of this insight has been a significant rethink of the business model, such that the original

view of value lying predominantly on the Tenant side is now abandoned in favor of a balance between Tenant and Visitor, and further thought given to third-party services by Affiliates. Overall, however, the outcomes demonstrate that materializing design fictions in an engaging manner for users is a valuable means of market-checking assumptions – limiting costs and efforts in the initial stages of development.

## 5.2 Implications for Theory

In reflecting on how our approach is useful for practicing DF (and the speculative landscape more generally), we demonstrate the benefit of DF where systems and/or their applications are novel (Bleecker, 2022; Coulton & Lindley, 2017; Lindley & Coulton, 2015). Moreover, it helps to move a future from plausible to probable and, arguably, the co-created aspect comes from communication and interaction with the intended audience acting as a guard against that future being preferable and/or elitist (Bowen, 2010; Coulton et al., 2016).

As noted earlier, realization is sketchy in the literature – leading to the call for more formal accounts (Markussen & Knutz, 2013). Our learning here is that realization is the design process, the explicit linking of concept to materialization. Practically, our means of realizing this was to employ the techniques of Lean UX (Seiden & Gothelf, 2013) in doing that. There are, of course, many other techniques for design, and appropriateness will depend on context. There is a squaring of the circle with the Design Science literature here, however, and our learning is that design theory provides an important means by which design knowledge is captured, formalized, and communicated. Consequently, plurality of techniques is not necessarily a priority. Instead, the issue of importance is that key design decisions need to be made transparent, and the mapping between different models made clear (Lycett & Radwan, 2019).

## 5.3 Limitations

As with most work (especially at an early stage), there are limitations to acknowledge. First, there are aspects related to the ‘theory’ of design fiction that we are yet to explore in detail – poetics for example – that will likely improve our ability to adopt a critical design lens. Second, and related, further critical insight would likely help us to further refine our observations in relation to how to improve quality and transparency in the realization part of the process (in particular). Effort here would further help address the criticism that realizations are context specific (Lindley & Green, 2021). As we have noted, this is the area where

evaluation is most tricky. Third, though we have framed our research in terms of Design Science, we are yet to do the work to consider and evaluate the outcomes from that perspective. Last, as our analysis is preliminary, there is no doubt that the detail related to our outcomes can be improved, leading to better practical insight and further iteration in relation to the development of the platform.

## 6. Summary and Conclusion

As the state-of-the-art stands, our knowledge of designing Metaverse platforms is limited, and the development of such systems is both expensive and fraught in practice. In that context, our aim was to examine how to materialize future immersive systems in a manner that allowed us to gather feedback on our assumptions re user experience and business model as early as possible in the process. We employed the design fiction concept to do that –emphasizing the three key phases of creation, realization, and materialization. First, we worked with our partners to create a vision for an immersive platform oriented at music memorabilia. Second, we realized that vision by employing the techniques associated with Lean UX to shape the design of the platform. Last, in dealing with the issues of bringing an immersive concept to life without the funding for full development, we materialized the concept via a video that was used to: (1) Validate (or otherwise) the business assumptions and feature hypotheses developed; (2) develop personas for Visitor types; and (3) to assess whether the concept did in fact capture people’s imagination.

Overall, we were successful in our endeavor. The DF concept and its materialization via a video allowed participants to immerse themselves intellectually and emotionally in a hypothetical experience. Specifically, it made it possible to clarify their understanding of the service during interviews, as well as to ‘trigger their imagination,’ that is, for them to suggest potential use cases and/or concrete functionalities. We acknowledge limitations related to the need to: (a) Improve our critical design stance; (b) refine our observations in relation to how to improve quality of the realization; (c) address our outcomes from the Design Science perspective; and (d) move beyond the preliminary findings to further develop the platform.

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