Evaluating Design Fiction for Requirements Elicitation in a Digital Game: An Exploratory Experimental Study

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Abstract. Context: *Developing digital games is complex, requiring more than technical skills—it also involves capturing emotional and creative elements. This makes Requirements Engineering (RE) for games especially challenging, as traditional techniques often fail to address these aspects, causing gaps between developers and players.* ***Objective:*** *We explore Design Fiction as an alternative approach to support professionals in the game requirements elicitation process. Design Fiction combines design, science, and fiction to examine possible scenarios through narrative artifacts and diegetic settings.* ***Methodology:*** *An exploratory study employed Design Fiction and the Technology Acceptance Model (TAM) - based questionnaires to assess professionals' perceptions of a technique in early Survival Horror game design.* ***Results:*** *Results indicated high acceptance and engagement. Design Fiction proved effective in fostering creativity, clarifying expectations, and supporting collaboration, making it a valuable approach for eliciting experiential and emotional requirements in game RE.*

Keywords *Digital Game, Design Fiction, Requirements Elicitation, Requirements Engineering, Technology Acceptance Model*

1. Introduction

The development of digital games has solidified itself as a multidisciplinary field that integrates technical and creative aspects, where professionals, including software developers, designers, and writers, collaborate to create interactive experiences, engaging narratives, and complex game systems. In this context, unlike traditional software development, the Requirements Engineering (RE) process in digital games demands a unique approach, one that considers not only functional and technical requirements but also encompasses subjective elements such as

narrative, aesthetics, game mechanics, interactivity, and the emotional engagement of players [Hussain et al. 2018]. These factors make traditional requirements elicitation methods — focused on the functionality and behavior of the system — insufficient and ineffective for dealing with the ambiguity and interpretative openness inherent in game design, as well as with forms of representation and analysis that integrate both the functional logic and the experiential expectations of the target audience [Murphy-Hill et al. 2014, Pichlmair e Johansen 2021].

It is common to use artifacts such as the Game Design Document (GDD), which brings together the main guidelines and decisions of the project to organize and align the development team's vision [Conway 2021]. Development teams employ several methods for requirements elicitation, including brainstorming, market research, benchmarking, storyboards, interactive prototypes, and testing preliminary versions [Callele et al. 2005]. However, such approaches often fail to adequately capture the complexity of subjective experiences, the emotional impact intended for different player profiles, or the possible emergent uses that characterize digital games [Hussain et al. 2018]. This limitation highlights the need for alternative and innovative strategies, particularly those that prioritize exploring intangible and speculative aspects [Coulton et al. 2016a].

In this context, Design Fiction emerges as a promising approach to support professionals in the RE process for digital games. Originally formulated as a practice that combines design, science, and fiction to explore possible (future or past) scenarios through narrative artifacts and diegetic settings [Bleecker 2022]. Design Fiction has increasingly been used to provoke critical reflection on non-existent or alternative realities [Baumer et al. 2020, Muller e Erickson 2018]. Its application to requirements elicitation — especially under the perspective of Speculative Requirements Design [Darby et al. 2018] — allows for anticipating needs, values, and usage practices by constructing plausible narrative worlds in which requirements emerge from contextualized interactions with fictional artifacts. However, its use has been growing in areas such as Human-Computer Interaction [Tanenbaum 2014, Lindley 2015], Augmented Reality [McVeigh-Schultz et al. 2018], and Conversational Systems [Wessel et al. 2022, Penney et al. 2023]. The application of Design Fiction in the digital games domain is still in its early stages, especially in directly supporting RE [Coulton et al. 2016a]. Due to their speculative, playful, and fictional nature, digital games represent a fertile field for applying this approach, as they share the same imaginative territory where possible worlds are created, explored, and experienced.

Therefore, this work investigates how Design Fiction can support the RE process, in the context of requirements elicitation for digital games. The research question we answer is defined as follows.

Research Question

How do professionals perceive Design Fiction in eliciting the requirements of digital games?

To address this, we conducted an exploratory experimental study involving seven professionals with experience in software development. The participants took part in a structured Design Fiction session designed to elicit requirements for a digital game in the Survival Horror genre, which was currently in the conceptual phase. The activity involved creating and analyzing speculative scenarios that explored potential interactions, experiences, and expectations related to the game in development. To assess the method's acceptance among developers, we employed the TAM [Venkatesh e Davis 2000]. Additionally, we included an open-ended question to allow participants to express their perceptions, ease, and difficulties with using Design Fiction in the context of RE for digital games.

2. Design Fiction

Design Fiction is a methodological approach that combines design, science, and fiction to imagine and explore worlds through the creation of fictional scenarios [Bleecker 2022]. Design Fiction proposes the construction of worlds or alternative universes, which can be utopian, dystopian, or ambiguous, as a strategy to stimulate critical reflection on emerging innovations, their implications, and potential uses [Bleecker 2022, Baumer et al. 2020].

One of the central points of Design Fiction lies in its ability to suspend the limits imposed by immediate technical and technological constraints, allowing designers, developers, and other stakeholders to design and discuss non-existent systems based on plausible experiences in fictional worlds [Coulton et al. 2016b]. Through so-called diegetic prototyping, a concept formulated by Bleecker (2022), fictional artifacts are inserted into coherent narratives, facilitating the materialization of ideas and the generation of both functional and non-functional requirements based on contextualized uses. The application of Design Fiction typically follows a structured flow composed of well-defined stages, as described below [Candello et al. 2019, Bleecker 2022, Wessel et al. 2022].

(i) **Context and Problem:** A domain of interest is selected—for example, the conception of futuristic cities or emerging medical technologies—and the challenges or opportunities that may lead to new possibilities are identified. A time horizon (short, medium, or long term) is also defined, influencing the nature and depth of the speculation.

(ii) **Research and Insight Gathering:** An analysis of technological and social trends and consultation of science fiction works, art, philosophy, and specialized literature is conducted. This stage enriches the creative foundation and anticipates future implications or revisits past scenarios with new interpretations.

(iii) **Generation of Speculative Scenarios:** Plausible narrative universes are developed, which may encompass desirable, viable, or dystopian futures or pasts. These scenarios provide a backdrop for giving meaning to the designed artifacts and experiences.

(iv) **Creation of Fictional Artifacts:** Various elements are created, such as objects, interfaces, documents, or products typical of the imagined universe, like user manuals, advertisements, newspapers, or visual prototypes, making the scenario more tangible and immersive.

(v) **Narrative Development:** A story is constructed around the artifacts through scripts, dialogues, or short videos to contextualize their presence in the daily life of the speculative universe and foster participants' immersion in the experience.

(vi) **Experimentation:** The narrative and artifacts are presented to a target audience (users, developers, experts) to observe reactions, interpretations, questions, and insights about the proposed system's implications.

(vii) **Discussion and Analysis of Results:** The feedback collected during experimentation is gathered and analyzed to refine emerging requirements, identify values, expectations, and concerns, and enrich the system design process.

In summary, Design Fiction has proven to be an effective approach for exploring possible worlds and eliciting requirements in contexts where creativity, subjectivity, and fiction play a significant role, such as in game development.

3. Related Work

Design Fiction has been explored in several fields to anticipate future and past scenarios and foster critical discussions about emerging technologies. Wong *et al.* (2017) employed Design Fiction to investigate tracking and monitoring technologies, drawing inspiration from the science fiction novel The Circle in 2013 [Eggers 2013]. The study began by creating proposals that connected fiction to reality, generating speculative narratives that reflected on the use of such technologies in everyday life. The methodology consisted of creating fictional

artifacts and conducting discussion sessions with participants, focusing on the social, legal, and technical aspects of these technologies, particularly in relation to privacy and surveillance. The results highlighted the potential of Design Fiction as an engagement tool, promoting critical reflection on the impact of monitoring technologies in contemporary society.

Ahmadpour *et al.* (2019) explored Design Fiction as a co-creation methodology for developing technologies in elderly care. This study aimed to investigate the dialogue between developers and end-users (in this case, elderly individuals) to inform the design of a health monitoring device. The research involved collaborative sessions with participants, in which speculative scenarios served as a basis for discussing values, preferences, and concerns. The results indicated that the approach helped translate abstract concepts into meaningful experiences, enabling a closer alignment between product design and the actual needs of the target audience.

Candello *et al.* (2019) employed Design Fiction to explore the application of robots equipped with artificial intelligence as museum assistants. The study focused on understanding museum guides' perceptions, expectations, and concerns regarding the introduction of these technologies into their work environments. The authors invited the participants to collaborate on designing fictional narratives that addressed coexistence with robots. Through these narratives, guides expressed their concerns, critiques, and aspirations, revealing the ethical and social implications of adopting the technology. The authors concluded that Design Fiction was effective in stimulating critical and creative thinking, as well as promoting reflection on institutional values and the impact of emerging technologies on human relationships.

Lycett *et al.* (2024) explored the use of Design Fiction as a prototyping strategy to support the development of immersive Metaverse services. This work focused on materializing a fictional scenario through a high-fidelity video, aiming to validate business assumptions, understand user expectations, and shape the design of a novel platform for music memorabilia trading. This work reinforces the versatility of Design Fiction across domains and highlights its relevance in designing experiential and emotionally rich systems.

Based on these works, we realized that Design Fiction has proven to be a practical approach for supporting creative processes, exploring subjective values, and anticipating the social implications of emerging technologies. However, there is still a significant gap in its application within digital games, especially in the early stages of game development—moments in which fundamental decisions about narrative, mechanics, and player experience are made. Unlike the studies above, this work investigates the use of Design Fiction as a support technique for requirements engineering in digital game development, aiming to understand its feasibility and effectiveness in identifying software requirements. Creating fictional scenarios in this context also aims to gather feedback from developers, enabling continuous iterations and improvements in the game's conception.

4. Research Design

4.1. Design Fiction Planning

The first stage of Design Fiction involved planning and creating the instruments adopted in the study, including the narrative and visual artifacts used during the Design Fiction session. These artifacts provide an immersive and provocative experience that stimulates participants' imagination and fosters the emergence of requirements related to narrative, experience, and interaction for the game under development.

To support the execution of the experiment, we employed tools from G Suite

(Google Workspace)[1], which facilitated communication, material sharing, and data collection. The instruments developed for the experiment were as follows: (i) **Consent form**, which ensured the confidentiality of the provided data and the anonymity of participants; (ii) **Characterization questionnaire**, designed to gather detailed information about the participants' profiles, including prior knowledge in Requirements Engineering (RE), familiarity with Design Fiction, as well as their player types and preferences (see more details in Subsection 4.3). (iii) **Study script document** containing detailed instructions for conducting the experiment and the Design Fiction sessions, as well as guidelines for moderators; (iv) **Introductory presentation on Design Fiction**, with theoretical explanations, examples of Design Fiction applied in other areas, and guidance on the expected role of participants during the Design Fiction session; (v) **Six Fictional Narratives** (narrated videos, illustrative images, and storyboards), each representing a distinct narrative situation within the game universe; (vi) **Post-study evaluation questionnaire**, based on the constructs of the Technology Acceptance Model (TAM) [Venkatesh e Davis 2000], with closed-ended questions and an open-ended question for qualitative feedback on the experience with Design Fiction; (vii) **Online room**, created via Google Meet, for conducting the synchronous session with participants.

Two additional researchers with expertise in the field reviewed all study instruments. Based on the received feedback, we identified issues or ambiguities that were addressed through revisions, and new versions were developed.

4.2. Game Characterization

The study was conducted based on a real digital game development project in the Survival Horror genre, which is currently in pre-production. A multidisciplinary team from a software startup is developing the game, bringing together designers, developers, and writers who collaborate to shape its narrative, mechanics, and setting. The initial plot of the game, which serves as the subject of this work, revolves around a protagonist involved in a personal investigation marked by supernatural events and atmospheric psychological tension. The fact that the game was in its early development stage provided a concrete opportunity to apply the Design Fiction technique, allowing the ideas that emerged during the session to influence design decisions and project requirements directly. In this way, the Design Fiction activity with participants was grounded in a real project, contributing to the study's practical relevance and applicability of the results obtained.

4.3. Participant Characterization

The Design Fiction activity involved seven participants with diverse professional and academic backgrounds. We invited them through convenience sampling, using contacts in the educational and software industries. Table 1 shows a detailed profile of the participants. Their ages ranged from 18 to 40 years, including four undergraduate students and three professionals with either technical training or postgraduate education; one was pursuing a master's degree. All participants reported having knowledge of programming and some familiarity with digital games, software requirements, or project development, whether in academic or professional contexts. In addition, we collected each participant's player profile based on the archetypes proposed by Bartle (1996), including explorer, achiever, socializer, and others. The aim was to understand how gaming preferences influenced their contributions during the Design Fiction sessions, particularly in proposing interactions, narratives, and immersive elements. We observed a predominance of narrative, creative, and exploratory profiles — traits that may

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[1]https://workspace.google.com/

enhance engagement with speculative activities and involvement in fictional discussions. It is worth noting that participation was voluntary, as participants signed an informed consent form.

Table 1. Visão geral dos participantes do estudo.

ID	Idade	Gênero	Formação	Exp. em ER	Perfil de Jogador
P1	18–25	Feminino	Curso Técnico	Nenhum conhecimento	Socializador, Criativo, Narrativo
P2	18–25	Feminino	Graduação em andamento	1+ projeto/atividade em aula	Narrativo
P3	18–25	Masculino	Graduação em andamento	1+ projeto/atividade em aula	Narrativo
P4	18–25	Feminino	Graduação	1–4 projetos na indústria	Explorador, Socializador, Criativo, Narrativo
P5	36–40	Masculino	Pós-graduação (Mestrado em andamento)	1–4 projetos na indústria	Explorador, Conquistador, Narrativo
P6	18–25	Masculino	Graduação em andamento	1+ projeto/atividade em aula	Competidor, Conquistador, Criativo
P7	18–25	Masculino	Graduação	1–4 projetos na indústria	Explorador, Competidor, Narrativo

4.4. Design Fiction Session

We conducted the Design Fiction session synchronously with the participants, lasting approximately 1 hour and 30 minutes, and we scheduled it in advance. The session began with a brief introductory presentation of about five minutes. This presentation covered the conceptual foundations of Design Fiction, provided practical examples in various real-world contexts, and explained the roles of the participants in the activity. This introduction aimed to align participants' understanding and prepare them to interact with the materials produced.

Next, we presented the seven fictional narratives we developed for the study. We conceived these fictional narratives sequentially to represent key moments in the protagonist's journey within the game. We introduced each scenario through a short, narrated video with an average duration of two minutes, produced using illustrative images and storyboards that contained scene descriptions, objects, and atmospheres. The videos used first-person voiceover narration from the protagonist's perspective, enhancing participants' immersion in the fictional universe. The production of the materials followed the principles of diegetic prototyping, a characteristic of Design Fiction, in which speculative elements are inserted coherently and contextually within a believable narrative world. Below is an example of one of the scenarios explored during the session.

> Wagner begins recording, explaining how he became involved in this mysterious case—his motivation, his quest for redemption, the weight of losing his late sister, and the hope of finding answers that might somehow bring peace to this painful past, especially after the disappearance of his brother's daughter. As Wagner drives along the deserted road, he looks out the window, taking in his first impressions of the town. The place seems too quiet, frozen in time, but something feels wrong. What will he find in this town? A sense of unease begins to grow. Eventually, Wagner arrives at the hotel. The building has a classic look, but something about its architecture and atmosphere feels forced as if it's trying to hide something. He has no idea what awaits him inside. At the front desk, Wagner is greeted by a receptionist with an unsettling gaze. He seems to know more than he lets on. The atmosphere is strange, and for a moment, Wagner feels like he's being watched—but he chooses to ignore it. Determined to investigate, Wagner ventures into the forest near the hotel. There, among the dense trees, he finds a strange symbol carved into a stone—the same symbol that would later become an essential clue in the mystery. Wagner realizes the hotel's facade bears the same symbol he saw and sketched in the forest. Back at the hotel, Wagner notices a shift in the atmosphere. The place feels even darker, and he observes the staff whispering to each other, trying to hide their nervousness. Something is wrong, but he doesn't know what. When he returns to his room, Wagner is shocked to find it ransacked, as if someone had been searching for something. Panic begins to set in, and he realizes he is no longer alone—he is being watched. Now aware that he is at the center of something much bigger than he ever imagined, Wagner understands that he is under surveillance. With every step, more questions arise, but the answers feel increasingly out of reach. What is happening in this place? And who is behind it all?

After presenting each video and its accompanying artifacts, we invited the participants to reflect on the scenario and answer the guiding questions. These pre-defined questions

acted as creative triggers for imagination and co-creation, encouraging participants to envision narrative developments, propose interactions, suggest game mechanics and interface elements, and identify emotional and symbolic implications. An example of a question was: "After the protagonist finds his room ransacked (at the end of the first act), how do you imagine the plot will unfold from there?" The responses were discussed orally during the session, often enriched by comments from other participants, creating a collective interview dynamic with elements of a focus group. This collaborative structure facilitated the collective construction of ideas, allowing for the reinterpretation and expansion of elements within the fiction.

Throughout the session, the researchers acted as moderators, encouraging active participation, maintaining focus on the study's objectives, clarifying doubts, taking notes, and posing follow-up questions as needed. The entire session was recorded, with the participants' consent, and later transcribed for qualitative analysis. The content generated during the discussions served as a basis for identifying functional and non-functional requirements, emphasizing the experiential elements characteristic of the Survival Horror genre. The selection of the six scenarios aimed to represent different dimensions of the in-game experience, including building suspense, exploration, player decisions, interaction with characters, and discovering clues. We intend to encourage the emergence of requirements that go beyond purely functional aspects, also exploring the emotional and symbolic layers of the game. All videos and materials are available in the Figshare repository[2].

4.5. Feedback Collection on the Use of Design Fiction

At the end of the Design Fiction session, we invited participants to complete a post-study evaluation questionnaire (see Table 2) to gather structured feedback on their acceptance of the Design Fiction concept. For this, we used an instrument based on the TAM [Venkatesh e Davis 2000], which is widely adopted by researchers to assess users' perceptions of adopting new technologies or methods. The TAM includes three leading indicators: Perceived Usefulness (PU), the degree to which the subject believes that technology can improve their performance at work; Perceived Ease of Use (PEU), the degree to which the subject believes that using the specific technology would be effortless; and Self-predicted Future Use (SFU), the degree to which a subject thinks they will use the technology in the future. We focus on these indicators because they are strongly correlated with user acceptance of the technology. In this questionnaire, the subjects answer according to their degree of acceptance regarding the usefulness, ease of use, and self-predicted future use of the Design Fiction experience. Users responded on a five-point scale (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree).

Table 2. Questions used in the TAM questionnaire

Item	Statement
PU1	Using Design Fiction improves my performance in requirements elicitation.
PU2	Using Design Fiction increases my productivity when eliciting requirements.
PU3	I believe Design Fiction is useful in supporting developers during requirements elicitation.
PU4	Design Fiction was clear and easy for me to understand.
PEU1	Using Design Fiction did not require much mental effort.
PEU2	I think Design Fiction is easy to use.
PEU3	I find it easy to remember how to perform tasks using Design Fiction.
SFU1	Given that I have access to Design Fiction, I foresee myself using it in the future to support requirements elicitation.

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[2]Available at: `https://figshare.com/articles/media/Cen_rios_Design_Fiction/28692560?file=53307356`

In addition to the closed-ended items, the questionnaire included an open-ended, qualitative question that asked participants to share their perceptions of the experience with the technique freely.

5. Results

Applying *Design Fiction* to the participants resulted in a significant set of narrative, mechanical, and experiential contributions. We organized each suggestion with unique identifiers, which allowed us to evaluate their usefulness and justify the decision to adopt or discard each proposed idea. In total, we collected **68 suggestions**, of which **59** were considered helpful to the project, and we discarded **nine** based on creativity and adherence to the game's proposal. For instance, one suggestion proposed that each player's failure should dynamically alter the game's narrative. Although conceptually interesting, it was deemed overly complex for the team's current scope and level of experience in game development. Another discarded idea cited Alien: Isolation as a reference for the inventory system. While valid, the team opted to follow a design direction more aligned with classic Resident Evil-style inventories, favoring familiarity and consistency with the intended survival horror tone. These examples illustrate how feasibility and thematic coherence were key factors in curating the final design elements.

From the validated suggestions, we created **28 user stories** containing the title, description, requirement classification (functional or non-functional), and the identifier(s) of the suggestions that originated them. Among these user stories, we classified **12** as functional requirements and **16** as non-functional, reflecting technical aspects and elements related to setting, interactivity, and player experience. The designed user stories will be of great importance for the pre-production stage since they emerged directly from the perspective of potential users familiar with the Survival Horror game genre.

The analysis of the responses to the TAM questionnaire reveals a broadly positive acceptance of the Design Fiction technique among participants. As illustrated in Figure 1, all eight questions received responses predominantly concentrated in the Agree and Strongly Agree categories, with no occurrence of the options Disagree or Strongly Disagree. The first four questions (PU1 to PU4), related to Perceived Usefulness, yielded consistent results, with 86% of participants strongly agreeing and the remaining 14% agreeing, indicating unanimous acceptance regarding the technique's value for performing the proposed tasks. A slight variation was observed in items PEU1 and PEU2, related to Perceived Ease of Use. For PEU1, 57% of participants strongly agreed, while 43% remained neutral. For PEU2, 71% strongly agreed, and 29% were neutral. These results suggest that although Design Fiction was considered accessible by most participants, some exhibited a more cautious view regarding the ease of applying the methodology. PEU3, concerning the ease of remembering how to perform the tasks, received the highest approval rating (100% agreement), indicating strong potential for reusing the technique in similar contexts. Finally, SFU1 had 86% agreement and 14% neutrality, continuing the overall positive trend, although suggesting that a minority of participants may be uncertain about using Design Fiction in the future. In summary, the results indicate that participants considered Design Fiction a practical and applicable technique, likely to be used in future contexts, particularly due to its contributions to creativity, clarity of requirements, and collaborative engagement.

Regarding the open-ended question, it is possible to observe that Design Fiction was frequently associated with participants **promoting creativity, innovation, and requirements definition**, as indicated by P1, "*Design Fiction will help a lot in game design [...]. It gives a perfect sense of how the game will look.*" P3 also highlighted the connection between Design Fiction and the target audience's perspective: "*a great way to identify requirements based on*
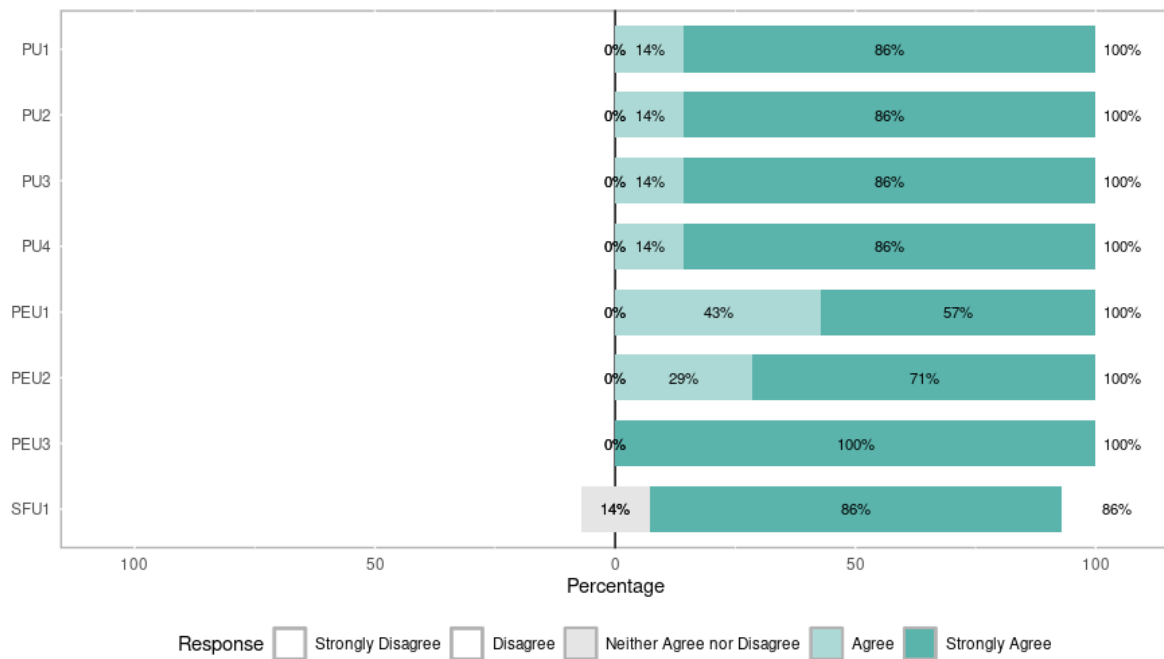
Figure 1. Participants' perceptions of Design Fiction.

the opinion of the public or people who know the area". The idea of **exploring possibilities speculatively** was also emphasized, as pointed out by P2: "*allows exploring possible scenarios creatively and speculatively [...] helps anticipate challenges, stimulate innovation, and think of solutions without the limitations of the present*".

Participants also recognized the role of Design Fiction in projecting a **more precise and detailed vision of the final product**, including visual, narrative, and sound elements. P1 emphasized, "*the colors, the imagery, the story's plot, the music [...] help think about who the end consumer will be.*" P5 commented that the technique contributed to improvements "*[Design Fiction] helped identify gameplay elements, such as lighting and corridor layout*". The clarity provided by the artifacts was highlighted by P6, who stated: "*they helped idealize and have a better vision of the game as a whole.*" Another highlight in the responses was the **engagement and collaboration promoted by Design Fiction**, which created a dynamic and participatory environment. Participant P6 compared the experience to a focus group, mentioning that "*the discussions generated at the time with other participants made the process more dynamic [...] discussing with potential users/experts to get more ideas, in my opinion, always works.*" Similarly, P5 stated: "*makes participation more interesting*", highlighting Design Fiction's role in sparking participants' imagination.

Although most comments were positive, there was a remark made by P4, who considered Design Fiction **more useful for beginners**, that is, for those just starting in the game development area: "*this type of technique seems more useful for those who don't have much experience.*" Still, the same participant acknowledged the creative value of the approach by stating: "*I thought it was fun. I like thought experiments and creating things.*"

As demonstrated by the results, the application of Design Fiction extends beyond mere requirements gathering, positioning itself as a strategic methodology with tangible impacts on the gaming industry, particularly during the pre-production phase. In practice, generating a high volume of validated suggestions (59) and translating them into user stories (28) before

core development begins represents an effective form of risk mitigation. Studios can utilize this approach to validate high-risk concepts and align the product vision directly with the target audience's expectations, thereby reducing the likelihood of costly rework in later production stages. The predominance of non-functional requirements (16 versus 12 functional) highlights the technique's potential to define and prioritize experiential aspects—such as atmosphere, pacing, and immersion. These elements are crucial for the commercial success of genres like Survival Horror but are often difficult to articulate in traditional design documents. Furthermore, Design Fiction serves as a powerful tool for aligning multidisciplinary teams. By creating fictional artifacts that convey a clear and evocative vision of the final product (as cited by P1 and P6), the methodology facilitates communication among designers, artists, programmers, and even marketing teams, ensuring that all stakeholders share a cohesive understanding of the intended player experience. Therefore, its implementation in the industry can lead not only to a more user-centric design but also to a more cohesive, innovative, and commercially resilient development process.

In summary, the results indicate that Design Fiction was a versatile and well-accepted approach among participants. It promoted both the generation of relevant project requirements and the creative and collaborative engagement of those involved. Design Fiction proved particularly effective in supporting the definition of experiential, narrative, and immersive aspects—key elements in developing digital games that focus on player experience.

6. Discussion of Results and Final Considerations

The results obtained from applying Design Fiction highlighted its potential as an innovative methodological approach for eliciting requirements in digital game projects. Our quantitative results from TAM indicators showed high levels of agreement. These findings align with those of Darby *et al.* (2018), who advocate using Design Fiction as a user-centered and engaging approach to gathering speculative requirements in contexts with high uncertainty or innovation. They also align with the findings of Penney *et al.* (2023), who employed Design Fiction to elicit requirements for educational conversational agents, highlighting the technique's potential to anticipate and structure future visions of use. The qualitative results revealed that participants perceived Design Fiction as a technique that enhances the conceptual clarity of the product, promoting a more detailed and tangible view of narrative, visual, and interactive aspects. This reinforces the idea that Design Fiction acts as a bridge between stakeholder expectations and project technical decisions, serving as a mediator between technical and conceptual visions — a critical gap pointed out by [Sutcliffe et al. 2022], especially regarding the fragmentation between traditional RE and technological acceptance approaches.

Design Fiction proved effective in identifying functional requirements and stimulating participants' creativity, capturing subjective and experiential dimensions related to setting, narrative, and emotions evoked during the player experience. As observed in previous works discussed in Section 3, the results of this study also indicate that Design Fiction facilitated the anticipation of user needs, particularly by enabling participants to visualize possibilities of narratives, gameplay, and interfaces based on the presented scenarios.

These results relate to Sutcliffe *et al.* (2022) discussion of soft requirements, which encompass values, feelings, and expectations that are difficult to anticipate in the early stages of the project. The author also emphasizes the importance of techniques that can reveal such emerging aspects in systems focused on user experience, such as digital games. In this sense, Design Fiction aligns with this proposal by creating immersive scenarios and diegetic narratives that allow participants to project themselves into the system's use, generating requirements that would hardly emerge from traditional requirements engineering methods.

In addition, we collected perceptions from the researchers responsible for conducting the technique. The reports reveal critical dimensions regarding the potential benefits and practical limitations of Design Fiction in the context of requirements engineering for digital games. The researchers noted that the game's genre (Survival Horror) may have enhanced immersion, leading participants to provide richer and deeper contributions, including symbolic and emotional aspects that would be difficult to elicit through more analytical RE techniques. Furthermore, unlike traditional RE techniques commonly used in game development, such as interviews, brainstorming, storyboards, or storytelling, Design Fiction stands out: it integrates cognitive, emotional, and narrative levels by proposing a participatory experience within a fictional universe. This engages participants more deeply, allowing them to immerse themselves in the game universe, interact with its elements, and propose solutions or developments based on simulated experiences.

Thus, Design Fiction is an early mechanism for creative iteration, enabling the exploration, discussion, and adjustment of key project elements even before technical prototyping. This narrative prototyping becomes more relevant in light of contemporary trends in the gaming industry, which are moving toward more immersive, personalized, and technologically sophisticated experiences that involve artificial intelligence, augmented reality, and branching narratives. In the case of games like Survival Horror, whose impact is strongly tied to the emotional ambiance and the player's immersive response, this approach proves strategic. As Sutcliffe *et al.* (2022) points out, traditional functional requirements literature often fails to address this subjective layer of the user experience adequately, thus reinforcing the relevance of the methodological proposal presented in this study.

Another challenge concerns the time and effort required to apply Design Fiction. The applications require careful logistical planning in project environments with time constraints and limited human resources. Preparing narrative materials, organizing sessions, and analyzing the results — particularly transcribing and categorizing participants' contributions—demand considerable effort. Although these steps foster rich and immersive engagement, they may not be feasible in time-constrained or low-budget contexts, such as small game studios or projects with tight deadlines. Future work should explore ways to reduce its operational costs, such as asynchronous participation models, pre-built speculative templates, or integrating AI-assisted transcription and analysis tools.

Although Design Fiction is collaborative, not all participants may feel comfortable in collective exposure settings. This highlights the importance of creating psychologically safe environments to encourage equitable participation, a recurring concern in participatory and co-creative techniques. Finally, we note that Design Fiction reaches its most significant potential in contexts that require imagination and low technical requirements, such as digital game development. This perception, also noted by study participants and supported by the literature, reinforces the specific contribution of this work in applying the technique in a domain that values experiences, atmospheres, and emotions as central elements of the final product.

Although the results are promising, this study has limitations that should be acknowledged. The sample consisted of only seven participants, which may limit the generalizability of the findings to other digital game development contexts. Furthermore, all participants were known to the researchers, which may have positively influenced participant engagement and receptiveness to the application of the technique, as it could have created a comfortable and collaborative environment—resulting in a potential bias that favored the use of Design Fiction. However, this familiarity may also have negatively impacted the ecological validity of the study, as it does not accurately reflect the dynamics of more heterogeneous

groups or real-world professional contexts.

In response to our research question, the findings of this study indicate that:

> **Design Fiction is a valuable, engaging, and effective technique for eliciting, anticipating, and structuring functional and experiential requirements, fostering creativity and promoting alignment among professionals during the early stages of digital game development.**

As a follow-up to this study, we intend to conduct further investigations into the application of Design Fiction in several game genres and across different life cycle phases, including functional prototyping and gameplay testing. The need to study methodological variations of the technique is also highlighted, such as asynchronous or hybrid sessions, which may help mitigate the observed logistical challenges, including prolonged session durations and the analytical effort required for transcription and categorization. Another future work involves integrating specific taxonomies for digital game design and analysis, aiming to systematize the application of Design Fiction further. We believe that combining Design Fiction and game design taxonomies could help define more structured minimum scopes, supporting the development of a Minimum Viable Product (MVP) that aligns more closely with the experience, engagement, and innovation goals characteristic of digital game projects.

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