



# “It Started as a Joke”: On the Design of Idle Games

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## ABSTRACT

With idle games, active withdrawal from the game comprises an essential part of gameplay as players wait for the game state to change over time. This mode of interaction is paradigmatic for the change of roles technologies have in our lives. However, the design elements of idle games are less well understood, particularly from the perspectives of developers. We interviewed six designers of six different popular idle games and inquired into their individual approaches. Via thematic analysis, we refine and expand on existing definitions of idle games as a genre, shed light on ethically charged practices of care in their design, and identify shared core characteristics between the games and processes. We then generate intermediate-level knowledge on the design of idle games. Our work contributes designers’ perspectives on idle games and their design to a growing body of literature on the genre.

## Author Keywords

Idle Games; Design; Thematic Analysis; Ambient Interaction

## CCS Concepts

•Human-centered computing → HCI design and evaluation methods; Interaction design theory, concepts and paradigms; Empirical studies in interaction design; •Applied computing → Computer games;

## INTRODUCTION

Idle games live in the margins of digital games and automated applications. This nascent genre of games requires little or no player interaction [2]. Players engage with them seriously [3, 66] as well as casually [37]—often within the same game.

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The design of these games appears to aim for alternative play scenarios and reformulates the range of potential player experiences. Instead of a singular grand and momentous experience a traditional videogame is expected deliver in a specific setting, these games merge with everyday life, offering brief and casual engagements [30]. Seeing as one of the early idle games—*Cow Clicker* [G10]—was developed as part of an academic argument [7], researchers’ increased interest in defining the genre and understanding what *play* means here comes at little surprise. To this point, however, we lack a deeper understanding what it means to *design idle games*.

Inquiring into how designers of idle games engage with their material allows us to acquire insights into how these experiences are created and curated. Idle games offer a unique view into how future engagements with an increasing amount of ambient technologies—as in smart homes or tacit moment-to-moment engagements (e.g., fitness trackers)—can be investigated through playful designs. We were particularly interested in the motivations of idle game designers, as well as how they conceptualise the genre through their work and engage with their player population. Thus, we conducted semi-structured interviews with six developers across idle games with different characteristics and augmented these data with our first-person experiences of playing these games (akin to Höök [31]) as well as ancillary materials (e.g., news reports, reviews).

By means of thematic analysis, we gathered insights into idle game designers’ approaches towards designing. We contribute to human-computer interaction (HCI) and games research a qualitative perspective on the definition of idle games through designers’ viewpoints, a deeper understanding of the particularities of the genre and intermediate level knowledge [32] on the design of playful technologies for interrupted engagement.

After discussing previous work on the genre, we account for our methodological choices in this research and illustrate the corpus of data that was part of our eventual analysis. We then show our results along the themes we identified before we discuss the implications of our research for a more fine-grained definition of idle games as well as some implications for their design before we conclude our paper.

## BACKGROUND

Idle games have already attracted a fair amount of attention within the HCI and games studies communities (e.g., [2, 18, 22]). We present previous work related to the definition of idle games and players' experiences to illustrate how designers' perspectives on them can enrich our current knowledge.

### Definition of Idle Games

Games such as *Dungeons & Dragons*, *Pandemic*, *Super Mario World*, etc. demand continuous attention from a player, and create an intrinsic experience of play between the player and the game. Idle games, on the other hand, tend to *play themselves*, requiring little to no player interaction [5, 18, 38].

Fizek defines idle games as those in which humans are spectators and that playing is mostly an activity of game itself [22]. Without player input, these games will progress slower, but, conceptually, never come to a close (with exceptions, as we discuss below). The pleasure in engaging with these games is derived from progression without actualised play, or the “act of outsourcing gameplay onto the game” [ibid, p142].

Alharthi et al. develop a taxonomy on two dimensions: categorisation along key features (e.g., micro-management, single-resource, multi-player) and continuum of interactivity requirements ranging from clicker to zero-player [2]. They state that “[o]ne of the main characteristics of idle games is a strong support for playing less. Idle games, in general, feature a balance between rules that encourage players to leave the game and rules that reward them for returning” [ibid, p8]. Designing for engaging experiences then requires developers to create a fine balance between these differently rewarding rules. As our working definition we understand that the core feature of idle games is that they *require players to leave the game and return to it at a later, unspecified point, where the game progresses on its own during that time and opens up different options for further play upon return*.

### Playing Idle Games

Idle games allow players to casually and effortlessly drop into and out of play. Compared to a related genre, casual games, they appear not to have a distinct player population. Most players appear to also regularly engage with more traditional video games [66], which often played simultaneously [12].

Keogh and Richardson demonstrate the nuances of values and practices in playing idle games, where *waiting* becomes part of the play and *paying-to-not-wait* is frowned upon. “[Players] consistently expressed a sense of satisfaction in the *act of waiting* for the menial tasks to be completed, even setting the self-imposed goal to *never* spend money.” [37, p24] (emphasis in the original). Cutting et al. emphasise the direct and indirect sociability inherent in idle games, which is surprising as most games are conceptualised as single-player [16].

Through multiple autoethnographic accounts, Alharthi et al. could establish foreground and background engagements as paradigmatic for playing idle games [3]. Foreground interaction occurs directly with the game interface and background interaction happens when players record their play through external software (often spreadsheets) and consult additional

sources to inform their planning [ibid]. We noticed that the experiences related to resource management in idle games can be described as akin to those in fantasy sports where players make small adjustments with limited information in complex environments (albeit with additional time pressure) [65]. Deterding could illustrate through their own playing behaviour that idle games are a prime example for games creating player experiences beyond the ones intended [19].

Hence, while the theoretical definition of idle games and players' accounts have already received some attention from the HCI and games studies communities, *designers' perspectives* on creating these games have so far been missing. We provide insights into their motivations, practices and approaches. Knowing about the parameters surrounding the design of idle games we can better define the genre and gain a more systematic understanding on how to design for similar interactions in idle games as well as other ambient technologies.

## METHOD

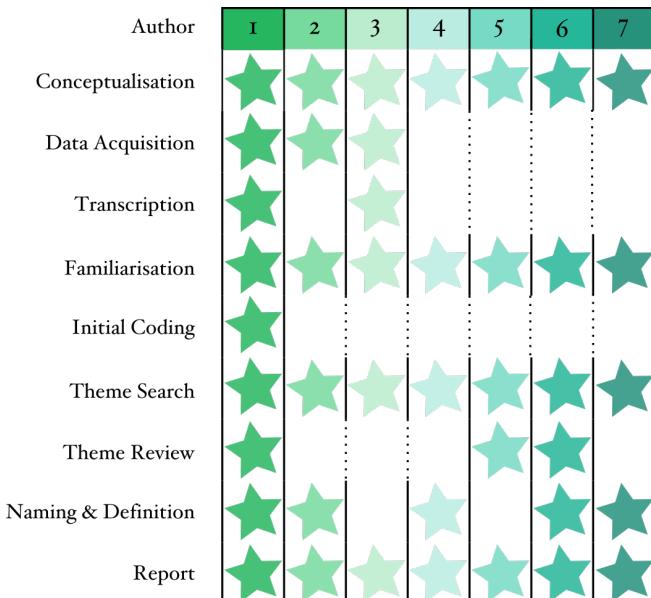
We approached our data within a critical-constructivist paradigm [26], which can be attributed to situated [28], phenomenological HCI [29]. Our analysis is interpretive in nature; other researchers might come to different conclusions on the same data set or enquire into the matter with different foci. The topic of idle games is a ‘matter of care’ [17] to us in that we engage with it through a personal passion and curiosity.

Interviews with designers have a rich tradition in HCI. Early interviews with system design engineers [27] and software designers [69] aimed at understanding their practices. Expert domain interviews with designers have created a range of different insights for design and research. Prior work has charted the waters of sex toy design [4], identified mismatches between HCI research and interaction design practice [25], established guidelines for movement-based game design [33], and guided the design of games for health [36]. Hence, interviews with idle game designers complement player accounts (i.e., [3, 16, 37]) and are an appropriate and well-established method for acquiring a rich data set detailing a design space from the perspective of lived experience and practice.

In our data analysis of the semi-structured interviews we followed Braun and Clarke's version of Thematic Analysis [10]. As a decidedly constructivist method, it is judged on the rigour of the analysis, the transparency of procedures, and the reflectiveness of researchers. Using this method positions us as *active* participants engaging in a dialogue with the data. It then matters, *who* conducts which parts of the research to assess researchers' individual contribution to a given project. Figure 1 illustrates the involvement of each individual author throughout the process in an aim of making our personal involvement in each part of the research transparent. Note that due to the strictly interpretivist nature of the method, inter-rater reliability is not required for the coding process to be meaningful; robustness of the analysis is rather determined through the collaborative discussion of themes [ibid]. Similarly, our results are not meant to be read as generalisable but, instead, as potentially transferable to other game genres or technological interactions with similar paradigms (i.e., Internet-of-Things devices in the home).

**Table 1. Interviewees and metadata.** Interview participants were asked what name to use; when we refer to them in text, we use either the indicated pseudonym or name. Interview types have implications for reporting: text chat is presented directly, video chat is transcribed. Attributes of the game are according to visual style (text vs. graphic), development context (professional vs. hobby), interactivity (zero-player via incremental/idle to clicker) and ending (finite or endless).

Name/Pseudonym	Title/Role	Game	Type	Online Sources	Attr.
Lucas Mills	artist	<i>Tap Titans</i> (2) [G7, G8]	text chat	[41, 42, 49, 52, 58]	gpce
Eric Fredricksen (Grumdrig)	sole developer	<i>Progress Quest</i> [G5]	text chat	[40, 48, 55]	thze
Jake Hollands	lead developer	<i>Spaceplan</i> [G9]	video chat	[20, 21, 60, 63]	gpif
Alma (bloodrizer)	lead developer	<i>Kittens Game</i> [G2]	text chat	[3, 43], <a href="https://www.reddit.com/r/kittensgame">/r/kittensgame</a>	thie
Frank Lantz	lead developer	<i>Universal Paperclips</i> [G3]	video chat	[11, 13, 24, 34, 39, 61, 67]	thcf
Ian Bogost	sole developer	<i>Cow Clicker</i> [G10]	video chat	[8, 14, 57, 59]	ghce



**Figure 1. Involvement of individual authors in different stages of the research**

While thematic analysis according to Braun and Clarke consists of six steps [10] (marked with [\*] below), our process in total encompassed nine distinct phases:

1. *Conceptualisation* refers to the creation of the overall research plan, application for ethical review and the selection of relevant interview partners.
2. *Data Acquisition* is the process of contacting potential interview partners and conducting the interviews.
3. *Transcription* is performed for video interviews and also relates to the preparation of chat protocols for the next steps.
4. *Familiarisation*[\*] with the data refers to an initial read and the jotting down of loose notes for potential codes and themes, which we then discussed within the research team.
5. *Initial Coding*[\*] of the data is done inductively without a codebook and leads to an overview of the different potential topics we initially identified. Examples include short codes such as *humour*, *history of idle games*, *player experiences*, *genre critique*, or *development context*.

6. *Theme Search*[\*] translates the multitude of codes into initial themes. An example for an initial theme was *Engagement through Genre Critique* and *Paradigm Shifts as Narrative*, which have shifted into our final themes below.

7. *Theme Review*[\*] comprises an additional step in which the previously identified themes are tied back into the data.

8. *Naming & Definition*[\*] is a refinement process for the themes when encountered with the data. It entails choosing illustrative quotes for the theme and connecting them meaningfully to prepare the...

9. *Report*[\*]. During the writing process themes become further refined and contextualised within existing literature.

The research was approved by the Ethics Review Board at the University of Waterloo. Participants received 10 CAD for participation, which they could opt to have donated to a non-profit organisation.

## CORPUS

With our sample of idle game designers, we cover the diversity of the genre regarding visual style (text-based vs. graphic), development context (professional vs. hobby), placement on the interactivity spectrum (zero-player via incremental/idle to clicker) [2] and form of ending (finite vs. endless). We identified 14 potential candidates through purposeful sampling [44] and were successful in talking with six different designers (see Table 1), who, along with their games, satisfied the constraints of representing a range of different instances across this space. As the table additionally shows, all of these games have different online sources attached to them, that discuss them critically and indicate popularity within the games community. Each interview lasted between 60 and 90 minutes, resulting in about 10 hours of material. Figure 2 additionally illustrates the range of visual styles. Larger pictures in higher resolution can be found in the supplemental material.

As idle games are a phenomenon within popular culture, we included a selection of relevant online articles to inform our interviews as well as our analysis (see penultimate column in Table 1). Implicitly, our analysis is also informed by multiple hours of gameplay with each of these games [G2, G3, G5, G7–G10] as well as others in the genre [G1, G4, G6, G11–G16], which informs our analysis through the personal experience of playing as first-person data [1].

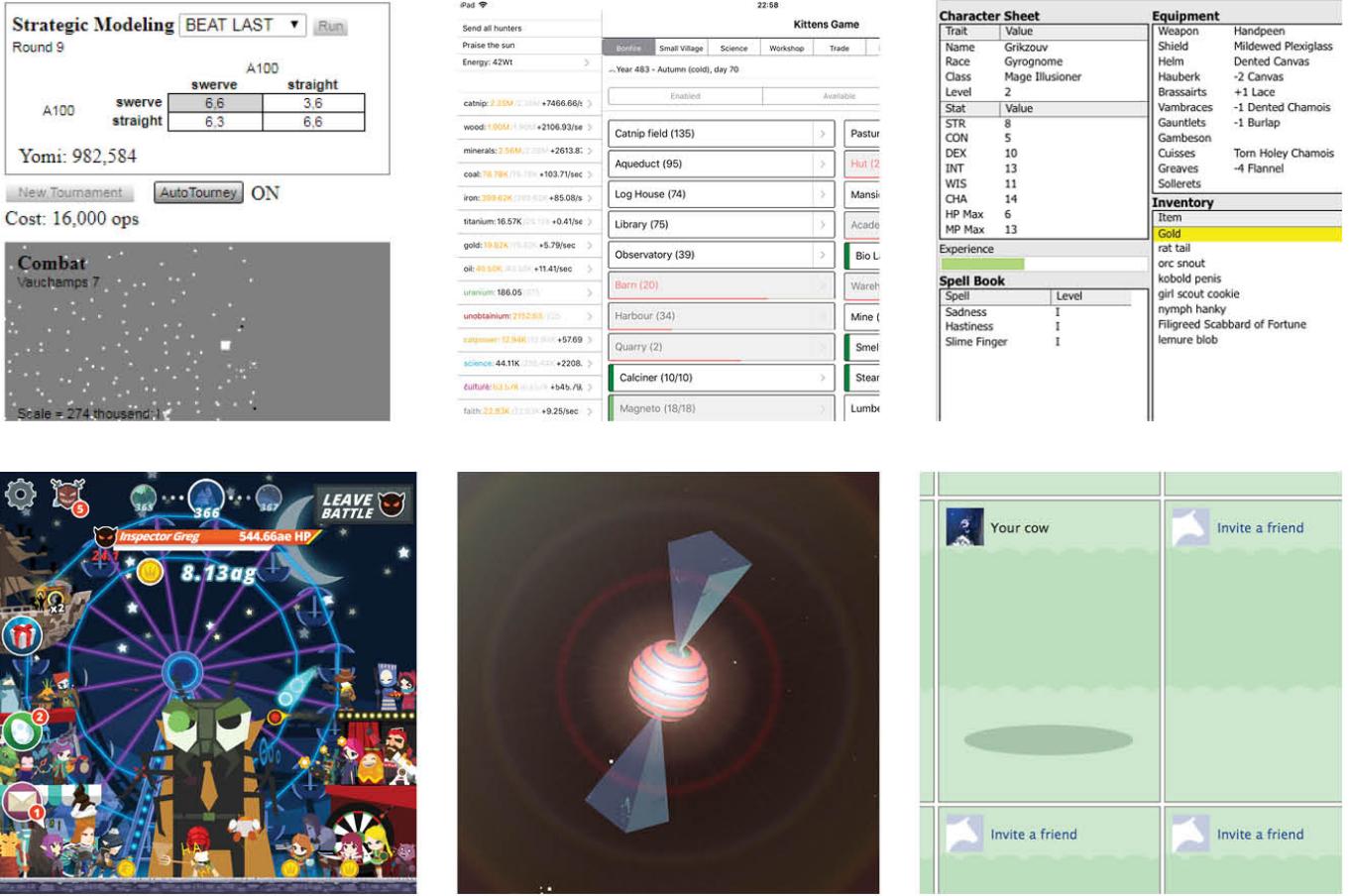


Figure 2. Visual elements of the games represented in our corpus. Top Row (from left to right): *Universal Paperclips*, *Kittens Game*, *Progress Quest*; Bottom Row (from left to right): *Tap Titans*, *Tap Titans 2*, *Spaceplan*, *Cow Clicker* (after the rapture).

## RESULTS

Through our thematic analysis, we identified five core themes surrounding the design of idle games. While taking *attention to the absurd* as a starting point, game designers conceptualise the genre as consisting of *worlds inviting players* to participate, but not requiring them to. Further, we noticed how narrative is actualised in idle games along *systemic paradigm shifts*, and how *care for players*, as well as games, becomes relevant in the design process, which is largely driven by *personal interests*. We emphasise parts of each quote in bold to focus them in how they contribute in particular to the theme. Themes and subthemes have been given alphanumerical identifiers to be able to reference back to them in our design guidelines.

### Theme 1: Attending to the Absurd

During our interviews, there continually was a notion of taking an initially abstract concept and bringing it to its logical conclusion. The design and development of idle games seems to operate on the tension this process creates.

#### Incidental Development (1A)

**[O]riginally, it started as a joke project.** I found it fun and shared it on reddit, but it was never a “success” in a full sense of this word. – *bloodrizer*

Well, obviously, **it started as sort of a joke**, sort of highlighting video games are Skinner boxes, just sort of dressed up and I think that’s great how that happened.  
– *Jake Hollands*

Idle games appear to have the tendency to come into place without being fully conceptualised from the start. The subsequent development takes shape in the form of a repeated engagement with the initial joke within a more and more complex game—often due to players demanding more content.

It was a **long series of feedback loops** between what people did and how I interpreted what they did and sort of adjusted and revised the game. But by that time it was a different thing than when it started in some ways.  
– *Ian Bogost*

Hence, the design and development of idle games is inspired from a process of continuous engagement with something that can be brought to an absurd logical conclusion. Similarly, playing presents an opportunity for serious engagement with an absurd thought experiment.

As one interviewee shared with us, some game development companies practice engaging with absurd or overly consequential game ideas as a regular form of entertainment. Hence,

idle games as a genre, and the way they are developed, are embedded in a culture of attending to the absurd and then following through with it through an actualised game.

#### *Serious Play (1B)*

To the amusement or surprise of developers, these players treat the games as a source for focus and intrigue. Players' behaviour functions as an extension of the logical conclusions the idle games follow through.

[S]ome of our players **build spreadsheets or track down their progress and make calculations.**

– *Lucas Mills*

Beyond tracking one's progress and understanding the intricacies of the mechanics of a game, some players also exhibit nefarious behaviour. This allows them to appear as a longtime player, which is akin to a status symbol [35, 51].

[V]arious people have **hacked** the (simple) protocol for posting your character's stats, or **edited them themselves or otherwise cheated** themselves ahead.

– *Eric Fredricksen*

However, players engage with these games outside of what developers might have intended to communicate. They assign meaning to the absurd in their own ways and co-construct it with developers.

It's not even cows, it's just pictures of cows. **It's ridiculous!** But it's not more ridiculous than anything. (...) [Players] imbued them with meaning and **collective meaning**. They recognise those meanings.

– *Ian Bogost*

Hence, idle games are characterised by a deliberate attention to absurd and overly logical conclusions—in motivating design and development but also in play. What was once a joke might become an obsession, what was once a thought experiment a haunting elaboration on games and society.

#### **Theme 2: Non-Comittal Invitations to Play**

Idle game designers framed the genre as opening up alternative worlds for play. It is not immediately obvious what it means for idle games to be understood as a game world, especially when few feature representations of physical space.

#### *Analogy to Role-Playing Games (2A)*

Several designers compared idle games to role-playing games (RPGs). In their framing, RPGs had two elements. RPGs provided an opportunity to participate in low-stakes activities that allowed players to explore a game world, which made them “comfortable and relaxing” (Frank Lantz). At the same time, RPGs provided the reference frame for a paradigm of challenge and complexity.

It's an **accomplishment when you hit a new stage you've never reached**, or when you can finally buy the next hero that you've never seen before. Kinda like in RPG's or *Diablo* when you grind 'til you find some rare equipment that **suddenly makes you destroy enemies a lot easier than before** – *Lucas Mills*

When exploring this comparison, idle game designers referred not to the world and story of RPGs, but rather about the way their *systems* were structured and what those systems allowed. Instead of exploring a character [68], players explore the inner workings of a semi-automated system, that functions as an independent, encapsulated environment.

It's like having a car in a garage and it's like an engine and you're able to go like: “Oh, what happens if I tighten up this bolt?”, “oh what happens if I put an extra strap here?”, or like add another belt or put another cooler on this end. “What about three coolers?”, “what about...?” you know? And it **just allows you to kind of play with it**, to tinker with it. – *Frank Lantz*

#### *'Letting it run' as Form of Play (2B)*

What differentiates idle games from other types of game systems is that they can progress *without* player input. When players do engage, they tinker with a system, rather than encountering a confrontation that they can win or lose.

I had the idea of just **letting the game run your character** for you. – *Eric Fredricksen*

This understanding of idle games invites players to participate in the game world, but does not revolve around them. As bloodrizer put it, “You are, essentially, **not a center of the world but a spectator**, world goes on with or without you” (emphasis ours). This is massively decentering compared to the way we typically understand games, where a player's actions are treated with utmost importance.

#### *Systems as Worlds (2C)*

What idle games focus on instead are *game system processes* and the *game state*, which are understood as co-players or partners in producing the game. In particular, designers saw the game and the player as *handing off control* to one another, either based on how active the player wanted to be in their participation, or simply based on temporal availability.

What I'm aiming to do is, have it so that the game gets [to a certain point and] then **waits until you're ready**.  
– *Jake Hollands*

It's not just the asynchrony between players, like, I play a hand or something, but it's **asynchrony with the state, with the game itself**. Like, you're there and then you're not and you're there again. – *Ian Bogost*

Hence, these designers found a new way to complicate, and harmonize, the kind of play they found relevant: exploring a world and challenging a system. In an analogy to RPGs, in idle games, players explore worlds created by systems that do not require their input, but invite tinkering with.

Here is a game that in some ways just is about exploration and it is just some kind of a story world that you're in, and no matter what you do, you're just going to go about exploring it and at the same time that world you're inside of, it **allows you and it encourages you and it invites you to think and to analyse and understand the systems** that are happening in order to optimise them and improve them. – *Frank Lanz*

**Theme 3: Paradigm Shifts as Narrative Beats**

Game narratives have been historically criticised as being decoupled from the experience of game play: early debates in the field (e.g., [62]) revolved around the seeming disconnect between the activities of the player and the attempts of game designers to communicate a story using media forms like cutscenes and hypertext-style dialogue trees. As games have grown more sophisticated, designers have developed new techniques for communicating story through gameplay. In the case of idle games, the deceptive simplicity of the genre has afforded many opportunities to experiment with new playful storytelling techniques driven by systemic exploration.

*Advancing Narrative through Increasing Complexity (3A)*

My favorite concept is an idea of **paradigm shift**. Especially when you are not aware of it. In *Candy Box* you start with a single button and end with an rpg system, inventory and world map. In *Sandcastle Builder* you start with single picture and end with time travel and industrial production of sand. **This is something I tried to replicate and crank up to 11.** – *bloodrizer*

Our interviewees frequently drew a parallel between increasing the complexity of mechanics and the rising action of a story. This is a central conceit of many successful idle games: players begin doing a somewhat modest, quotidian activity—like making a paperclip or baking a cookie—and through the accumulation of related infrastructures unpack this activity into a world that spans civilisations and invokes vast universes of related phenomena. The mechanics and interface undergo multiple *paradigm-shifts* that parallel this expansion of the narrative scope by progressively disclosing more aspects of the system to be manipulated. The ever-mounting complexity of these games helps to create a sense of narrative momentum and rising action—things start small, slow and simple but then become bigger, faster, and more consequential.

The thing that *Kittens* did that I loved so much was **layering on of new systems**. You're learning a thing (...) and then they introduce a whole new system. And, understanding how this new system fits into the existing economy, where it fits in and how it fits and how that should change my decision making (...) So, a big part of *Paperclips* is this idea, that just **new things get layered on and taken away** and I'm just always **trying to switch it up**. So you **establish a rhythm, establish a pattern and you throw in a twist** and then you're just doing variations on that. – *Frank Lantz*

*Systemic Suspense (3B)*

Designers use core mechanics of these games to produce another key narrative poetic—suspense—that parallels the rising action of the story by scaling up the costs of new game mechanics along with the growth of the game's internal economy [45–47]. In addition to producing suspense, these mechanics can produce moments of surprise and dramatic climax.

That initial surprise of finding a first presence of something looming and big. **This revelation.** (...) **This initial "OH MY GOD, YOU GOTTA BE KIDDING ME"** is pure gold. – *bloodrizer*

**Table 2. Games and associated monetisation schemes.**

Game	Monetisation Scheme
<i>Universal Paperclips</i>	Commercial mobile version alongside free web version. Offers merchandise for sale.
<i>Kittens Game</i>	Commercial mobile version alongside free web version. Allows donations; offers Patreon for monthly donations.
<i>Progress Quest</i>	Discontinued: allowed donations (donate link is active, but buried).
<i>Tap Titans (2)</i>	Offers microtransactions; displays advertisements.
<i>Spaceplan</i>	Commercial mobile and desktop versions exist alongside free prototype version.
<i>Cow Clicker</i>	Discontinued: offered microtransactions.

In other cases, designers use mechanics of slow steady growth to give players a chance to stop and think about what is happening in the game, and about their choices. By alternating between periods of heavy clicking activity, and enforced idleness, they produce an ebb and flow in the narrative tension.

There are moments in the game that feel very easy, especially when you prestige and **pass through the beginning stages with ease**. And then when you **hit a wall** you start to think about what things you should be upgrading for your next run. – *Lucas Mills*

In *Universal Paperclips* [G3], Frank Lantz structures the game according to a classical three-act narrative structure. Each act is delineated by a complete shift in interface paradigms, and a scale-shift for both the mechanics of the game and the simulated storyworld. By employing this structure, Lantz creates an unusually circumscribed idle game.

I wanted it to be complete in that sense. I wanted it to have a **start, a middle and an end** and have a dramatic arc and then at the end, it's done and it lets you go.  
– *Frank Lantz*

Several of our interviewees expressed a desire to give players an opportunity to stop playing their games if they chose to, rather than requiring their players to remain forever trapped in a cycle of never ending logarithmic scaling. These reflections indicate a degree of concern from our interviewees about the potential of these games to lead to unhealthy, unending, play.

In my current idle game, that I'm working on, **I'm putting an ending there**. (...) I want the ending there as a milestone to say "**it's okay, you can stop playing now**. You've completed the thing." **I think that if it lacks that, then it's when you continue just going, going, and going.** – *Jake Hollands*

**Theme 4: Being Care-ful in Design**

Many of the interviewed developers expressed concern for their stewardship of players' resources. Interviewees discussed strategies around managing the addictive nature of idle games and identifying ethical monetisation schemes (see Table 2). We also address how the designers negotiate the sustainability of their games.

*Recognizing and Avoiding Addiction (4A)*

Our interview partners expressed an understanding of the potential addictiveness of idle games, which, due to the combination of being designed to progress even when not played and continuous reward schemes [51], could manipulate players destructively. Hence, some designers shy away from creating games that exploit this manipulative capacity, also because of their own played experiences with the genre.

Of course, it is, by nature, so addictive that it can easily be exploited for microtransaction etc. etc. (...) To be honest most idle games, that I play, I get addicted to them, and **I feel really unhealthy about playing them.** (...) The only time I stop playing them is when I sit back for like a day without touching it. – *Jake Hollands*

Idle games lay bare a core loop that drives interaction. A key issue centres on the reward structures used by such games, and a level of uncertainty in outcomes, which drives players to interact frequently [45–47].

[T]here is an absolute basic, the most primitive loop. semi-random reward that is constant, but a bit unpredictable. (...) [A]ll games operate on [a] **dopamine mechanic**. [I]f you think of [Cookie Clicker] there is not much difference, from ... [Final Fantasy] ... you kill lvl1 monster, get 1gp, buy lvl1 sword, kill lvl2 monster. the only difference is that [Cookie Clicker] **distilled this to the absolute bare minimum.** – *bloodrizer*

Idle game designers take their ethical responsibility for their players seriously. Designing idle games requires them to carefully approach addictive qualities even if those promise quick and easy monetisation schemes.

*Monetisation (4B)*

Microtransactions, where players pay small amounts of money for in-game content, and advertisements are the funding source of a number of idle games, including some of those in our corpus (e.g., [G7, G8, G10–G12]). At the same time, many of our interviewees considered microtransactions to be an unethical way to monetise idle games. A popular alternative appears to be to accept donations or use other mechanisms to enable players to contribute to further development.

I **briefly had a donate link** on there at one point, and people were using it, but I didn't feel like I needed or wanted that for *PQ*, so I took it down. (Well, it's still buried deep in the site and every couple years someone sends \$10 or something.) – *Eric Fredricksen*

Bloodrizer also experimented with donations that boosted the overall production for all players, the CMBR mechanic<sup>1</sup>, but then discontinued it due to unspecified reasons.

**CMBR is discontinued starting today** - It was fun and interesting concept (though it never quite got out of **ethical limbo**), but it does not really work.  
– *bloodrizer* on r/kittengame<sup>2</sup>

<sup>1</sup>Diegetic: “Cosmic Microwave Background Radiation (CMBR)”.

<sup>2</sup>[https://www.reddit.com/r/kittengame/comments/5mixct/cmbr\\_is\\_discontinued\\_starting\\_of\\_today/](https://www.reddit.com/r/kittengame/comments/5mixct/cmbr_is_discontinued_starting_of_today/)

More recently, a Patreon was set up for the continued development of *Kittens Game*<sup>3</sup> [G2], since the designer assumes that the game would not survive as a premium game. Others, though, have seen opportunity in offering idle games as more premium experiences, without optional purchases.

I really like what *Clicker Heroes* have done with their new game. (...) Selling it for (...) \$30, I'm a big fan of just **premium games rather than microtransactions.**  
– *Jake Hollands*

Several games began their life as web browser games (e.g., [G2, G3]), but transitioned to paid mobile applications. Players have an interest in playing such games away from the computer [37], and mobile versions readily offer the opportunity to tap in and out of gameplay.

*Designing for Sustainability (4C)*

Many idle games attempt to avoid expending computational resources when not foregrounded. By default, most games, including idle games, run a discrete simulation loop in which the game state is modified at a constant interval [50]. Since a key component of idle games is *passive idling*, this runs into ethical concerns about use of environmental resources.

The early versions (...) were **idling like a car idles like burning fuel in place, not going anywhere, wastefully idling.** (...) But that status didn't maintain itself.  
– *Ian Bogost*

Many idle games include the ability to use a low-power mode while the game is not in focus or provide game mechanics that enable progression while the game is not running. Such capabilities are accomplished in one of two ways: using longer time steps [G2] or disabling graphics [G9]<sup>4</sup>. In both cases, rather than running the simulation on an interactive loop, the game can mark the time when it was set to idle and check the time when the player returns. The intervening time delta is used to calculate new value for resources and other game states. The result is that the same computation can be accomplished once with a minimal number of CPU cycles.

Ultimately, designing idle games is a *matter of care* [17] for our participants in three ways: caring for the well-being of players, caring about ethical conduct in a capitalist context, and caring about the sustainability of their games.

**Theme 5: Personal Play as Motivator for Design**

For the designers we interviewed, being personally invested in the design of a game stems from their personal practices of playing idle games. In their own designs, they aim at expressing critique, but also take the minutiae of game development as an opportunity for learning.

*Designing for Expressiveness (5A)*

The simplicity of the genre enables the actualisation of the aforementioned absurd ideas with relative ease, compared to the development of more conventional games. Designers then

<sup>3</sup><https://www.patreon.com/bloodrizer>

<sup>4</sup>Presumably *Tap Titans* [G7] and *Tap Titans 2* [G8] both do both, which is embedded in the functionality of mobile operating systems.

intend to provide players with alternative narratives and experiences that function as a crystallising point for actualised critique and commentary on the genre as a whole.

One of the reasons why I started working on *Kittens* was because **I was sick of games** like *Puppy Clicker* or *Something Clicker*. – *bloodrizer*

These played experiences also attract the attention of more commercially oriented decision makers. Hence, even outside of a hobbyist environment, the serious attention idle games might receive adds not only on production value, but also supports the livelihood of several employees in consequence as can be seen by the number of studios publishing idle games (e.g. [G4, G7, G8, G11, G12]).

#### *Idle Game Design as DIY Projects (5B)*

Our interviewees, particularly the ones designing idle games as single authors, largely designed their games initially as personal tokens only. The design of idle games can subsequently be understood as a craft, embedded in do-it-yourself (DIY) culture [56, 64], in which producing and sharing is simple and accessible to many.

The simplicity of the genre enables non-designers to engage in designing personal projects. Idle games require little to no financial support to update and maintain, and can be easily published and shared online (e.g., via Kongregate). The richness of idle game production suggests it democratises game design by enabling engaging experiences with comparatively low effort. As an example, Lantz refers to how designing *Universal Paperclips* [G3] was driven by a desire to exercise and improve personal programming skills.

I wanted something simple to execute, because **I started *Universal Paperclips* as a kind of an exercise in programming**, improving my programming skills and I am not a great programmer, so **I wanted something simple**, that I could build on my own from start to finish.

– *Frank Lantz*

We observe here a case of *learning through designing idle games*. This is possible as many of the design decisions in creating idle games are focused on building the underlying mechanics of the game, creating economic models, and balancing computationally charged tensions within the game [45]. While text-based idle games, such as *Kittens* [G2] and *Universal Paperclips* [G3], might look deceptively simple at first, they reveal impressive depths including finely tuned reward curves and economic models [2]. The underlying complexity of idle games has the potential to inspire new ways of introducing individuals to different programming skills. The result may well be another idle game opening up a systemic world through which players can safely explore a narrative.

## DISCUSSION

Our findings lead us to construct a rich detail on the motivations and drivers idle game designers have when creating. We now discuss the implications of their contributions to a the definition of the genre, draw out intermediate level design guidelines as well as some actionable insights and then con-

textualise these with the potential for the design of ambient technologies more generally.

### **(Re-)Defining Idle Games**

Designers have individual conceptualisations of idle games. Our findings allow us to refine previous definitions and detail the implications for how we define play in idle games.

#### *Beyond Interactivity*

Previous research aiming at a working definition for idle games as a genre has discussed them through their functional qualities [22] or taxonomised them along key features and level of interactivity [2, 5]. In our interview data, we could additionally explore more systematic and aesthetic qualities of idle games.

Beyond the frequency with which players interact with an idle game, our data shows how we can understand them as *explorative systems* (Theme 2 & 3). Designing for player experiences in idle games then means fine tuning the inner workings of a system through offering options, allowing for a range of exploratory decisions and tweaks regarding local and global optimisation – with little consequences of failure due to common prestige mechanics. As Fizek stated, player input is not necessary to keep a game running [22], but player input then determines *how* the game develops.

Our interviewees further conceptualised the progress in idle games as *a narrative that is intertwined with system changes* (Theme 3) or “paradigm shifts”. Whenever the system changes and players encounter a new cycle of exploration, experimentation and optimisation, a new beat in the narrative unfolds. These shifts can be intentionally designed for (as is the case with *Universal Paperclips* [G3], *Spaceplan* [G9], *Progress Quest* [G5] and, to some extent, *Kittens Game* [G2]) or develop through continuous engagement and procedural progress more incidentally (as is the case with *Tap Titans* [G7, G8] and *Cow Clicker* [G10]). While the design and development might predominantly be viewed as preparing a system for exploration, the designers we interviewed found themselves creating a narrative for players to engage with. Hence, we propose to define idle games not only through their frequency of interaction, key features and the tacit nature of engagement, but also as *narrative systems*.

Finally, when Alharthi et al. discussed idle games, one of their core characteristics was the technical endlessness of the games [2]. They did not account for idle games that have a distinct ending in their narrative (such as is the case with [G3, G9, G14]). Hence, we also propose a rejection of this criterion as core to the definition of the genre. Instead, we suggest understanding the *paradigm shifts* as temporary ending in any idle game whether they allow for continuation after one or not. Many of them also have a reset mechanism with which players start from the beginning albeit with a bonus to explore the underlying systems further. These create additional temporary endings and allow for another set of *narrative beats* to be introduced. Hence, idle games are not endless as such, but rather offer multiple *closed narratives* which can potentially be serialised (Theme 3).

### Idle Games as Carpentry

Idle games often also comprise a form of critical engagement, we see in line with Bogost's concept of *carpentry*, the creation of objects that *do* philosophy [6]. In four of our games, this is explicit. *Universal Paperclips* [G3] actively engages with Bostrom's argument that “[i]t also seems perfectly possible to have a superintelligence whose sole goal is something completely arbitrary, such as to manufacture as many paperclips as possible, and who would resist with all its might any attempt to alter this goal.” [9] and lets players experience how this singular focus ends up in ultimately destroying everything including the self. *Cow Clicker* [G10] is an exercise in abstracting Facebook social games to their core functionality [7], the timed click as a critique of such simplified designs serving to unethically drive player interaction. *Progress Quest* [G5] removes any player input beyond character building as a critique to contemporary role-playing games. *Spaceplan* [G9] explores space through a fundamental misunderstanding of Hawking's works on time (Themes 1 & 5).

But even when the intent is not more or less explicit, the games could be seen as *doing* philosophy implicitly. *Kittens Game* [G2] can be understood as an allegory of the presumed obsession with cats among internet users. *Tap Titans* [G7, G8], on the other hand, does what idle games more generally do: explore the complexity of an artificial game system with its own language and inner semantics. Subsequently, all idle games can be seen as an instantiation of some sort of carpentry through this structured engagement with systems. As they reinforce certain playstyles, they can also be understood as an actualised experiment into the agency of games as well as tacit engagements with background technologies.

### Implications for Play

Through idle games, play shifts from the grand experience to the everyday background activity [30]. Not only does this bear consequences for the nature of the interaction as ‘in-the-moment’, repetitive and discrete, but also means that developers design these games having everyday activities, such as riding the subway or making a sandwich, in mind as part of the playing experiences. Designers actively engage with the nature of the play being outside of their finely designed control and accept that there is a context in which their games are played which is incomprehensible to them. Acknowledging that players will leave the game regularly allows designers to consciously drive players away while simultaneously promising delayed gratification at a later time to invite them back.

### Design Guidelines for Idle Games

Our intermediate-level guidelines centre on the care designers put into the development of their games, how to develop narrative arcs in idle games, and the provision of exploratory systems. They are each followed by actionable recommendations designers of idle games might adopt into their practice along with their relevance during different stages of design.

#### Taking Care by Design

Idle games, perhaps more than other genres, are ripe for abusing players and their cognitive, financial, and temporal resources [3]. Designers need to understand how scheduling within these games can be easily used to induce addiction in

players and fuel microtransactions. Whether intentionally or not, they position their games along with the ethical ramifications that come with the potential for abuse. Conventional wisdom for commercial games suggests to design them such that players are engaged constantly, driving either a sense that the player made a good purchasing decision in buying the game or fuelling spending money on microtransactions. In contrast, idle game designers might want to aim at breaking such addiction loops to ensure that players are able to successfully disconnect from play regularly, as this is part of the enjoyment of an idle game.

Further, such games are meant to run constantly, and developers must attend to how best to minimise the impact on computational resources. In conventional games, code efficiency is a matter of optimising performance in service to presenting an experience that sits in the foreground and takes all of a player's attention. In contrast, for idle games, efficiency serves as a means to care for players and the environment. While a player is away, the game is, essentially, only *preparing* to provide an experience. This argues for developers to elevate their attention to computational efficiency in designing the systems and to pay careful attention to states when the player is present, and in need of a more interactive experience that warrants the use of resources, versus when the game idles, and can thus be less interactive.

In summary, we suggest that designers:

- *{early}* span narrative beats across larger time intervals for less addictive potential (Theme 4A),
- *{early}* design for plateaus that encourage players to disengage from the game temporarily (Theme 4A),
- *{middle}* limit the number of potential transactions within a certain time frame (Theme 4B),
- *{middle}* ensure that players have the option to play the game with a fixed cost or entirely for free (Theme 4B), and
- *{late}* reduce the energy load on players' devices and be sparse with computational cycles (Theme 4C).

### Systematic Narrative Arcs

A central component to the design of idle games is attention to their internal systems and economies. Attention to the balance of numerical rules is crucial in nearly all of game design [23]. In conventional single-player games, balancing numerical rules is in service to creating a challenging, but fun [15, 23], environment for play. In multi-player contexts, balancing a game also means curating a *fair* competitive or cooperative experience.

In idle games, this takes on a *peculiar* importance. Here, balance and economies *serve as* player experience. This contrasts with conventional games, where the mathematics are relegated to driving sequences of interactive events and determine outcomes (e.g., winning or losing). Hence, functions, rather than scripted events or game world locations, drive the process of the game's narrative. Narrative beats key off of the underlying mathematics, which are more important to storytelling than might be relevant to other genres.

In summary, we suggest that designers:

- *{early}* develop a storyline before setting the mathematical parameters of their game (Themes 2A & 3B),
- *{early}* understand implemented functions as a code-based storytelling device (Theme 2C),
- *{middle}* let narrative beats guide their mathematical functions (Theme 3A), and
- *{middle}* ensure a coherent semantic representation of variables to players, that adheres to the surrounding systematic world created by the game (Theme 3B).

#### Safe Places for Exploration

A core element of the design of idle games is how they provide spaces for playful exploration, which drives designing them as safe places. Designs are without a clear uneven outcome (e.g., winning, losing), but offer players an opportunity to manipulate systems of increasing complexity. While idle games do have goals, they profit from not being designed such that one can move into a bad state (e.g., one from which progression is not possible). Progression is always possible, but subtle changes in rates of change, punctuated by more substantial changes, rule these designs.

Idle games might allow players to experiment and make complex changes and observe their effects without damaging existing progress by enabling them to recover through time. For example, if a resource has been allocated sub-optimally, it makes for a more engaging game if it can be available in a needed quantity at a later point. User interfaces that signal the effects of changes without actually making them, such as those provided by the tool tips and Discord<sup>5</sup> channels for *Kittens* [G2], are another way to facilitate player safety.

In summary, we suggest that designers

- *{middle}* intertwine system variables to allow for different states of the games based on different player decisions (Theme 1B),
- *{middle}* allow players to disengage at any point without substantial consequences for the trajectory of the game (Theme 2B),
- *{middle}* enable players to explore different options by allowing them to allocate resources to different purposes, particularly over time (Theme 2A), and
- *{late}* offer players options to learn more about gameplay outside of the core game, e.g., by tool tips or pro-active community building (Themes 1B & 2A).

The individual guidelines are useful at different stages of the design of idle games. While they are not at a level where they offer detailed instructions, e.g. at the math of idle games [45–47], they provide a frame for designers to think with. Hence, they can be seen as strong concepts [32] on the design of idle games.

<sup>5</sup><https://discordapp.com>

## CONCLUSION

While taxonomies [2], theoretical treatises [22] and player accounts [3, 16, 19, 37] of idle games have already been of interest to the HCI community, up until now, designers' perspectives on idle games have been missing. We conducted interviews with six different designers. A thematic analysis yielded rich insights into the conceptualisation of the genre itself as well as the motivations and approaches of designers. We could extract guidelines for the design of idle games and conceptualise idle games as a form of *carpentry*, as games that *do* philosophy.

#### Beyond Games

These design guidelines are potentially valuable for other ambient technologies. We turn our attention to pervasive technologies, such as smart homes and fitness trackers, whose functions in day-to-day lives bear a striking resemblance to idle games. Our findings also have potential implications for the design of technologies around influencing and affecting the development of positive habits [54]. As designers, we might consider how, rather than building narrative arcs out of functions, that the data, themselves, forms into narrative arcs that might take on different meanings for different people [53]. Further, such systems offer, as idle games do, potentially endless interaction. They could take over the function of safe places in which humans are encouraged to interact through modes of discovery and exploration.

#### Limitations

Our work heavily focuses on indie game designers, even though we aimed for a broader spread, including more commercial designers, when contacting potential interview partners. Hence, our insights are limited when it comes to the commercial viability and economic choices entangled in the development of idle games. However, we already started engaging with the translation of our design guidelines in active idle game design, indicating an excellent fit and productive 'tool-to-think with' during all stages of design and development. Future work could also return to players' perspectives to see how well designers' intent transfers to the experience of playing the games. To this extent, we plan to develop our own game using these guidelines as a basis and test how they hold up in the minutiae of development. We also imagine a qualitative comparison to other experimental genres and their peculiarities to be a fruitful endeavour. With this paper, though, we could provide insights into the design for intricate player experiences with idle games and further lay the groundwork in getting to a working definition and understanding of the genre.

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