

# Order-Fulfillment Games: An Analysis of Games About Serving Customers

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## ABSTRACT

Consider the set of games, which we'll call *order-fulfillment games*, where the player fulfills customers' orders in a food-service setting under time pressure. We will use *BurgerTime* (1982), *Tapper* (1983), *Diner Dash* (2004), and *Overcooked* (2016) as examples. We argue that, although these games don't form a genre per se, they form a coherent taxonomic grouping defined by their core game loop, thematic elements, and typical player experiences. That these games share similarities may seem obvious, but we have found it illuminating to dig into precisely how this grouping is constituted, where its boundaries lie, and how it overlaps with well-recognized game genres. Besides analyzing this grouping for its own sake, a secondary contribution of this paper is as a case study in applying two analytical tools that have been proposed but little applied: Lessard's *high-level design pattern formations* and Sicart's version of the *core game loop*.

## CCS CONCEPTS

• **Computing methodologies** → **Ontology engineering**; • **Applied computing** → **Media arts**.

## KEYWORDS

game ontology, game genre, game loop

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## 1 INTRODUCTION

Consider the group of games whose gameplay is based around preparing and serving food and drink orders: *Tapper* (1983), *Diner Dash* (2004), and *Overcooked* (2016), to name a few. Besides being about serving food or beverages, these games have a certain abstract structure in common. The player acquires food or ingredients from a source, possibly engages in assembly steps along the way, and conveys it to the customer, all under time pressure. We show that

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these *order-fulfillment games* have much in common beyond the food-service theming, including common mechanics and common types of player experience.

Are order-fulfillment games a genre? Videogame genre is a complex concept: recognized genres such as adventure games and first-person shooters are heterogeneous in what defines them [2, 3]. It is not clear that order-fulfillment games have enough recognition as a cultural or historical grouping to qualify, or that *genre* captures with specificity the type of formal, thematic, and experiential similarity that we argue for here. A better-fitting taxonomic concept, although its theory is so far only preliminarily developed, is what Lessard [10] describes as *high-level design pattern formations*: relatively stable and recurring combinations of design elements that together form a coherent “game architecture”.

By closely analyzing existing games, this paper demonstrates how game mechanics, dynamics, and thematic elements in these games work together to create a comprehensive representation of order fulfillment in a service context. We argue that besides sharing formal elements, order-fulfillment games work to create certain types of player experiences inspired by (sometimes caricatured) aspects of the experience of preparing food and serving it to customers. After exploring the interplay between the various aspects of these games, we propose a formal description of how these games are constructed: what game mechanics go into order-fulfillment games, what constraints there are on the games' thematic elements, and what kinds of dynamics and player experiences result.

## 2 ABSTRACT MODEL

The concept of order fulfillment in a service context involves a number of participants and objects, each carrying with it commonly understood physical and behavioral characteristics. In order for a game to be understood by players as being about order fulfillment, we identify three entities that at a minimum that need to be part of the core gameplay: the customer, the server, and the service item.

A customer desires to acquire the service item, and the server provides it. This may or may not involve preparing the item first. *Service item* here is meant generically, and might be a tangible item such as a plate of food, or a more abstract service that the server provides to the customer, such as visiting a table to take the customer's order. The customer is implied to have requested the service item, and to prefer acquiring the service item in a timely manner (as is the case in most real world service encounters). From this analysis, we can see that the very concept of an order-fulfillment game entails a core game loop: a server prepares and delivers service items to a customer as fast as they can.

From this standpoint, we may ask: What is the simplest possible definition of an order-fulfillment game, even if we need to caricature



Figure 1: In *Tapper*, the player serves beer to an onslaught of thirsty customers, and collects the empty mugs after the bar patrons have finished consuming the beverage.

them a bit? A first proposal: *Order-fulfillment games are games about a player serving items repeatedly to keep countdown timers from reaching zero.*

In this proposal, timers represent the preference that customers have to acquire service items in a timely manner, and the players play the role of the server, taking actions to prepare and deliver service items to the customers. This is a characterization of order-fulfillment games in terms of their *core game loop* [15]. The loop here is one that repeatedly serves items to customers; the loop is broken with failure if the player fails to keep the repetition going fast enough, or with success if the level is completed (according to game-specific criteria such as score or time elapsed).

Any given game, of course, elaborates on this core game loop through a variety of more specific mechanics and thematic elements, such as movement, control schemes, graphical design, and so on. There are many ways to implement a timer in particular. In some order-fulfillment games (as we'll discuss), timers are represented as literal on-screen timers; in others they're the position of an on-screen character; in still others the timer might be the color of an on-screen character, the speed of music, or a thought bubble above their head. But this timer counting down and the player always trying to keep it from doing so is the core of the gameplay loop. In the game factoring language of Nelson and Mateas [13], a countdown timer for service is an abstract mechanic. Specific games will implement this abstract mechanic by choosing one of the many possible in-game representations for a timer. These choices of representation significantly impact gameplay too, but they share a common role in the core game loop precisely because they are representations of the same abstract mechanic.

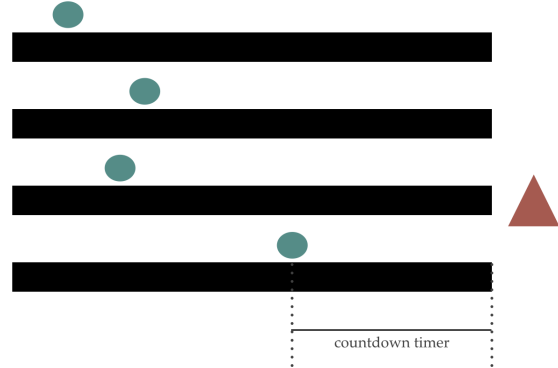


Figure 2: Diagram of the basic elements of *Tapper*, highlighting that the distance between the bar patrons (the circles), and the bartender (the triangle) is a visual way to represent the abstract mechanic of a timer counting down.

### 3 TAPPER

To illustrate how this abstract model applies to a specific game, consider the classic arcade game *Tapper*. In *Tapper*, the player controls a bartender who must pour and serve beer to an ever increasing number of customers. The layout of the game places the bartender and beer tap on one side of the screen, with customers entering from the opposite side and moving toward the bartender and his beer tap. The player fills the glasses of beer by pressing a button, and slides the filled glasses down the bar to meet the encroaching customers. When the beer reaches the customer, they drink it, are knocked back further from the bartender, and return the empty glass by sliding it back along the bar. The player is awarded points when a customer is served, and loses a life if the customers reach the bartender, or if the player fails to catch one of the empty glasses that the served customer throws back down the bar.

At first glance, one might not think of *Tapper* as a game about keeping timers from counting down to zero, since there is no explicit timer or meter. The surface presentation of the game instead involves action centered around graphical arcade-style movement. However it quickly becomes apparent that the customers' movement is not governed by graphical logics such as collision and physics, but is simply an in-world representation of the timer. The distance of the customer from the player's end of the bar is precisely the time left to serve them: Customers move steadily towards the bartender when not being served (countdown), the player loses a life when they reach the end (timer reaches zero), and there is no way for the player to physically interact with the customers except by serving them beer.

Furthermore, much of the gameplay of *Tapper* is naturally discussed using terminology more fitting to the abstract version of game as a series of timers, rather than to its specific in-game representation of those timers as physical sprite positions. As with all order-fulfillment games, we can speak of characteristic gameplay



**Figure 3:** In *Diner Dash*, the player provides table service to a diner’s patrons, juggling the various duties of a restaurant service worker.

features like the “time left” to serve a particular customer, or that we’re “running out of time” to do so.

#### 4 DINER DASH

As another example, *Diner Dash* (2004) is a computer game where the player plays the role of a server at a restaurant: seating guests, taking orders, bringing food, and clearing plates. To play the game successfully, the server must attend to several tables of customers, each in different phases of the dining experience. If a table spends too long in a particular state, such as waiting too long to place their order, they become dissatisfied, and the player is awarded fewer points for serving them. Much like being a server in the real world, playing *Diner Dash* involves good time management skills and the ability to multitask.

Like *Tapper*, *Diner Dash* can be described by the simple model. The player’s task is to keep each table of customers satisfied, and the longer the customers wait for service, the less satisfied they become. In this way, each table of customers can be viewed as a timer that the player is striving to keep full. *Diner Dash* represents satisfaction timer through icons of hearts. The more heart icons near a table of customers, the more satisfied they are.

Unlike *Tapper*, the customers in *Diner Dash* progress through a series of states. The player needs to provide an appropriate service to allow the customers to progress to the next state in the dining experience. This additional aspect of the game’s design differentiates *Diner Dash* from *Tapper*, but gameplay still centers around keeping customers satisfied under time pressure (i.e. keeping their timers, at any given stage of the progression, from running out).

#### 5 THEMATIC CONSIDERATIONS

We can get pretty far by reading order-fulfillment games through this minimal model of serving customers under the pressure of timers counting down. But our model so far doesn’t really explain

the key thematic aspect of these games: they are about serving customers. Many games have a core loop of performing actions under time pressure. But only some of them are order-fulfillment games. Why? Naturally, order-fulfillment games need to be designed in a way such that the player perceives what they are doing to be satisfying a customer demand. Furthermore, they should perceive the overall setting as a food-service one. Thus an audiovisual semiotic layer is needed in our model.

As an illustration, consider a section in the patent document filed by the developers of *Tapper*, which is initially rather surprising. The developers devote considerable space to distinguishing *Tapper* from *Space Invaders* [12]. It seems like common sense that these are two different types of games. *Space Invaders* is a shooter game, whereas in *Tapper* you serve customers beer—and don’t shoot anyone. The patent settles on a simple but surprising explanation: they differ because *Tapper* is a non-violent shooter, while *Space Invaders* is a conventional, violent shooter. This is an interesting, if unconventional, way of looking at *Tapper*.

We might ask whether the reverse is also true: Is *Space Invaders* a violent order-fulfillment game? We argue that the answer is no. The problem with treating *Space Invaders* as an order-fulfillment game is not that it is violent (one could imagine violence in an order-fulfillment setting, as we will discuss), but that the player isn’t fulfilling anyone’s orders. It isn’t an order-fulfillment game because, well, annihilating aliens with missiles is difficult to read as being a form of customer service.

For an order-fulfillment game to be understood as one, the three conceptual entities—the server, service item, and customer—must be depicted in a way that makes it reasonable for a player to interpret it as representing these roles. In *Tapper*, the player is able to interpret the game as being about serving customers beer because the visual representation of the player is identifiable as an old-timey bartender in Western attire, the beer is represented by depictions of beer mugs, and the customers are represented by images of bar patrons in the attire of the American West (in the first level, though later levels are themed differently). The entire scene furthermore takes place in a saloon-themed bar with a prominent Budweiser logo on the wall. The fact that there are several different images of customers gives further weight to the interpretation that they are meant to represent the general beer-drinking public rather than any specific set of customers. Without these cultural associations, *Tapper* would be difficult to play, understand, and culturally identify with.

We can illustrate this point with the assistance of a new order-fulfillment game that we have designed for this paper as a thought experiment. Consider the classic analog arcade game whack-a-mole. In this game, moles briefly emerge from holes in the ground, and the player is supposed to hit them with a mallet when they do. If whacking a mole counted as customer service, this would be an order-fulfillment game, but it doesn’t for much the same reason that killing aliens by delivering missiles to them doesn’t count as customer service. However, consider a simple reskin that leaves the rest of the game design formally identical. If we replace the moles with hungry faces, and the mallet with a burger, the situation is completely different. Now we have a game with the mechanics of whack-a-mole, but instead of ridding a field of moles, in the re-themed game we feed burgers to an onslaught of hungry people as



**Figure 4:** This rethemed version of whack-a-mole, *The Burger Feed*, was especially created for this paper as a thought experiment. Rather than dispatching moles with a mallet, players satisfy the hunger of customers by lowering a burger onto their face. The formal mechanics are the same as whack-a-mole, but the game has become an order-fulfillment game, whereas it wasn't previously (we claim). (For the record, this game is real, not just a mockup, and we have had people play it to see what they think.)

fast as possible. And this is indeed pretty clearly an order-fulfillment game.

We concluded earlier that *Space Invaders* is not a violent order-fulfillment game. The concept of one is not incoherent, however. Consider a game where a server is fulfilling orders through threat of force. This narrative gives the game a dark, violent backstory, but the basic thematic considerations are still met, and it would be an order-fulfillment game. One might similarly imagine a game where the customer is coerced into acquiring a service item that is harmful to them. This game would still involve the server fulfilling orders, but with a negative connotation, where the gameplay suggests that the player may want to fulfill the order as slowly as possible so as to avoid harming the customer. Or, if the server disliked the customer, they may wish to serve the customer as fast as possible. Limitless stories of this kind can be applied via narrative theming, but all of these imagined games would be order-fulfillment games.

We focus in this paper on the thematic considerations that allow a game to be read as an order-fulfillment game *at all*, as opposed to some other type of game. Once it is read as such, there are many more specific things that can be read into any individual game's way of representing and engaging with the concept of order fulfillment. In other words, once we know that a game represents order fulfillment, we can ask *what* it represents about order fulfillment. That investigation is beyond the scope of the current paper, but we can briefly survey some existing work.

*Diner Dash* has seen the most analysis that interprets its specific representation of order fulfillment. From a feminist media studies perspective, Chess [7] finds it to be a complex game with several readings in tension with one another. For example, it features an empowerment narrative where the protagonist, Flo, is a woman who quits her unfulfilling job, buys a diner, and successfully builds

her own business; but it pairs this with a time-management mechanic that frequently reproduces feminized labor, both at the level of in-game narrative, and in terms of the work-like repetitive gameplay in which the player often engages. From a different direction, Bogost [5] criticizes the game's representation of the relationship between work and success, finding it a kitsch "occupational sentimentalism" in which skill and hard work is always rewarded by a linear progression through levels. Anable [1], in a subtle and detailed analysis, integrates and develops Bogost's and Chess's readings towards a different conclusion, focusing on the game's self-awareness of its various narrative and mechanical contradictions, and their interplay with players' (often gendered) roles as both in-game worker and real-world worker.

## 6 REVISED MODEL

Moving back to a formalist level of analysis, we can take into account the thematic considerations that we've proposed and put forward a revised theory of order-fulfillment games. This model takes the form of a list of abstract mechanics and thematic constraints that make no commitment about what orders the server is fulfilling to what customers. It is thus still a minimal model in the sense that, although real games develop these factors in much more complex ways, any game needs to be readable in at least these ways to be an order-fulfillment game.

### 6.1 Formal model

Abstract mechanics:

- SERVICE\_ITEM begins in state SERVICE\_ITEM\_0 and progresses through zero or more transitions into becoming SERVICE\_ITEM\_READY-FOR-SERVICE
- SERVER takes ACTION to transition SERVICE\_ITEM through states at some rate associated with the SERVICE\_ITEM's state, and the ACTION
- SERVER has an available ACTION\_DELIVER which can be applied to SERVICE\_ITEM\_READY-FOR-SERVICE
- CUSTOMER is associated with a SATISFACTION\_METER with two poles (+/-)
- This METER moves toward dissatisfied with some EVENT
- Some example EVENT's include the passage of time, or being served a SERVICE\_ITEM which is not a SERVICE\_ITEM\_READY-FOR-SERVICE
- This METER moves toward satisfaction when SERVER performs ACTION\_DELIVER on SERVICE\_ITEM\_READY-FOR-SERVICE
- The goal of the game involves filling a CUSTOMER's SATISFACTION\_METER to satisfied
- The lose state of the game involves a CUSTOMER's SATISFACTION\_METER reaching the negative pole (dissatisfied)

Thematic constraints:

- SERVICE\_ITEM is a transferable object, or a service that a SERVER can provide
- CUSTOMER desires SERVICE\_ITEM
- SERVER and CUSTOMER are volitional agents
- SERVER must be understood as being able to provide SERVICE\_ITEM to CUSTOMER
- ACTION must be something that a SERVER can perform



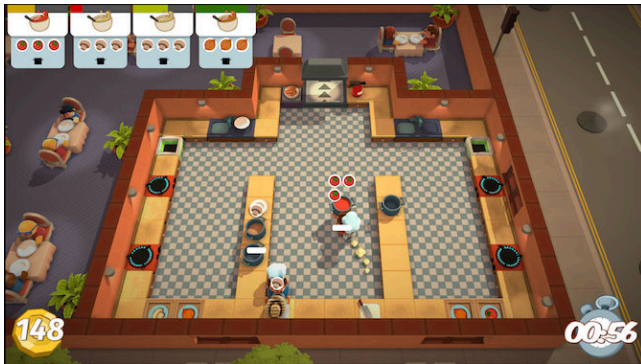


Figure 5: In *Overcooked*, players fulfill orders in a restaurant by preparing, cooking, and serving food. The customers' orders are represented by the "tickets" on the top left of the screen.

- SATISFACTION\_METER is understood as being tied to the CUSTOMER

## 7 APPLYING THE MODEL

### 7.1 *Overcooked*

*Overcooked* (2016) is a recent example of an order-fulfillment game that fits the above model. In *Overcooked*, a largely multiplayer game, players work together to run a kitchen in a restaurant. This involves receiving orders for specific foods, preparing ingredients, cooking and combining foods, sending the foods out for service, and finally cleaning the dishes.

In *Overcooked*, the server is represented by the animated representations of chefs that the players control. The customers are represented by the "tickets" that present the orders to the players (Figure 5). The customer's demand for timely service (the satisfaction meter) is represented by a mechanic where if the ticket remains unfulfilled for too long, it will begin to shake, and eventually turn red and disappear (signifying that they have canceled their order, and the satisfaction meter has reached the negative pole).

Service items are represented by the foods in various states of preparation. As the chef performs various actions, such as chopping, and carrying the foods to pots and pans for cooking, the foods progress through a series of steps. Finally, the chef plates the food, and thus the item becomes ready for service. Next, the chef carries the plate to where the undepicted servers pick up and deliver the food to the customers. At this point, the player is awarded points. If the customer is served quickly enough "tips" are awarded to signify customer satisfaction (i.e. that the satisfaction meters of the customers has reached the positive pole).

### 7.2 *BurgerTime*

In another well-known game about food preparation, *BurgerTime* (1982), players control a chef who runs across large burger components (buns, lettuce, patties, etc.), while avoiding various enemy foods (pickles, eggs, etc.) (Figure 6). When the chef runs across the entirety of a burger part, the part falls down to the next level

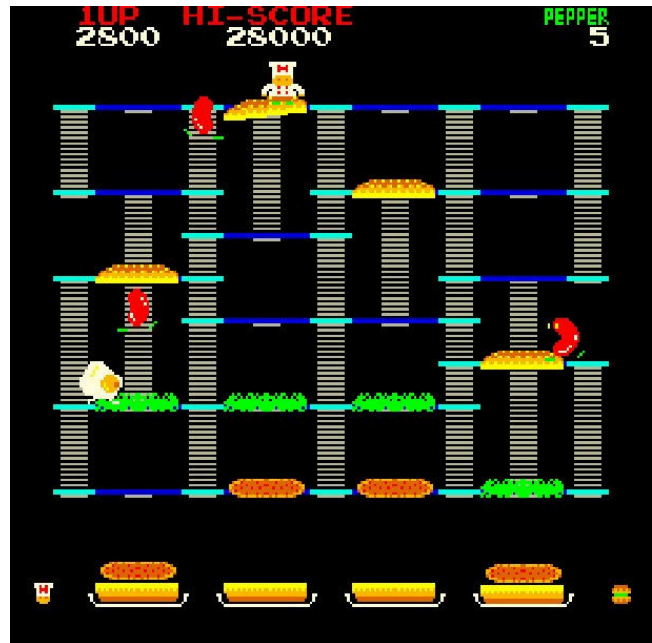


Figure 6: In *BurgerTime*, a chef runs across the top of burger components to drop them onto the plates below (see the chef on the bun at the top of the screen). The completed burgers are presumably then delivered to customers.

of platforms. At the bottom of the screen are depictions of plates, where the fully assembled burgers are eventually formed.

In many ways, *BurgerTime* is a very different kind of game than *Tapper*, *Diner Dash*, or *Overcooked*. However, it also still fits the model in many ways. The server prepares food and delivers it onto plates (presumably to serve customers). The enemies create a sense of urgency and dilemma for the player as they strive to assemble the burgers. This feature distinguishes *BurgerTime* from other order-fulfillment games in that the unseen customers are not the source of the time pressure. Players in *BurgerTime* spend much of their energy avoiding enemies rather than assembling and serving.

Comparing *BurgerTime* with the formal model shines a light on how time pressure is manifested in the game, and how this time pressure relates to what the game is purporting to represent. As a satisfaction meter is arguably not instantiated as a concrete mechanic, this suggests that *BurgerTime* is largely about being a chef, rather than being a server. In previous work, it is suggested that the antagonistic behavior of the enemy foods is an instrumental metaphor available to only expert players [17]. High-level play involves grouping and dropping the enemy foods into the burgers themselves, and consequences for colliding with the foods never occur, and instead motivate the action. Many of the experiential qualities and dynamics still manifest in *BurgerTime*, but the overall representation differs.

## 8 PLAYER EXPERIENCE

Depending on how the abstract mechanic of maintaining timers is instantiated, and the setting and narrative aspects that provide context for gameplay, order-fulfillment games can take on numerous high-level experiential qualities.

While we've put forward a reason to categorize *Tapper* and *Space Invaders* differently, it's also interesting to look at these pairings of games, where one is an order-fulfillment game and the other one isn't primarily due to the visual semiotic layer. As a result of sharing many design elements, such games share quite a bit of experiential (not only formal) commonality with their twin. *Tapper* really does feel a bit shooter-like, as the player faces an onslaught of waves of beer-seeking customers closing in and has to fend them off by slinging beers.

Similarly to the *Space Invaders / Tapper* duo, we can look at the two different whack-a-mole style games discussed earlier. The version in which the player is slapping burgers to keep down a grid of hungry faces that pop up intermittently really feels very "whack-a-mole" like, obviously by design in this game, but even in resulting player experience. So despite *Tapper* and *The Burger Feed* both nominally being nonviolent, they do still experientially position the customers as equivalent to the waves of enemies in a "violent" game, and the player as the one fending them off. Bogost [4] notes that this is particularly odd in the case of *Tapper*: bargoers are portrayed rather negatively as waves of insatiable beer-demanders, in an arcade game that was often placed in bars and featured a prominent Budweiser logo.

While order-fulfillment games often share these experiential qualities with non-order-fulfillment games that use similar mechanics, they also share many common dynamics and experiential qualities amongst themselves. Since these games involve attending to multiple tasks in realtime, gameplay often involves making difficult time management choices – namely choices about which "satisfaction meter" or countdown timer to attend to. This produces their characteristic feel of having too many and ever-increasing customer demands to fulfill, under increasing time pressure.

For example, in *Tapper*, moving to a different bar to serve a different row of customers takes time. This time comes at direct cost to the time that the player can spend serving customers at the bar where they are already standing. Thus, a common gameplay dynamic involves the player serving as many customers as possible at one row before moving to another row of customers. However, as the player serves those thirsty customers, the other customers are still moving toward the tap (if they reach it, the player loses a life). This choice involves making a trade off between moving or staying put until that row of customers is satiated. Because of this relationship between moving and time, players will often let one row of customers get dangerously close to the tap before moving while completely serving the row of customers where they are currently standing.

This tradeoff becomes what Brathwaite and Schreiber [6] identify as a dilemma in strategy games. Gameplay dilemmas involve the player choosing between two negative options, and striving to make the choice that will negatively affect them the least. Because a game of *Tapper* only ends after the player runs out of lives (while attempting to achieve a high score), all gameplay choices arguably

bring the player closer to a game over. A similar dynamic occurs in *Diner Dash* when the player is incentivized to take care of concerns spatially close to where the avatar is located before moving across the screen to attend to other duties.

These dynamics bring about the potential for a variety of emotional experiences. For example, if a *Tapper* player risks clearing a row of customers while allowing a different row to move close to the tap, and then manages to serve everyone in both rows, they can feel the pride and relief that comes from making a plan, taking a risk, and succeeding. If they fail to get to the new row in time, losing a life, they can feel regret, and other emotional pains associated with failure and the overestimation of one's abilities. Differently from games where the player avoids the attacks of enemies, order-fulfillment games arguably situate the player in a position of responsibility for their performance. This experience is the result of the theme of service. There are customers to serve, and it is the player's job to provide the service. In games like *Space Invaders*, players are avoiding the attacks of invading enemies, for which failing to avoid their attacks is arguably not perceived as being the "responsibility" of the player.

Another common dynamic in order-fulfillment games is that players may fail to properly assess the game state because they are distracted by their current task. This tunnel vision is the result of mental fatigue, and arguably, stubbornness. As an example, in *Diner Dash*, after playing for some time, players sometimes fixate on completing service for a table before seating a new set of customers. This batch approach is almost certainly not an optimal play strategy, as the tables are necessarily always in different states of dining, and waiting to clear all dirty plates at once will mean that the table with the first set of customers to complete their meal will sit idle for some time. A better strategy would be to keep all tables as active (and productive of customer satisfaction) as possible, however the cognitive load of tracking all of the states makes it very difficult to maintain that play style.

Other common experiential qualities include anxiety (when the correct choice is not clear), decisiveness (not spending the time to figure out the optimal choice), and frustration (when non-optimal choices "pile up" and eventually result in failure). Anable [1] points out that the combination of anxiety-producing time demands with an often self-referential, tongue-in-cheek aesthetic can combine to produce a feeling of zaniness, in which the player is juggling too many tasks, but in a characteristically stylized, sometimes humorous way.

## 9 CONCLUSIONS

We present a detailed analysis of order-fulfillment games, which we believe captures the sense in which games such as *Tapper* (1984), *Diner Dash* (2004), and *Overcooked* (2016) share commonalities of mechanics, theme, and player experience, despite having many other readily apparent differences. Order-fulfillment games do not precisely form a genre, but share formal similarities along the lines of what Lessard [10] describes as *high-level design pattern formations*. We argue that in order-fulfillment games, these design-pattern formations consist of a core game loop in which the player serves customer orders under the pressure of countdown timers, necessarily supported by a semiotic layer that allows these interactions to

be read specifically as, in fact, fulfilling orders. Both elements are necessary for games to be perceived as order-fulfillment games.

Besides clarifying the nature of order-fulfillment games, we hope our analysis will be useful as a step towards developing this type of formal description that is “coarser than game mechanics, but less abstract than game design patterns” [15]. Such an intermediate level of description has seen quite little concrete work so far, despite intriguing early steps. Karhulahti [9] and Lessard [10] have analyzed the heterogeneous genre of adventure games in an attempt to produce coherent sub-groupings that bear some similarities to our grouping of order-fulfillment games. Besides analyzing a quite different group of games than adventure games, we believe this paper contributes to such a theory by elaborating how to combine that line of work with an analysis that foregrounds Sicart’s game-loop analysis as a core principle, and with a group of games where the semiotic/theming aspect pays a prominent role in defining the group.

Outside of this more taxonomic or grouping-oriented line of research that we pursue, there is other research on game form and its relation to meaning that might be useful for furthering this analysis. Three examples are: research into game ontology [19], into operational logics [11, 14], and into proceduralist readings [16, 18].

More broadly, order-fulfillment games are just one of many groupings of this kind, and games may belong to more than one. Games such as *Super Mario Bros* and *Sonic the Hedgehog* are primarily about getting from point A to B, while jumping between platforms. Many role-playing games, and fantasy themed games, such as *The Legend of Zelda*, can be described as a series of “lock and key” puzzles where the player must apply abstract notions of keys to locked “doors” in order to progress through the game [8]. First-person shooters, such as *Call of Duty*, involve aiming projectiles at targets in a simulated 3d space.

Each of these groupings of games are comprised of consistent abstract mechanics and thematic constraints, and reliably manifest gameplay dynamics and experiential qualities. In our view, identifying groupings of games at this level of description that is more precise than genre could provide a useful analytical tool. For example, we might take this order-fulfillment analysis and apply it to any game with time pressure, asking, what do we learn if we look at this game as an order-fulfillment game? In some cases the results will be absurd (as with *Space Invaders* as a game about serving missiles to demanding alien customers), but in other cases this provides a particular view into the game.

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