

DEALING WITH DEATH: THE GAMIFICATION OF SOCIAL PRESCRIPTION  
IN THE HEALTH INDUSTRY

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# DEALING WITH DEATH: THE GAMIFICATION OF SOCIAL PRESCRIPTION IN THE HEALTH INDUSTRY

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## **Abstract**

Social prescribing is a way to support patients with holistic, non-clinical services aimed to improve their overall health and well-being. It is a relatively new concept, adopted in the United Kingdom, Ireland, and the Netherlands, where doctors prescribe or refer patients to non-clinical tools or activities. United Kingdom's National Health Service is implementing a pilot project that seeks to facilitate meaningful conversations between palliative care patients and their loved ones in regards to their final wishes. The tool used to facilitate conversations was a physical card game. This study documents the design and application development involved in reconstructing the card game into digital format, from wireframing to final software compilation. This research may be applied to further the digitization of social prescribing tools or the digitization of other areas of health care.

**Keywords:** gamification, health, serious gaming, social prescribing, game design, game development

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## Table of Contents

|   |     |
|---|-----|
| Author's Declaration for Electronic Submission Of A MRP ..... | ii  |
| Abstract .....  | iii |
| Acknowledgments.....  | iv  |
| Table of Contents .....                                       | v   |
| List of Figures .....   | vi  |
| Introduction.....   | 1   |
| Literature Review.....  | 2   |
| The Design Sprint Methodology .....                           | 7   |
| Discussion .....  | 15  |
| Works Cited .....   | 17  |

## List of Figures

|  |    |
|--|----|
| Figure 1: The Six Phases in a Design Sprint.....   | 7  |
| Figure 2: Golden Path for Planning Ahead.....      | 9  |
| Figure 3: Sketches of Planning Ahead.....          | 11 |
| Figure 4: Optimal Game Flow in Planning Ahead..... | 14 |

## Introduction

The concept of gamification has become ubiquitous in contexts outside of gaming and entertainment. Designers are encouraged to “gamify” applications in diverse sectors such as productivity, finance, health, education, and sustainability (Deterding et al., 2011). It remains to be seen whether adding as many gamification elements as possible into an application improves engagement and usability. It cannot be denied, however, that when used properly, gamification can have positive benefits to the user’s emotional experience, and even transform negative experiences into positive ones (Pereira et al., 2014). This is also true in the health industry, as gameful designs have been used to assess disease status, rehabilitate motor functions, and motivate patients to adhere to healthy behaviours (De Croon et al., 2018).

Social prescribing is a subsector of health services primed to utilize gamification concepts. According to a study by South et al (2008), health service resources are under increasing pressure in the U.K. The study explains that volunteer and community organizers will be the ones to supplement government services by responding to local needs and filling service gaps such as health information distribution, self-help groups, and community-based social activities. Many of these activities can be digitized and gamified to increase user engagement and emotional satisfaction. Pereira (2014) states that, through gamification, health applications can help facilitate behavioural changes through positive reinforcement and fun experiences.

Health Connections Mendip, a service provider for the National Health Service (“NHS”) in the U.K., is developing a digital card game application called *Planning Ahead*, which will be targeted towards palliative care patients and general practitioners. The application will utilize gamification concepts and apply them in a social prescribing context to facilitate important, but difficult conversations related to end of life tasks. *Planning Ahead* is currently in the alpha development stage and ready to be user-tested. This paper explores the intersection between social prescribing and gamification, documents and justifies the design and development process, and provides recommended features for future versions.

## **Literature Review**

### ***Social Prescribing and End of Life Discussions***

Social prescribing emerged as a link between clinical workers and individuals in order to refer them to services through knowledgeable community workers (South et al., 2008). Palliative care is often linked to social prescribing through compassionate communities. According to Abel et al. (2018), “compassionate communities are naturally occurring networks of support in neighbourhoods and communities, surrounding those experiencing death, dying, caregiving, loss and bereavement”. Through social prescribing, there is a direct relationship between community and clinical workers, and palliative care is no exception.

Palliative care patients endure mental stress with their impending death; in particular, end of life discussions can inflict psychological harm upon them (Wright et al., 2008). Even when the patient’s condition or prognosis is poor, clinicians, patients, and their families avoid talking about death or dying (Quill, 2000). In order to reduce the chance of causing such harm, there are ways to facilitate conversations with positive outcomes. For example, a positive outcome to a discussion could be in the form of the patient having a greater acceptance to hospice care, which would increase the effectiveness of services.

Not having end-of-life conversations can have negative outcomes. A small study by Weeks et al. (2008) demonstrated that cancer patients who preferred life-extending therapies were more overly optimistic about their chances of survival. The study implies that having a more realistic outlook on intensive therapies could reduce the aggressiveness of unnecessary medical care (Wright et al., 2008). Quill (2000) states that physicians also have a part to play in being overly optimistic as they generally do not want to relay unfavorable information related to their prognosis to their patients. He also states that these conversations happen late when the window between palliative care and death is small. Therefore, having end of life discussions earlier and more often could allow patients to make informed choices, increase the chance of receiving better palliative care, and have the opportunity to get life closure on difficult issues (Quill, 2000).



If there are benefits to these end of life conversations, why do they not happen more often? There are other factors in play aside from a lack of initiative from the patient and clinician. Patients could be moved to different clinicians in their last stage of life, thus losing the relationship they had built to support end of life discussions. (Quill, 2000). Another factor could be that having such discussions could imply admitting failure on the clinician's part to cure the disease (Keating et al., 2010). The reasons to not having these conversations sooner are regrettable and avoidable. If resources were abundant, all clinicians could be trained to facilitate conversations with palliative care patients sooner and give them a better chance to recognize their final wishes before death. The reality is that resources in health care are often scarce and end of life education should be prioritized for doctor and patient.

*Planning Ahead* is designed to fill the gap and facilitate conversations as a neutral, digital third-party mediator. Using cards as prompts, the application or “app” will help clinicians move through topics with their patients. If a professional is not available, the patient may use the app on their own or with loved ones, thus removing the need to have a clinician or other medical professional present. This would save resources and, more importantly, provide a template to move forward. In the next section, gamification concepts in the health industry will be explored to highlight opportunities, challenges, and best practices in app design and development.

### ***Gamification in Health***

Gamification is not a new concept to the health industry. The most recognizable form of gamification in health are “fitness apps”. These programs motivate users to track their exercise, monitor eating habits, and allow them to share their goals and achievements with other users. This has been a boon to encouraging better physical and mental behaviour (Wang et al., 2016). Gameful design has also been shown to lower costs and engage users by connecting socially and having achievable rewards and incentives (Lenihan, 2012). Gamification not only has benefits to the user but to health workers who may be administering the program by allowing them to collaborate more effectively and increase customer service levels (Pereira et al., 2014).

Any app may utilize gamification concepts but not all of them are serious games. Michael and Stokes defines serious games as “games that do not have entertainment, enjoyment or fun as their primary purpose” or “games that are designed to entertain players as they educate, train or change behaviour” (as cited by (Sardi et al., 2017)). Health-based apps would fall under the category of serious games as education and training are prioritized over entertainment, even if the latter is an important part of the experience. Croon et al. (2008) explains that serious games and gamified apps tap into the intrinsic motivation of players. He states that one tenet of intrinsic motivation is the self-determination perspective “where the user tries to satisfy basic human needs for autonomy, solidarity, and competence”. He defines autonomy as a person’s need to feel like they have choices and have control over them. This human need for control is what *Planning Ahead* would satisfy by putting end of life discussions into the hands of the patient. This would help them to organize their thoughts and give them a sense of autonomy when making decisions about their final wishes.

According to Bartle’s player type model, there are four major categories of players when it comes to users who engage in games: killers, achievers, socializers, and explorers (Chandross & DeCourcy, 2018). Chandross & DeCourcy (2018) explain that achievers like to complete quests and explorers prefer to locate new experiences in the game world. *Planning Ahead* is designed with these player archetypes in mind to give users a sense of pride and accomplishment in composing their wishes and exploring topics they may not have thought of. As mentioned before, end of life discussions are usually avoided by patients and clinicians; having external motivation could help engage users.

Achievements are another way to reward players for playing. They are earned by making progress, whether it be slaying monsters or collecting a certain number of coins in a level. Recognition of achievement and positive, continuous feedback is core to game success (Chandross & DeCourcy, 2018). Zichermann and Cunningham state that this achievement-reward loop stimulates dopamine in the brain, which increases the users desire to play (as cited in (Pereira et al., 2014)). In a study conducted by (Groening & Binnewies, 2019), the impact of achievements in games and results strongly suggested that achievements have the

potential to enhance performance and that this effect strengthens over time. They also concluded that a lower quantity of achievements coupled with higher difficulties raised performance. In another study involving students and badges, results showed that a quiz with achievements had a “significant positive effect on the number of questions answered” by students (Denny, 2013). He concluded that badges could be used as powerful motivators in education and integrated with little risk in other environments.

Despite the benefits of achievements in serious games, there are concerns as well. (Pereira et al., 2014) remarks that in reward driven behaviour, users may attempt to gain achievements for the sake of the achievement itself. He suggests that this approach may work for a short amount of time but is ultimately unsustainable. “Pointsification” is another term for any system that uses badges or points to represent achievement with a negative connotation. (De Croon et al., 2018) explains this by saying pointsification itself does not constitute a game; running one mile versus two or drinking a liter of water versus five are just measures of quantity. He points out that without meaningful goals, designers are just helping users understand quantities. There is temptation for developers to load as many badges and achievements as possible but in serious games, there may be the possibility of users engaging with the app improperly by having users chase points as their primary goal, instead of using them as motivation to complete their actual objective.

Card games are popular around the world, whether it be a simple game of Go Fish or, at the highest stakes, a multi-million dollar Texas Holdem tournament. (Fuchs, 2014) explains that gamification through the use of cards have been around since 1769 – Gerhard Tersteegen created a religious game that consisted of 365 cards that contained words of wisdom and advice for pious believers. By randomly selecting a card from the deck, the pious gambler would perform two activities at the same time: playing an aleatoric game of cards and practicing Christian-minded devotion. Tersteegen’s gamified prayer book was successful because of the popularity of profane lottery practice of the eighteenth century that his game appropriated and adapted for Tersteegen’s own purposes. (p. 123)

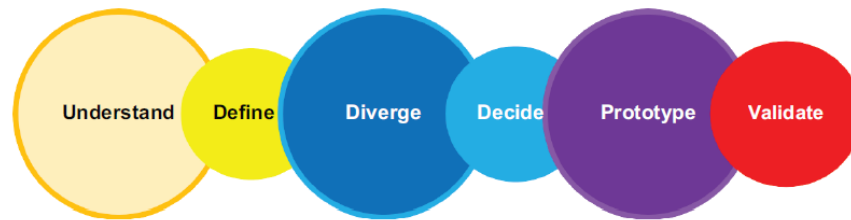
There is a certain wonder when it comes to drawing cards as there is a sense of mystery to what random card will show. Even when the subject matter may not be innately exciting or fun, users may be motivated to engage to see what the next card is. This has been demonstrated in numerous modern studies. A study by (Rastegarpour & Marashi, 2012) concluded that teacher-made instructional card games were effective tools for learning chemistry concepts. Their results demonstrated “that playing games endorsed active learning, concentration, and utilization of trial and error.” Another study involved teaching pharmacotherapeutic topics to pharmacy students through card games (Barclay et al., 2011). Results by (Barclay et al., 2011) showed that “significant increases” were seen in assessment scores as a result of incorporating educational games.

Card games can have direct physiological effects as well. In a study by Russoniello, recreational activities were found to decrease stress and improve mood in patients being treated with acute alcoholism (as cited by (Russoniello et al., 2009). His study showed that “plasma cortisol levels were lowered” and produced a “autonomic nervous system relaxation response”. This type of response is ideal for end of life discussions with palliative care patients, as they may inflict psychological harm on someone who is already stressed from dealing with a terminal illness.

*Planning Ahead* is taking the concept of a traditional card game and transposing it to digital media. There are many immediate benefits to this: cards cannot get misplaced, abundance of reliable data storage, infinite replication of game assets with nominal cost, and the integration of rich media such as sound and animation. The next section will document the design decisions taken in each step of development, from early wireframing to the final alpha version.

## The Design Sprint Methodology

(Sumual et al., 2019) defines the Design Sprint method as a creative way to problem solve when it comes to rapidly producing design solutions. He explains that there are six phases to the design sprint, as shown in Figure 1.



*Figure 1: The Six Phases in a Design Sprint*

*Planning Ahead* was developed with a modified version of the design sprint methodology in mind in order to account for the small design and development team but still adhered to its core principles.

### ***Understand***

The first stage is Understand, which is primarily about reframing statements in the form of “How Might We” or HMW questions. (Google, n.d.). Google uses this method to allow design teams to quickly take insights and pain points from users and clients and turn them around into solution-based statements. For example, a pain point for clinicians was, “It’s tough to facilitate end of life discussions with patients because I don’t know where to start.” In this case, the statement was reframed into an HMW question: “How might we make it easier for clinicians to start conversations?” Another common pain point from patients was in regards to the nature of the conversations. One statement said, “I don’t want to talk about dying.” This statement was reframed into, “How might we make topics about dying more pleasant?” The goal of the HMW exercise is not to craft perfect questions but to generate as many as possible to get a high-level view of problems that users are having, and preventing the team from arriving at premature solutions (Google, n.d.).

For *Planning Ahead*, Health Connections MENDIP provided statements from clinicians, users, and social prescribers to generate HMW questions. Below is a sample list created during the exercise:

- How might we give patients room to talk about their final wishes?
- How might we help doctors balance their work loads?
- How might we help doctors and patients have better conversations about death?
- How might we make topics about dying more pleasant?
- How might we make it easier for clinicians to start conversations?

There was a temptation to jump ahead during this phase and discuss possible solutions. The design sprint purposely breaks each step into well-defined phases in order to avoid disorganized brain storming and complete its respective objectives. In this step, forming a dozen HMW questions was enough to move on to the next step.

### ***Define Phase***

According to (Google, n.d.), the Define phase synthesizes learning in the Understand phase by “defining specific context and desired outcomes of potential solutions.” This was done by listing design principles that the potential solution would adhere to. Establishing these principles early would help design teams stay consistent during reviews and make decisions easier (Google, n.d.). As in the previous HMW exercise, the goal was to produce as many design principles as possible. The best design principles were chosen by consensus in the next step of the exercise. They could have also been chosen by a vote if a larger design team was present.

Below is a sample list of design principles and their respective explanations for *Planning Ahead*:

- Respectful: Tackles the topic of death in a serious manner.
- Simple: Easy to use without crowding the screen.
- Empathetic: Understands what palliative care patients are going through.

- Balanced: Does not overwhelm users.
- Effortless: Makes the easy things easier & the hard things possible.

The next exercise in the define phase by (Google, n.d.) is called the Golden Path. According to Google, the golden path is the optimal journey you want your user to have to find your products have real value. They explain that this path should be “easy and effortless” and “users may also come across alternate path scenarios which are all valid optional outcomes.” Figure 2 demonstrates the Golden Path for *Planning Ahead*.

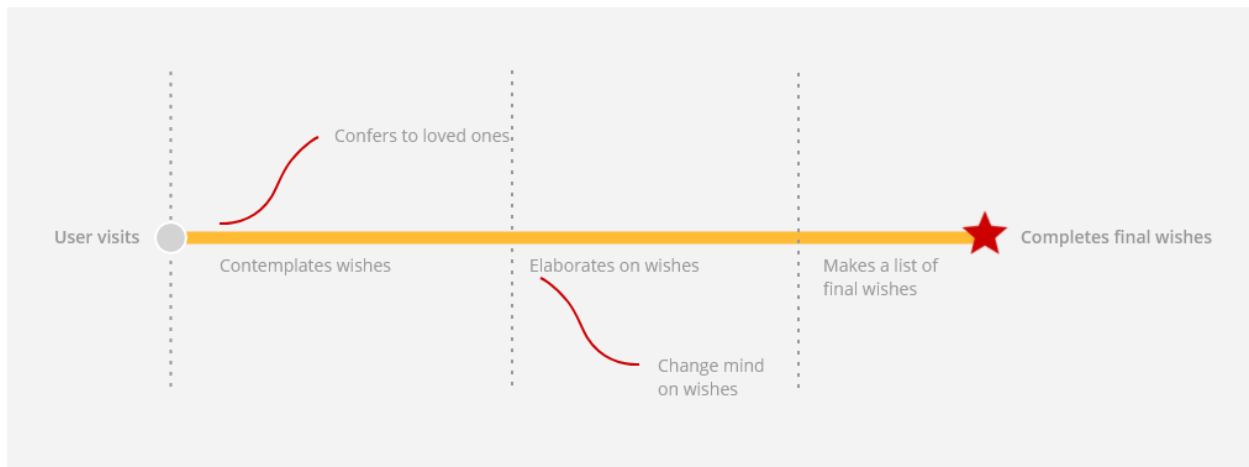


Figure 2: Golden Path for Planning Ahead

The key user journey begins when they start using the tool, whether it be a desktop download or website application. The next stage is ideation of final wishes. The user may speak to their family or caretakers in order to come to a consensus on difficult or complex wishes. The user may want to elaborate on complex or difficult wishes in detail, and make room for changes in the future. Finally, there is a pathway for the user to make a list of all the wishes they desire and have it organized in front of them. Having this path laid out made it simple to move onto the next stage: sketching.

### ***Sketching (or Diverge)***

Sketching starts by looking for inspiration in alternate spaces and generating your own ideas for consideration. After searching on the Internet, a palliative care card game named “Go Wish” by Coda Alliance was found (Figure 3). Their website describes the game as: “We know how tough end-of-life discussions are, so we created and tested a wonderful and fun sorting card game to help you easily start a comfortable conversation and choose your own way – in life, and at the end-of-life (*Go Wish – Coda Alliance*, n.d.)”. This product is a physical card game that palliative care patients can use to start conversations with predetermined questions on cards. Pricing for the cards ranged from \$26.00 to \$448.00 US dollars. Based on the images, the cards ranged in the high-quality bracket in design and print production.

A digital reproduction of Go Wish was produced by Palliative Care Australia called “Dying to Talk”. The description on the website of Dying to Talk is similar to Go Wish; the Dying to Talk cards are used to help patients talk about their wishes and preferences for your end of life care (Palliative Care Australia, n.d.). Cards are placed by dragging and dropping onto categories labeled Very Important, Somewhat Important, and Not Important. The design of the board and cards is simplistic and closely resembles a high-fidelity wireframe instead of a finished product.

The next exercise in sketching is called Crazy 8’s. (Google, n.d.) describes it as “a fast sketching exercise” to “generate a wide variety of solutions”. The sketches are meant to be quick and crude and in no way representative of a final solution. In the original exercise, eight sketches are meant to be produced but, due to limited team resources, two were produced in Lunacy. Each sketch took about ten minutes (Figure 3).



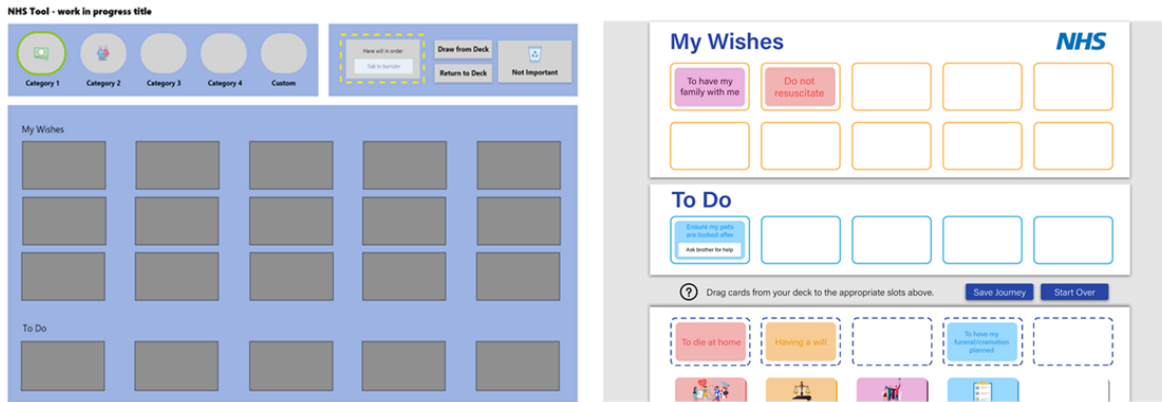


Figure 3: Sketches of Planning Ahead

## Decide

In this phase, the design sprint team finalizes the concept to be prototyped and then goes through exercises to make decisions based on sketches produced in the previous phase (Google, n.d.). Both sketches were presented to Health Connections MENDIP with mixed reactions. The sketch on the right was deemed too simplistic and similar to the Dying to Talk card game but the colour and iconography was received positively. The sketch on the left added features and new categories but lacked the color of the right. The consensus was that blending of the two concept sketches would be closer to what the solution might look like. This would be represented in the next phase, Prototype.

## Prototype

In this phase, “decisions are made around what exactly the concept is and includes” and the aim is to “create a prototype that can be real enough to be validated” (Google, n.d.). For *Planning Ahead*, this meant creating a card game using a platform that would allow users to test the concepts presented in sketches. The prototype was chosen to be built in the Unity game engine for several reasons:

1. The developer already had a knowledge base in the game engine. Therefore, there would be no new learning necessary in other programming languages and foreign integrated development environments.

2. Unity has a respectable library of free, public assets available that can be purposed for education and training.
3. It is one of the most widely used development platforms in the world with over fifty percent of games being powered by Unity (Unity, 2019).

Art assets were created in Lunacy (a UX tool), Adobe Illustrator, and Photoshop and then imported into Unity. The logic was programmed using C# which is native to Unity.

### ***Game Design Concepts in Planning Ahead***

The MDA (Mechanics, Dynamics, and Aesthetics) framework breaks a game into three distinct components: Rules, system, and fun (Hunicke et al., 2004). Hunicke continues by explaining that these components have their respective design counter-parts which are mechanics, dynamics, and aesthetics.

The rules of *Planning Ahead* are simple—cards must be drawn from each topic and dragged into slots on the board. The game is over when all the cards are drawn, all the slots are filled, or if the user decides to quit. The mechanics to facilitate the rules are as follows:

1. You can only draw one card at time from each deck. This is to prevent users from drawing too many cards without acting upon it.
2. Cards may be moved from section to section without any penalty. Should users change their mind, they are free to do so without any restrictions.
3. Cards can only be returned to the deck if put into the “Not Applicable” section. This is allowed in case users suddenly find a topic relevant to their interest and worth their consideration in the future.
4. Textboxes are enabled when cards are moved into a section. Users can input information relevant to their sections.
5. Achievements are unlocked when certain milestones are reached. Achievements are hidden until unlocked to deter users from chasing awards and taking focus away from the core objective.

6. The user may export all their wishes at any time into a printable text document to store or to pass on.

The MDA framework (Hunicke et al., 2004) breaks down aesthetics into a logical taxonomy to describe types of games listed below:

- |  |                                   |
|--|-----------------------------------|
| 1. Sensation                           | 5. Fellowship                     |
| <i>Game as pleasure sense-pleasure</i> | <i>Game as a social framework</i> |
| 2. Fantasy                             | 6. Discovery                      |
| <i>Game as make-believe</i>            | <i>Game as uncharted mystery</i>  |
| 3. Narrative                           | 7. Expression                     |
| <i>Game as drama</i>                   | <i>Game as self-discovery</i>     |
| 4. Challenge                           | 8. Submission                     |
| <i>Game as obstacle course</i>         | <i>Game as pasttime</i>           |

Starting with most emphasized, *Planning Ahead* would be classified under Expression, Discovery, and Narrative. Discussions about end of life are certainly a part of self-discovery because people want to leave their mark. Discovery and Narrative both manifest as cards are drawn and completed. Expression is encouraged through the use of textboxes and slots as users manifest their final wishes onto a digital board while being guided by categories.

Optimal game flow would look like Figure 4.

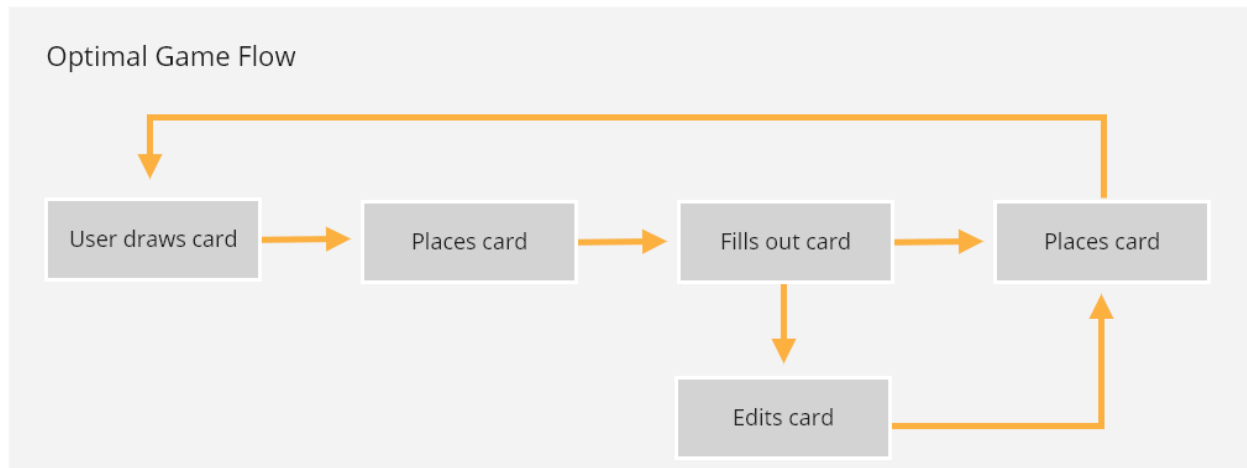


Figure 4: Optimal Game Flow in Planning Ahead

## ***Game Elements in Planning Ahead***

### ***Cards***

Health Connections MENDIP wanted five categories in the app that covers most topics palliative care patients face: Finance & Legal, Family, Personal, and Health. The fifth category is a custom deck for users to generate their own cards. Each deck has their own custom artwork and is composed of ten cards with statements that fall under their respective topics. For example, a card under the category Finance & Legal has a card that states, “I’ve Made Arrangements to Pay for Care”. Each card also has a hover tool-tip programmed in that elaborates on the title. In this case, the tool-tip displays, “I have written down my care preferences and put money aside for this, family are aware of the details and where money is saved.” These tool-tips were implemented to explain the context of the titles in case it was unclear. Each card also contains a textbox that allows for user input. Depending on where the card is placed, the user must input appropriate text that is relevant to the topic.

### ***Board***

The board is composed of three sections: My Wishes, To Do and Not Applicable. My Wishes are where cards with the user’s completed preference is placed. The To Do section is a work in progress area where cards are workshopped until they are ready to be placed into the wishes section. The Not Applicable

is a separate screen where cards are put if they are not relevant to the user. For example, if the user drew a card that was labeled, “My Pets” and the user had no pets, the card would be discarded into this section. This section is also useful for cards that users are not sure about yet.

### ***Achievements***

Achievements are unlocked when certain actions are performed. There are six achievements in total that symbolize milestones to encourage users to keep drawing and filling out cards. Completing them is optional and there are no consequences from not unlocking any.

### ***Options***

Buttons on each side of the game represent various actions that may be taken during play. The types of buttons are listed below:

- Sound: Toggles the sound on and off.
- Help: Triggers the help modal with instructions on how to play the game.
- Print: Exports current wishes on board to a text file to print or store.
- Reset: Resets the game by putting all cards back into deck and clearing all slots.
- Save Progress: Saves the current session with card positions and text.
- Exit: Quits the game.

### **Discussion**

Opportunities abound when it comes to gamifying options in applications which can be a double-edged sword. Due to gamification being so ubiquitous, concepts like achievements and badges can be implemented with little risk as users have become normalized through experience. Developers can easily be tempted to load their applications with as many gamified concepts as possible, causing players to recognize reward patterns and disassociate themselves with the actual content.

*Planning Ahead* tried to avoid this problem by being subtle with gamification and allowing the users to narrate their own conversations without interference. The card game mechanics serve as a guide to having productive conversations and the achievements are encouragements as a reminder for the user to continue being productive. Discussions about having levels that users could gain were considered but ultimately shelved for this version.

Without a full validation cycle, there is no opportunity to elaborate on results from user testing. This would have been helpful in measuring efficacy of applied gamification concepts in *Planning Ahead*. Other considerations such as the optimal number of slots, cards, or decks could be determined with enough feedback. Although it is regrettable that for the scope of this phase that validation could not be completed, it should be easy to accomplish with cooperation from Health Connections MENDIP in accessing patients and general practitioners. The intersection between social prescribing, especially in end of life discussions, and gamification is still relatively unexplored which makes it an exciting, albeit murky space to be in.

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