

## ESTEAM

### **A Team-Building Application to Increase Medication Adherence**

SI 684 - Professor Klasnja

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Link to Prototype: <http://invis.io/YK2PF0G8H>

Link to Video: <https://youtu.be/ngINgZ1Emqo>

## **Problem Statement**

Chronic illness in the U.S. is becoming more prevalent each year as people live longer. Many of these diseases are treated through pharmacotherapy. The World Health Organization expects 157 million Americans to have at least one chronic disease with required medication by 2020. However, medication adherence is a major issue among chronic disease patients. Only about 50% of people who are prescribed medicine take the medication as prescribed (Brown & Bussell, 2011). Medication non-adherence is any situation where a patient does not take a prescription as directed. This includes taking too much or too little of a medicine, wrong doses, and incorrect timing. The most significant problem seen is non-use of the prescribed medication. After six months of beginning a medication, adherence rates drop significantly with 20%-30% prescriptions never being filled (CDC, 2013). For patients, non-adherence can have severe outcomes. Overall, approximately 25%-50% of treatment failures and 33%-69% of hospitalization related to medication are attributed to non-adherence (Brown & Bussell, 2011; Osterberg & Blaschke, 2005). In addition, ~125,000 deaths are caused by non-adherence annually (CDC, 2013). Specific diseases carry their own risks when patients do not adhere to necessary medication. Economically, non-adherence costs the U.S. healthcare system between \$100 and \$289 billion per year (CDC, 2013). For individual patients, they cost themselves \$2000 in annual physician appointments (CDC, 2013). Medication adherence is costly personally, socially, and monetarily. Consequently, efforts toward better adherence are needed.

One disease for which there is a need of better medication adherence is depression. Depression is one of the most common diseases worldwide. According the World Health Organization (WHO), approximately 350 million people suffer from depression (“WHO | Depression,” 2015). The U.S. alone carries a major burden. In 2012, 6.9% (~16 million) of U.S. adults had at least one major depressive episode (“NIMH · Major Depression Among Adults,” n.d.). The most severely depressed patients can end up committing suicide. An estimated 1 million deaths each year are attributed to suicide (“WHO | Depression,” 2015). On the less severe end of depression, the disease can cause changes in diet, sleep habits, and school, work, and home life for those afflicted. Treatment for depression often includes prescribed anti-depressants as well as psychotherapy. Medications often take 4-6 weeks before the full effects are seen (“NIMH · Depression,” n.d.). In addition, medications may have to change frequently in the beginning of treatment in order to find one that is effective. Medication adherence for people with this illness is very low. While adherence drops to 50% in six months for patients with any disease, as mentioned above, adherence in patients with depression drops to 50% in only three months (Osterberg & Blaschke, 2005). The prevalence of the depression within the U.S. and worldwide, the importance of medication for treatment of the illness, and the significant lack of adherence to antidepressants presents an important problem that needs to be addressed.

## **Solution Overview**

There are a multitude of reasons why people do not adhere to their medications. The main factors, from Osterberg & Blaschke (2005), which our product, ESTEAM, will attempt to address are “side effects of medication,” “patient’s lack of belief in benefit of treatment,” “patient’s lack of insight into the illness.” As has been shown through previous interventions, improvement for medication adherence in depression patients requires a multi-pronged approach, including education, cognitive-support, and reinforcement (Osterberg & Blaschke, 2005). Consequently, ESTEAM will also provide tools through which patients can be reminded of and keep track of their medications and tools through which they will receive support for their depression.

Initially, when the problem of medication adherence was recognized as an area for intervention, we decided to design the product for a broad audience because adherence is an issue for most chronic disease medications. We focused on older patients, who generally suffer from more chronic diseases and hence would have more medications to which they need to adhere. However, we were not limiting the product to only the older adult population. If younger patients found the product useful, they would have been welcome to use it. Through our first Lo-Fi prototype designs, we realized that our scope was not narrow enough. By trying to address patients with any disease, the website suffered in its potential effectiveness with too many features that would confuse users. Therefore, we decided to narrow our target population to depression patients, a large population whose issues could be grouped into well-defined categories that we felt could be addressed by the features and purpose of our product.

We designed a social website, with multiple resources, for depression patients who have trouble with medication adherence. Our solution is rooted in the fact that social networks are powerful tools to help elicit positive feelings towards our goal behavior change of medication adherence. We also try to induce intrinsic motivation to take medication by trying to relate overall life purpose and values with adherence goals. We do this by cultivating a small homogeneous network of people who share values, age-range, and gender who all struggle with depression. Just being apart of this network will increase cognitive support, self-efficacy towards talking about medication problems, and sense of belonging. These positive effects will hopefully translate towards how they indirectly think about their medication, and in the end will elicit positive feelings towards medication adherence--one of the biggest obstacles of medication adherence (Osterberg & Blaschke, 2005).

## **Justification for selected onboarding features**

### *Choosing an avatar*

We wanted to ensure that users feel their information is confidential. We therefore have them choose an avatar to represent themselves in order to help maintain anonymity.

### *Drug List Confirmation*

Since this website is connected to a patient's Electronic Medical Record, their medications will already be listed on the setup page. This page serves the purpose of confirming that the medications on file are up to date and correct.

### *Stages of Change Questions*

We wanted the group composition to be a heterogenous mix of people at various stages of change, in alignment with the Transtheoretical Model<sup>1</sup>. A mixed group at different phases will help motivate those at the lower stages of change to advance to higher stages of change (Gold, 2008). And those at higher stages of change will feel motivated to continue adherence behavior since people are looking to them as a role model (Gold, 2008). We select people from the maintenance stage of change to be official group mentors for 8 other peers.

### **Stories**

User generated “stories” are a large portion of our website. Users will be able to post stories to this section via a “post” button located in the upper right hand corner of the stories section. This posting feature allows text, picture, and video content to be posted. At the top of the stories page a large carousel will cycle through several stories which will be curated by our staff with an emphasis on stories of individuals which have benefited from taking their medication, are living more fulfilling lives as a result of their medication, and those that highlight individuals overcoming the emotional or cognitive barriers related to medication adherence. Stories in the main feed underneath the carousel will be the top rated user stories. Users will be able to rate stories on a scale from one to five, flag inappropriate content for our staff to review, or leave a comment at the end of stories.

Not all stories from users will be specifically about medication or depression. Although we considered filtering stories to only address depression and medication adherence, we decided that it was important for user-generated content to encourage participation by drawing members in with stories they are naturally interested in reading. However, the overall goal of the stories section would be to increase the positive subjective norms related to medication adherence, increase behavioral intent to take medication, and subsequently increase medication adherence behavior in accordance with the Theory of Planned Behavior (Montano & Kasprzyk, 2008).

Robert Cialdini (2003) labels people’s perceptions of what behaviors are usually performed by others as “descriptive norms” and perceptions of what behaviors are approved or disapproved of by others as “injunctive norms.” Individuals with depression may not have a clear understanding of how others with depression act with regard to medication adherence because of the perceived stigma of discussing depression or psychoactive medications publically. By showing

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<sup>1</sup> Actual questions used to assess stage of change is taken from a validated survey on postmenopausal osteoporosis performed by Deborah Gold.

users stories that demonstrate that many individuals are taking their medications (and experiencing positive effects) and that many individuals believe that people with depression should take medication as an option for treating depression, we will be positively impacting the user's descriptive and injunctive norms related to medications use. Influencing individuals' beliefs that others in their referent peer group not only perform an action but approve of it has been shown to be a powerful motivator in behavior change (Cialdini, 2003).

Social Cognitive Theory indicates that when individuals are exposed to others modeling a behavior that leads to a desired outcome, they are both more motivated to engage in that behavior and capable of acting in accordance with it (McAlister, Perry, & Parcel, 2008). Thus, by reading stories about how other, similar individuals overcame difficulties related to taking medication, people using this website will be able to follow the behavioral patterns necessary to successfully take their medication (Baumer, Katz, & Freeman, 2012). In addition, these success stories from other individuals suffering from depression may increase the self-efficacy of members to adhere to their medication by affecting their perceived behavioral control (McAlister et al., 2008).

Theories of social networking and social support have found that emotional and informational support can positively affect health outcomes (Heaney & Israel, 2008). The stories on our website form a node in which members will be able to benefit from informational support expressed in the advice, suggestions, and information from stories related to medication adherence or depression, and emotional support through the positive comments generated in response to user-written stories.

## **Doc Blog**

The physician blog will be accessible from our home screen. Within the physician blog, the layout will be identical to that of the "stories" section of the website. However, members on the site will be able to submit questions directly to physicians by clicking on a question submission button located in the upper right hand corner of the screen. Articles on this page will be created by our staff of physicians in response to these questions and popular themes which surface in the "stories" section and the discussion board.

We considered generating articles in this section based solely on what we believed were important topics for site members. However, we felt that it is important to give users a sense of agency in determining the type of information which is provided to them. We believe that this will help to empower users with informational support and increase their self-efficacy in their ability to adhere to their medication. It may also have the benefit of normalizing behavior (Cialdini, 2003) by showing members that other individuals in their group have the same questions and concerns which they do. Adding a panel of physicians also helps to clarify disputes related to medications and depression which may arise in the forums and legitimize the website as a medical tool for users.

## **Talk/Ask a Health Professional**

From the home screen members can click on “talk now” and choose to chat with a health professional. When they enter this section of the website, they will be able to choose from two options: “message a health coach” and “in crisis.” These options allow us to effectively triage individuals which may be suicidal and require immediate attention and those that simply want to discuss an issue about their medication with a health coach.

If the user selects “message a health coach” when they land on this screen, they will enter into a chat dialog with a health coach and will be able to ask any question they may have in real time. Under the “in crisis” button they will be given the option of either participating in a video chat or a text chat with a health coach who is trained in suicide prevention counseling. The suicide prevention feature is provided to give users immediate help when they need it the most. The regular communication with a health coach is provided so that members can get immediate emotional, informational, and appraisal support (Heaney & Israel, 2008) from a trustworthy source with the authority of a trained medical professional (although not necessarily a physician).

While we considered having a prominent “suicide prevention” button as the entry link to this section on the homepage, we abandoned this idea because we were afraid of unintentionally priming depressed users with thoughts of suicide by providing this constant reminder in a central location of the site. Studies have shown that slight environmental cues in real (Papies & Hamstra, 2010) or digital environments (Consolvo et al., 2008) can lead to large changes in behaviors. Accordingly, the suicide prevention feature is quickly accessible, but in a less pervasively salient portion of the website.

## **Values/purpose:**

The first box on the top left screen of the home screen is the “values/purpose” section. During onboarding, users will choose and rank five personal values to match them into homogeneous groups. These values come from the Rokeach Value Survey, which consists a list of 18 instrumental values used in social psychology to classify values. In addition to values, users will also be prompted to state a purpose. Research conducted by Kim, Strecher & Ryff (2014) has demonstrated that having a robust purpose in life is linked with better mental and physical health even among depressed populations. As the user identifies their purpose and is able to subconsciously link their purpose with medication adherence, they are more likely to have positive feelings towards taking their medication. A user’s purpose will be in the top right corner of the home screen as a self-regulation tool: as the central page of the site it will serve as regular reminder of their purpose next to their weekly medication adherence progress, we hope to elicit an implicit association where positive attitudes associated with their purpose will also be associated with medication adherence (Consolvo, et al, 2008; Sheeran, et al, 2013).

We recognize that during the onboarding process, it might be overwhelming to think of a purpose on the spot. For this reason, we allow the user to skip this step, and as a placeholder in that spot, the person’s top five personal values will be listed. While this does not have as much support

from the literature as a strong association between health behaviors and personal values, we still hope to prompt an implicit association between positive personal values and medication adherence.

### **Friends on right tab side-bar**

The pervasive friends list is located as a sidebar feature, and will be present on every page of our website. We wanted to feature friends throughout the website since the purpose of this website is to establish a community that supplies emotional and cognitive support to ultimately improve medication adherence. Furthermore, consistent exposure to this feature can help remind the user of their support system, and increase cognitive support--or the expected support people will receive if needed (Schwarzer & Leppin, 1991).

The user's friends list is made up of nine other users who share similar values and are similar in age and gender. These groups are intentionally structured to be small enough to facilitate strong ties but large enough to have a feeling of group security. According to Schwarzer & Leppin (1991), these features of size and group composition are advantageous for "maintaining identity and indirectly for well-being and health." Ideally we want this group to be integrated into a user's daily life, just as medication adherence should be.

By having friends that the user can relate to, he/she can benefit from social modeling: by realizing other people similar to them share the same apprehensions, users can feel more comfortable asking questions and feel motivated to partake in healthy medication behaviors when the rest of the group does (McAlister, Perry & Parcel, 2008). This social support system can provide emotional support, informational support, and appraisal support (pg. 190, Heaney & Israel, 2008). In other words, these three kinds of support will provide empathy, usable advice, and affirmations--all necessary provisions that can help increase self-efficacy and positive emotions towards medication adherence (Heaney & Israel, 2008).

Lastly, according to the Theory of Reasoned Action, one of the most influential ways this social network can increase positive emotions towards medication adherence is by changing the user's subjective norms. A person's subjective norm is the assessment of whether people who the individual are close to approve of a behavior and how that shapes the individual's motivation to perform that particular behavior (Montaño & Kasprzyk, 2008). Therefore, the creation of a positive, supportive social network is a critical component towards influencing subjective norms about medication adherence.

### **Peer Mentor**

In addition to the support provided by the group which members are assigned to, there is also a peer mentor on our website which provides the user with emotional and cognitive support. The peer mentor is an individual who has been screened through the onboarding process and answered questions indicating that he or she is in the "maintenance stage" of the Transtheoretical Model (Prochaska & DiClemente, 1994). Once this individual is identified, our company would contact him to determine if he would be willing to be designated as a "peer mentor" for his group.

Individuals agreeing to be peer mentors would stand out from other group members on the website's interface by having profile pictures with a bolded border and the title "peer mentor." Other members of their group can then contact them for questions related to medication adherence, benefits of taking their medication, and emotional support by clicking on their avatar and sending a message to their inbox.

Research has provided evidence that peer mentoring interventions which pair individuals with mentors who have previously experienced the same medical or psychological condition can lead to improved health behavior outcomes (Long, 2012; Sandhu et al., 2013; The Ontario HIV Treatment Network, 2014; Webel, Okonsky, Trompeta, & Holzemer, 2010). This mentoring can be particularly effective when individuals are paired according to similar characteristics between those providing and receiving mentorship (The Ontario HIV Treatment Network, 2014). The benefits of this relationship goes both ways, with mentors often further internalizing the behaviors that they are advocating for in others (The Ontario HIV Treatment Network, 2014), helping mentors to stay in the "maintenance" stage of the Transtheoretical Model.

We considered including both the health coach and the peer mentor on the home screen of our website. However, we decided to place the health coach within a submenu nested under the button "talk" to encourage members to use their peer mentor as their first option for questions or concerns. Our choice architecture purposefully encourages interaction with mentors as a hub of communication by making the mentor's photo stand out from the rest of the members of the group with a bolded outline, thus inviting members to interact with him or her. Users are able to work with the peer mentors to decrease their stress related to medication adherence with the cognitive support they provide. Cognitive support has been shown in meta-analysis of over 400 studies to be positively correlated with better health outcomes (Schwarzer & Leppin, 1991).

## **Group Discussion**

To form stronger relationships with the user's group of friends, the home page displays a running feed consisting of a group discussion. The forum will generate a new "topic of the day" each day to spark a conversation. However, these forums are not controlled, and members are allowed to veer off from the topic of the day. Essentially, this is a place for the group to talk about anything they wish to discuss--whether it has to do with medication issues, stress levels, shared interests, or even the weather--they are free to discuss anything that will help grow the community<sup>2</sup>. The point of this feature is to have open-ended social awareness, allowing the users to define what counts as important to help them (Baumer, et al. 2012). This way natural positive feelings towards each other and the behavior of medication adherence can genuinely transpire. This place is also a way to exchange appraisal support, or constructive feedback and affirmation about one's behaviors to help increase self-efficacy (Heaney & Israel, 2008).

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<sup>2</sup> Group discussions will be screened to ensure the environments are kept relatively positive, and no bullying or negative comments will be tolerated.

## **Log**

As a way to monitor users' progresses, ESTEAM will prompt users with two simple questions daily to assess their medication adherence and mood. The goal of integrating these two questions is to help the users self-monitor their own progress in becoming more adherent in taking their medication.

The first questions, "Have I taken my meds?" will be used to help ESTEAM users self-monitor by helping them recognize and record their target behavior of taking their correct dosage of medication on time (Korotitsch & Nelson-Gray, 1999). Users will answer the first question by checking boxes with 'yes' and 'no' answers. The second question, "How I feel today", will be presented with a drop-down menu of five different choices that range from 'very sad' to 'very happy'. Collected metrics on the user's mood will be used to demonstrate trends in a user's medication adherence and the effects it has on the user's mood.

By integrating these elements of design, we aim to empower ESTEAM users to self-monitor their adherence progress. In empowering the users to self-monitor, we hope to elicit reactivity amongst our users (Rachlin, 1977). Based off the studies conducted by Korotitsch et al., 1999), we hypothesize that the reactivity will have an effect on our users by helping them move towards the therapeutically desired direction (increasing medication adherence). In essence, by enabling ESTEAM users to self-regulate will invoke reactivity that will lead to the users to self-regulate their behavior in order to increase their medication adherence.

## **Circle of Progress**

A functional circular progress bar, which circulates a picture reminding users of their purposes, will be integrated to the home dashboard. The circular progress bar will help users recognize their pattern of medication adherence and mood patterns. The user will have the choice to have the circular progress bar display their usage pattern from the previous week, month or year. Furthermore, the Circle of progress will include goal-setting functions.

We chose to integrate a circle of progress to the home dashboard screen as to provide feedback so to enable our users to self-monitor. Similarly, the pervasive nature of the circular progress bar will serve as a reminder for ESTEAM users to continue adhering to their medication regimen. Research by Bargh, Gollwitzer and Oettingen (2010) has demonstrated that mental representation of goals, in this case, medication adherence, "can be activated without the individual knowing about or intending it – either through subliminal presentation of goal-relevant stimuli or through subtle and unobtrusive supraliminal presentation." As a result, we hypothesize that ESTEAM users will be gradually primed to think about their medication adherence whenever they are exposed to the Circle of progress.

The circular progress bar will progress around the image of the user's purpose as the user continues to utilize self-monitoring functions. The decision to present the progress bar in a circular form was a design decision that would hypothetically drive the user to complete the tasks necessary in order to 'close the circle' – in this case, to continue self-monitoring their medication

adherence. According to the Law of Closure, Fisher and Smith-Gratto (1998-1999) proposed, “open shapes make the individual perceive that the visual is incomplete. The sense of incompleteness serves as a distraction to the learner.” As a result, “The learner will then mentally do what is necessary to complete the visual.” While this may simply alter the user’s visual perception of the circular progress bar, we believe that integrating goal-setting functions with the circle of progress will create feelings of pursuit to completing the circle by attaining the set goals. We expect that this will drive users to subconsciously wanting to complete the goal without even implicitly setting that goal.

### **Future Ideas**

While this application exists within the ecosystem of the personal health record (PHR), our current iteration does not fully engage with the possibilities of integrating information gained from this site with information gathered during medical visits and vice versa. In future versions of our platform, our site could take advantage of this connection, giving physicians access to updates on depressed patients (with their consent) and integrating members’ physicians into forums. Finally, a randomized control trial of this intervention with depressed patients could help to validate its efficacy. In-depth semi-structured interviews with users after these randomized trials could also help determine which features of the website to keep and which should be modified or discarded.

**Link to Functional Digital Prototype:** <http://invis.io/YK2PF0G8H>

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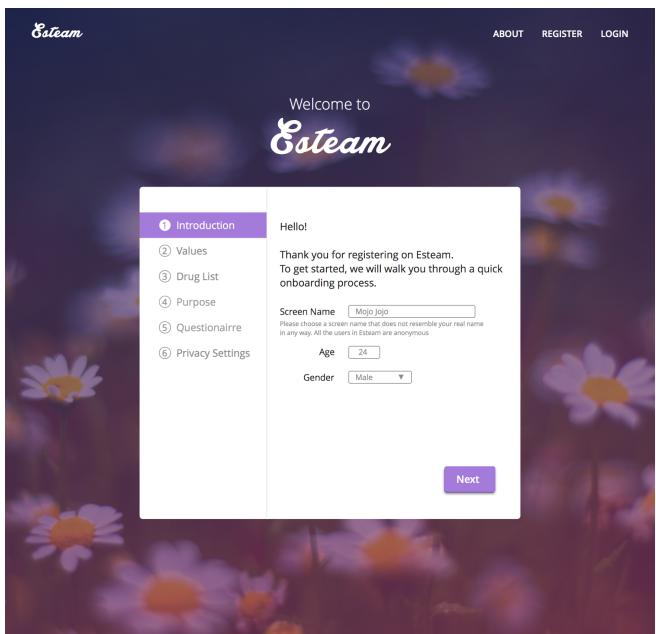
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## Appendix A. Onboarding Screens



Welcome to **Esteam**

**① Introduction**

Hello!

Thank you for registering on Esteam. To get started, we will walk you through a quick onboarding process.

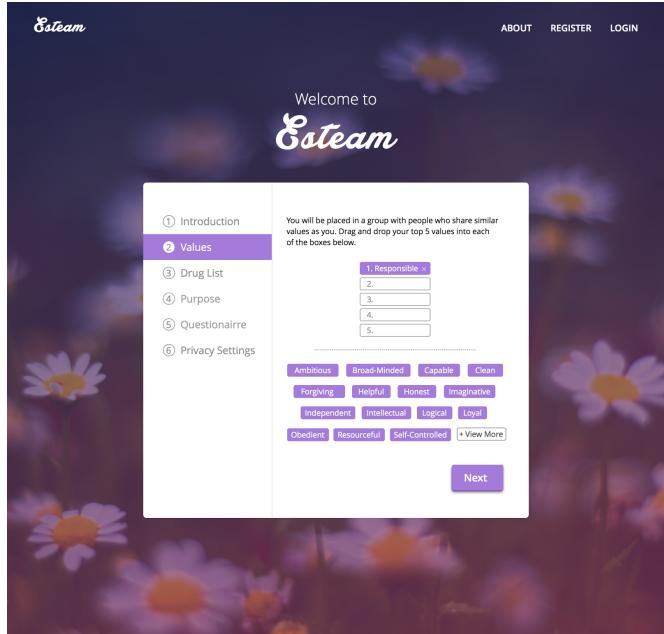
**Screen Name**: Maji Jojo  
Please choose a screen name that does not resemble your real name in any way. All the users in Esteam are anonymous.

**Age**: 26

**Gender**: Male

**Next**

**ABOUT REGISTER LOGIN**



Welcome to **Esteam**

**② Values**

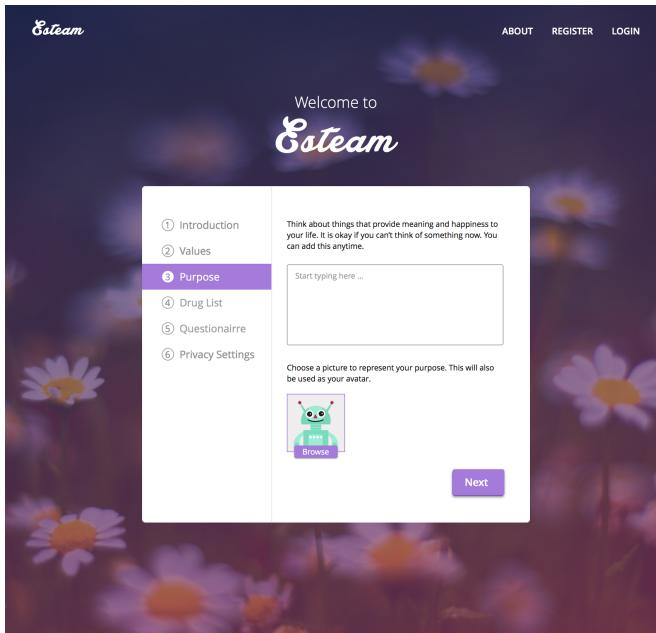
You will be placed in a group with people who share similar values as you. Drag and drop your top 5 values into each of the boxes below.

1. Responsible  
 2.  
 3.  
 4.  
 5.

Ambitious, Broad-Minded, Capable, Clean, Forgiving, Helpful, Honest, Imaginative, Independent, Intellectual, Logical, Loyal, Obedient, Resourceful, Self-Controlled, + View More

**Next**

**ABOUT REGISTER LOGIN**



Welcome to **Esteam**

**③ Purpose**

Think about things that provide meaning and happiness to your life. It is okay if you can't think of something now. You can add this anytime.

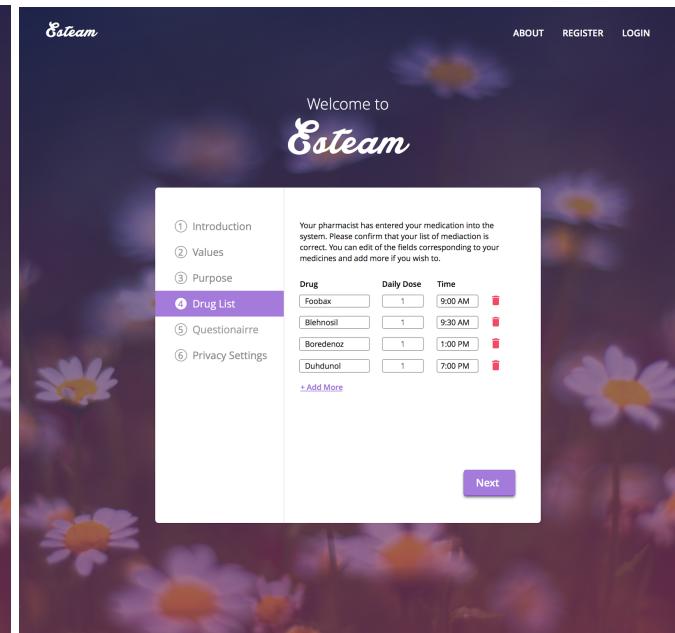
Start typing here ...

Choose a picture to represent your purpose. This will also be used as your avatar.

 Browse

**Next**

**ABOUT REGISTER LOGIN**



Welcome to **Esteam**

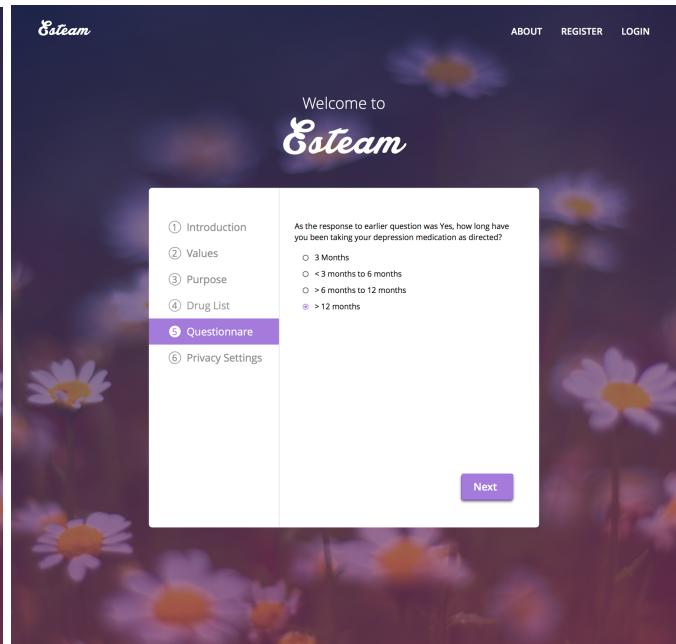
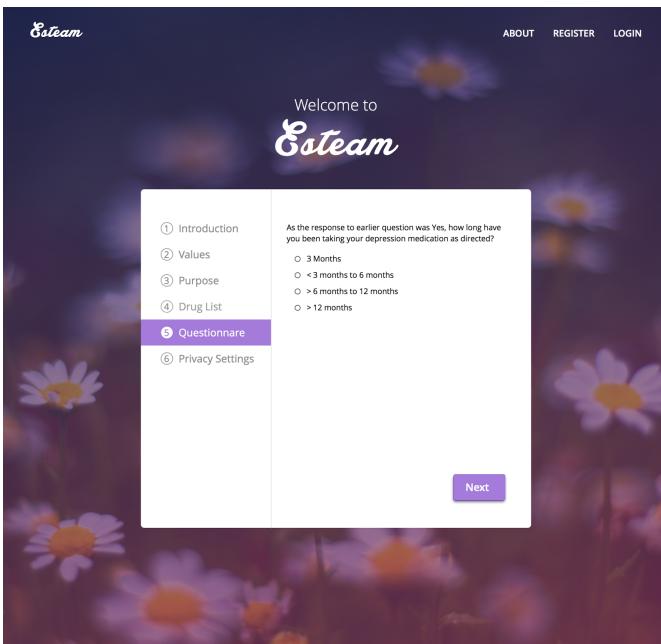
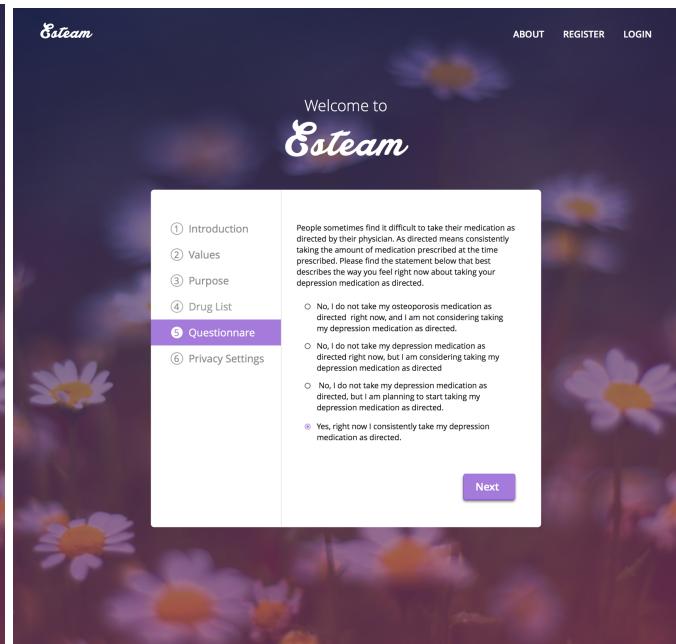
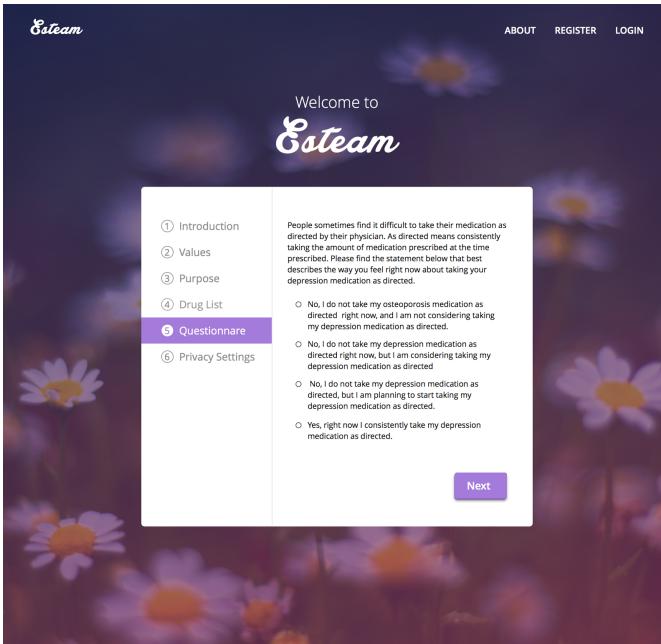
Your pharmacist has entered your medication into the system. Please confirm that your list of medication is correct. You can edit the fields corresponding to your medicines and add more if you wish to.

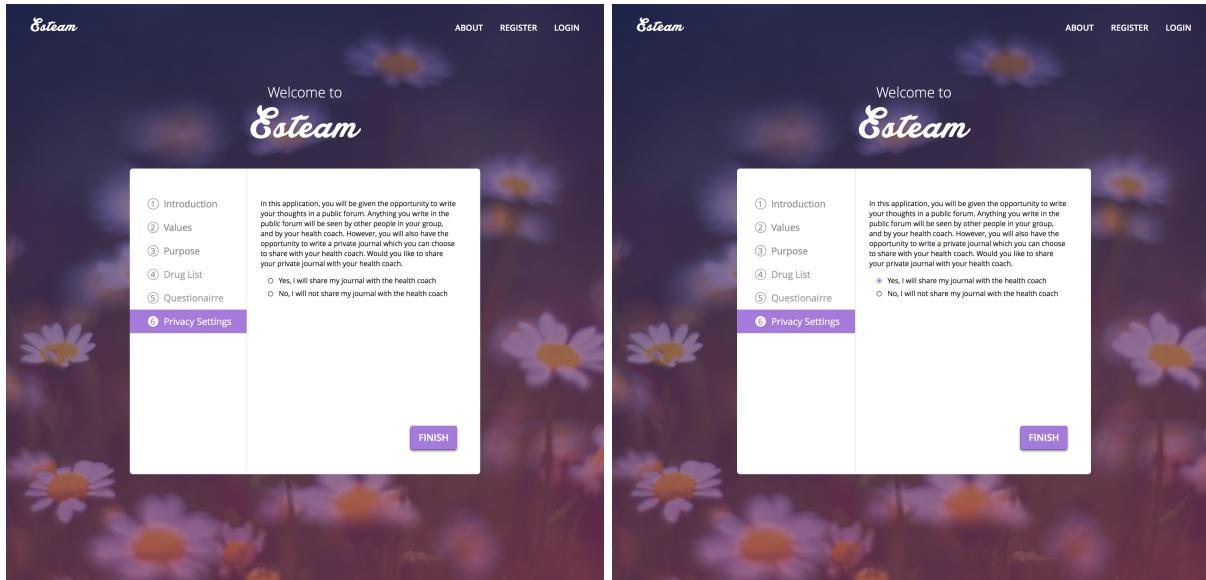
Drug	Daily Dose	Time
Foobox	1	9:00 AM
Biehnosi	1	9:30 AM
Boredenoz	1	1:00 PM
Duhdunol	1	7:00 PM

+ Add More

**Next**

**ABOUT REGISTER LOGIN**





## Appendix B. Home Screen

### Featured Discussion

Do hobbits adhere to medication? What can we learn from their medication habits and ever happy lives?

By Ned Stark · 1hr ago · 7 Responses

[Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor labore et dolore magna aliqua. Ut enim ad minim veniam quis ... Read More](#)

By Bilbo Baggins · 2 Upvotes · Upvote

[Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum beatae vitae dicta sunt explicabo ... Read More](#)

By Jeff Beck · 2 Upvotes · Upvote

[View 5 more responses](#)

### Other Discussions

At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis pras voluptatum deleniti atque corrupti quos dolores et quas .

By Ginny Weasley · 1hr ago · 7 Responses

At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis pras voluptatum deleniti atque corrupti quos dolores et quas .

By Ned Stark · 1hr ago · 7 Responses

At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis pras voluptatum deleniti atque corrupti quos dolores et quas .

### Your Esteem Team



Han Solo  
Online



Bilbo Baggins  
Online



Susan Pevensie  
Offline



Leia Organa  
Online



Jeff Beck  
Offline



Ginny Weasley  
Offline



Ned Stark  
Online



Claire Underwood  
Online

The screenshot shows the Esteam interface. At the top, there's a banner with the text "A moment out of our busy lives." by Nick Fury. Below the banner, the navigation bar includes links for HOME, STORIES, DOC BLOG, and INBOX. A notification icon for "Mojo" is also present. The main content area has a dark background with a blurred image of people. On the left, a sidebar titled "Stories" lists several story cards:

- Music to my ears** by Bruce Wayne (Now) - 35 likes, 6 comments
- In search of happiness** by Jeff Beck (2h ago)
- Battle with side effects** by Ned Stark (Yesterday) - 26 likes, 15 comments
- A day in their shoes** by Bilbo Baggins (2 days ago) - 64 likes, 3 comments
- Story of my life** by R2D2 (March 31, 2015) - 28 likes, 14 comments
- Few right reasons** by Aquaman (March 29, 2015) - 17 likes, 2 comments

A modal window for "Han Solo" is open, displaying a small profile picture of a green robot, the name "Han Solo", and the description "Capable, Responsible, Honest, Courageous". It also states that Han Solo told 6 stories so far, with a link to "View all". Below the modal are two buttons: "MESSAGE" and "PROFILE".

To the right, a sidebar titled "Your Esteam Team" lists team members with their status (Online or Offline) and profile icons:

- Han Solo (Online, MENTOR)
- Bilbo Baggins (Online)
- Susan Pevensie (Offline)
- Leia Organa (Online)
- Jeff Beck (Offline)
- Ginny Weasley (Offline)
- Ned Stark (Online)
- Claire Underwood (Online)

## Appendix C. Stories

The screenshot shows the Esteam interface with a banner "A moment out of our busy lives." by Nick Fury. The navigation bar includes links for HOME, STORIES, DOC BLOG, and INBOX. A notification icon for "Mojo" is also present.

The main content area has a dark background with a blurred image of a road through a forest. On the left, a sidebar titled "Stories" lists several story cards:

- Music to my ears** by Bruce Wayne (Now) - 35 likes, 6 comments
- In search of happiness** by Jeff Beck (2h ago) - 22 likes, 5 comments
- Battle with side effects** by Ned Stark (Yesterday) - 26 likes, 15 comments
- A day in their shoes** by Bilbo Baggins (2 days ago) - 64 likes, 3 comments
- Story of my life** by R2D2 (March 31, 2015) - 28 likes, 14 comments
- Few right reasons** by Aquaman (March 29, 2015) - 17 likes, 2 comments

On the right, a larger panel displays the details of the story "The story of my life" by R2D2:

**The story of my life**  
By R2D2 on march 31, 2015  
28 Likes | No Comments

The story content is a long, dense block of Latin placeholder text (Lorem ipsum).

Below the story content are three interaction buttons: "Like", "Add Comment", and "Send to Inbox".

## Appendix D. Doc Blog

The screenshots illustrate the Esteem platform's interface for the Doc Blog section, featuring a dark-themed design with purple and white accents.

**Screenshot 1: Home Page**

- Header:** Shows the Esteem logo, navigation links (HOME, STORIES, DOC BLOG, INBOX), and a notification bell icon labeled "Mojo".
- Main Content:** A large banner for an article titled "Six ways to combat everyday depression." by Dr. Stanley Watson. Below it is a grid of smaller article cards.
- Article Grid:** Displays 8 articles with the following details:
  - Heart healthy Diet (Dr. Rosen) - Now, 35 likes, 6 comments
  - Dealing with side affects (Dr. Phil) - 2h ago, 22 likes, 5 comments
  - Measures for adherence (Dr. House) - Yesterday, 26 likes, 15 comments
  - Workout for Happiness (Dr. Phil) - 2 days ago, 64 likes, 3 comments
  - Yet another article (Dr. Rosen) - March 31, 2015, 28 likes, 14 comments
  - Gateway to nothing (Dr. Bored) - March 29, 2015, 17 likes, 2 comments

**Screenshot 2: Article Detail View**

- Header:** Shows the Esteem logo, navigation links, and a notification bell icon labeled "Mojo".
- Content:** An article titled "Heart healthy Diet" by Dr. Jessica Rosen on April 8, 2015. The article content is placeholder text: "Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum." Below the text are interaction buttons: Like, Add Comment, and Send to Inbox.

**Screenshot 3: Author Profile Overlay**

- Header:** Shows the Esteem logo, navigation links, and a notification bell icon labeled "Mojo".
- Content:** An article titled "Six ways to combat everyday depression." by Dr. Stanley Watson. An overlay window for Dr. Jessica Rosen is displayed, showing her profile picture, name, title ("Gerontology Specialist M.D., MASc"), and a message: "Dr. Rosen wrote 31 articles so far. [View all](#)". Below the overlay are buttons for MESSAGE and PROFILE.
- Right Sidebar:** "Your Esteem Team" section listing team members with their icons and status (Online/Offline).

## Appendix E. Inbox

The screenshot shows the Esteam inbox interface. On the left, there's a sidebar with navigation links: NEW MESSAGE, UNREAD, SENT, FAVORITES, ARCHIVES, ALL MAIL, and TRASH. The main area lists messages from various users:

- Leia Organa** - Inspired by your story, 2h ago. Message content: Hello there! Your story on burning waffles and hanging them around is ...
- Jeff Beck** - Sed ut perspiciatis, 9:30 AM. Message content: Veritas et quasi architecto beatae vitae dicta sunt explicabo nemo ...
- Dr. Nick Fury** - Eaque ipsa quae ab, Yesterday. Message content: qui dolorem ipsum quia dolor sit amet, consectetur, adipisci velit, eti op ...
- Leia Organa** - Nemo enim ipsam, Yesterday. Message content: Hello there! Your story on burning waffles and hanging them around is ...
- Marvin** - I'm more powerful, 30 March. Message content: Quis autem vel eum lure reprehenderit qui in ea voluptate velit esse quam ...
- Ned Stark** - Winterfell closing down, 27 March. Message content: Due to unavoidable attacks I'm sorry to announce that I'm dead and will ...
- Leia Organa** - Yet another email, 22 March. Message content: Hello there! Your story on burning waffles and hanging them around is ...
- Dr. Stanley Watson** - Checking in, 22 March. Message content: Hello there! This email is useless it really doesn't say anything except for ...
- Bilbo Baggins** - Inspired by your story, 2h ago. Message content: Hello there! Your storv on burning

On the right, there's a search bar and a section titled "Inspired by your story" with a message from **Leia Organa** at 9:30 AM. The message reads:

Hello there!

Your story on burning waffles and hanging them around your neck is so very inspiring. I'm going to do that to school everyday. Lorem ipsum dolor sit amet, consectetur adipisciing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat cupidatat non proident.

Regards,  
Leia

Below this, there's a message from **You** at 4:11:25 AM:

Hi Leia,

Thank you very much. I'm glad you liked my hopeless idea. quis nostrud exercitation ullamco laboris nisi ut aliquip ex ea commodo consequat. Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur. Excepteur sint occaecat

Cheers,  
Mojo

At the bottom, there are "Reply" and "Forward" buttons.

## Appendix F. Talk Now

The screenshot shows the Esteam "Talk Now" feature interface. It includes a navigation bar with HOME, STORIES, DOC BLOG, and INBOX, along with a user profile for "Mojo".

The main area features a "VALUES" section with icons for Capable, Responsible, Honest, Courageous, and Something. Below this is a "WEEK" section with a circular progress bar and a "TODAY" section showing "0900 Foodbox". To the right is a "FEELING" section with a mood meter.

Two "TALK" buttons are present: "Health Coach" (with a doctor icon) and "Emergency? call for immediate response" (with a 24-hour clock icon). A "TALK NOW" button is also visible.

The interface is divided into sections:

- Featured Discussion:** "Do hobbits adhere to medication? What can we learn from their medication habits and ever happy lives?" by Ned Stark, 1hr ago, 7 responses. Includes a "View more responses" link.
- Other Discussions:** "At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis pras voluntatum deleniti atque corrupti quos dolores et quas." by Ginny Weasley, 1hr ago, 7 responses.
- Your Esteem Team:** A list of team members with their names, profiles, and status (e.g., Han Solo Online, Bilbo Baggins Offline).

In the second half of the interface, the "TALK" buttons change to "Video Call" and "Text Chat". The "Featured Discussion" and "Other Discussions" sections remain the same, but the "Your Esteem Team" section changes to show different team members.

## Appendix G. Status Chart

team

HOME STORIES DOC BLOG INBOX

Mojo

VALUES  
Capable  
Responsible  
Honest  
Courageous  
Something

Featured Discussions

Do hobbits adapt to new habits and environments?  
By Ned Stark · 1 hour ago

Do hobbits adapt to new habits and environments?  
By Bilbo Baggins · 1 hour ago

Excepteur sint occaecat cupidatat non proident, sunt in culpa qui officia deserunt mollit anim id est laborum.  
By Jeff Beck · 1 hour ago

View 5 more responses

**Stats**

The piechart on the left shows how you have been feeling over a set period of time. Click on a slice to drill-down into how your adherence track was. This will be displayed in the chart to the right.

Last Week

**Left Piechart:**

- Happy (Purple)
- Sad (Dark Purple)
- Neutral (Light Purple)
- Frustrated (Very Light Purple)

**Right Piechart:**

- Took All Meds (Green) - 38%
- Took Some Meds (Yellow) - 24%
- Took No Meds (Red) - 20%
- No Data (Grey) - 18%

**Other Discussions**

At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis praesentium voluptatum deleniti atque corrupti quos dolores et quas .  
By Ginny Weasley · 1hr ago · 7 Responses

At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis praesentium voluptatum deleniti atque corrupti quos dolores et quas .  
By Ned Stark · 1hr ago · 7 Responses

At vero eos et accusamus et iusto odio dignissimos ducimus qui blanditiis praesentium voluptatum deleniti atque corrupti quos dolores et quas .

**Participants:**

- Jeff Beck (Offline)
- Ginny Weasley (Offline)
- Ned Stark (Online)
- Claire Underwood (Online)