

# **Health Care Information Television App**

## **1. What is the Health care information television app?**

Currently, global countries are facing a rapid aging of their population, due to this rise many industries are designing products that keep the elderly in mind. In the field of digital technology, more designers are also concerned with the utility of products for the elderly. This has become a popular audience to design for.

The Health Care Information company products develops products ranging from smart television to medicare software (media care television app) for remotely administering education, communication, entertainment and enterprise apps that increase patient satisfaction and enhance productivity of staff. With the media care television app, patients can call for private service, learn from health care video and take the medical care test. We call this series of products the health care information television app.

## 2. Design process overview

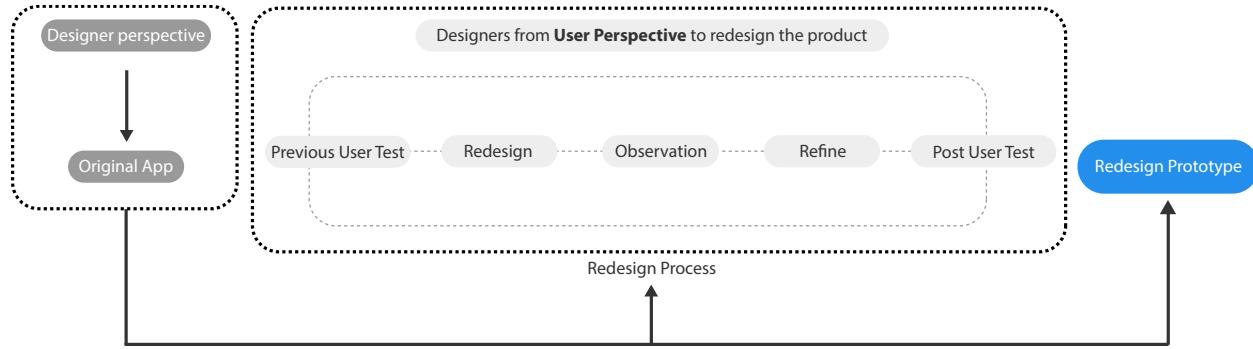


Figure 1. *Design process of the Health Care Information television app project.*

The original Health care television app has been used for few years, but based on informal user feedback the original product had a discontented experience for users. The Health care television app redesign adopted the two perspectives from designers and users to redesign the project (Figure 1). Designers focused on the product features and the product characters in the original product, then designers from user perspective to improve the user's experience and satisfaction in the redesign process.

### 3. Find the problems

#### 3.1 Interview

Health care information established sound cooperation relationships with some companies or hospitals to help us find target users for interviews. We selected five participants randomly to join the user interview and user testing. Before user testing, design (control) group will interview five participants to observe how users use the television app and what problems they encounter. Try to find the challenge for designers. (Figure 2).

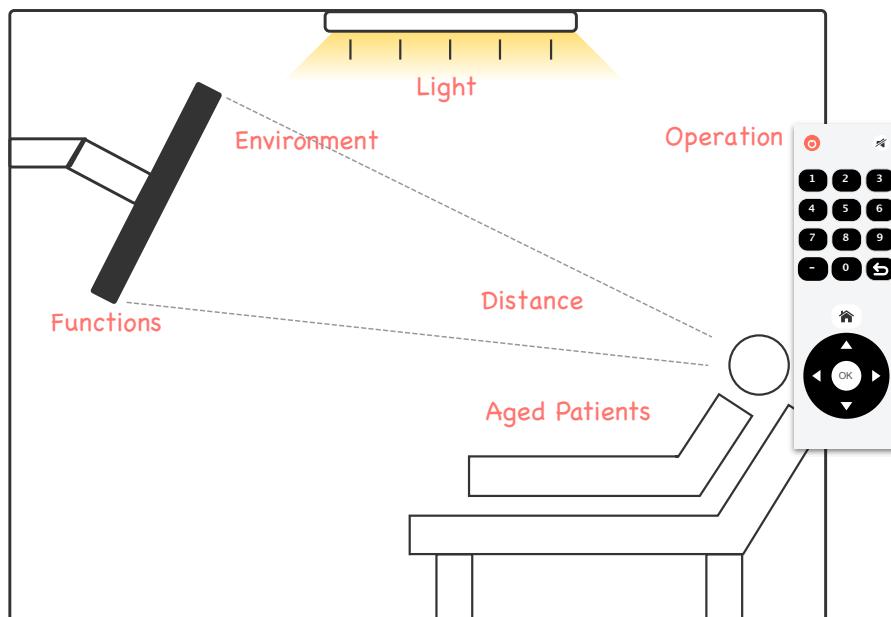


Figure 2. Simulate actual environment for users using the remote to control our product.

## 3.2 Challenge

The target user group for the health care information television app are patients aged 60-year-old and older who have chronic diseases and a range of physical and psychological problems.

Human's vision begins to degenerate at the age of 40 and many can gradually form presbyopia. Meanwhile, for the elderly, "color vision" also degrades with increased age, and thus it is difficult to distinguish between similar colors. Also, many elder people suffer from bad flexibility and coordination with increasing age. These attribute will affect aged peoples use of the remote that is used to interact with the app. On the psychological end, anxiety, irritability and lack of interest are common problems among aged people. Many of these people use remotes to control the television. However, it is not a good way to interact with elderly users. We should consider more about how to design a friendly and comfortably experience for users. The actual environment is one of the factors that will effect usage (Figure 3).

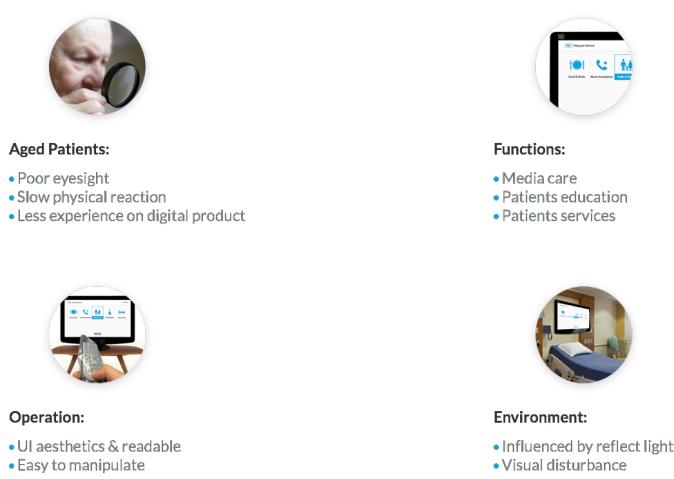


Figure 3. Four challenges for redesign HCI project.

### 3.3 Previous User Testing

The core elements to improve the experience for users, we should be focused on user's satisfaction (Hedonic) and manipulation (Pragmatic). In the following example of user testing, I recorded specific times and clicks to observe users' difficulties in using the product, then the participants evaluated the product on a scale 1 to 5 (Figure 4). I will describe two points of the user test below:

1. Simulate actual environment for users using the product.
2. The circumstances in which we would record anticipated use and reflection on use.

<p><b>Pragmatic</b></p> <p>Task</p> <p>1. Go to Education section, entre education library, focus on oceans 13 &amp; go back to education section.</p> <p>Time:</p> <p>Click:</p> <p>2. Go to Patient Test section, finish the test.</p> <p>Time:</p> <p>Click:</p>	<p><b>Hedonic</b></p> <p>Satisfaction</p> <table><tr><td>Unsatisfactory</td><td>OK</td><td>Satisfaction</td></tr><tr><td>●</td><td>●</td><td>●</td></tr></table> <p>Operation Logic</p> <table><tr><td>Hard</td><td>Fine</td><td>Easy</td></tr><tr><td>●</td><td>●</td><td>●</td></tr></table>	Unsatisfactory	OK	Satisfaction	●	●	●	Hard	Fine	Easy	●	●	●
Unsatisfactory	OK	Satisfaction											
●	●	●											
Hard	Fine	Easy											
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Figure 4. Task for user test.

The results of the user test shows that the product has an unsatisfactory user experience. The level of “user satisfaction” was mostly around “unsatisfactory” and “ok”. Users “times” and “clicks” exceeded our estimates by double. We need to figure out how to improve a better experience for users (Figure 5).

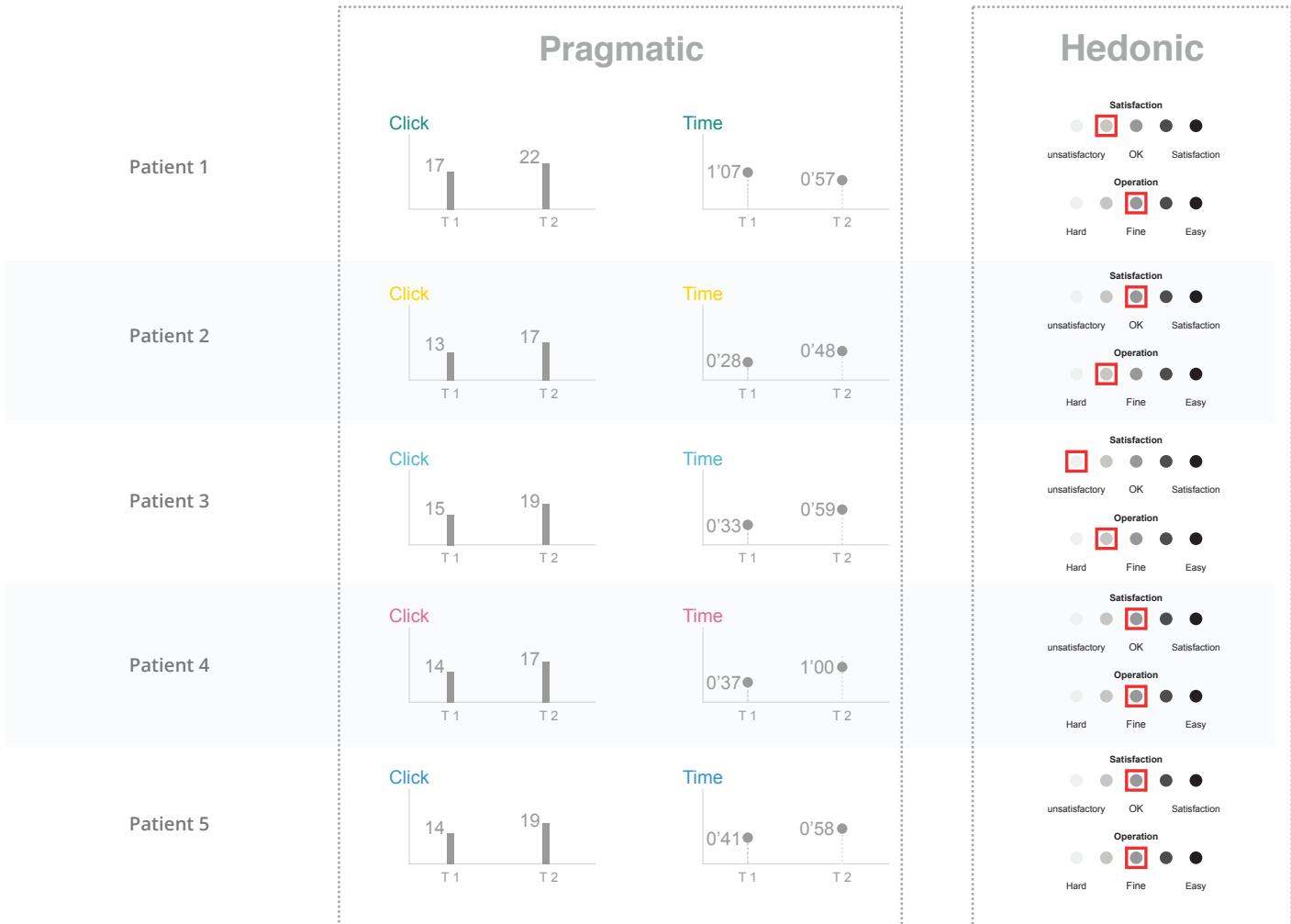


Figure 5. Previous record data.

### 3.4 Define Problem

Organizing the information and data for the user testing and interview, we made a significant problems list to show the problems of the product (Figure 6). The problems concentrate on reflected environment light, color contrast, information layout, operation continuity, size and weight of the font, reminder information and so on. We divided problems in to three categories: environment problems, interface problems and interaction problems. I will explain these in more detail in the redesign section.

Environment	Interface	Interaction
<ul style="list-style-type: none"><li>- Due to the reflected ambient light, it is hard to read the information on television.</li><li>- There is 100 - 120 inches between television and patients, the font size and font weight should be more readable.</li><li>- Should be more considerate of aged people.</li></ul>	<ul style="list-style-type: none"><li>- Information needs re-layout</li><li>- Create information hierarchy to help patient read information</li><li>- Selected box should be more clear to help patient understand which selected box they are focused</li><li>- Selected box status: focus, selected, hit, re-selected</li><li>- Change some information into visual information to help patient more understandable</li><li>- Color should be more friendly</li><li>- Change the red color</li><li>- Simplify the information</li></ul>	<ul style="list-style-type: none"><li>- Saltatory operation undesirable.</li><li>- Reduce operation steps.</li><li>- Various way of interaction to show the information.</li><li>- Operational continuity</li></ul>

Figure 6. Problem list.

### 3.5 Redesign

Some of the obvious questions can be solved by a designer. Designers are good at designing the clear interface, readable information and accessible functionality, helping users have a better experience than before. The redesign prototypes (Figure 7) have a better information hierarchy, show the information more clearly and readably. We contacted the programmer to reduce the operation steps, to make the animation more comfortable.

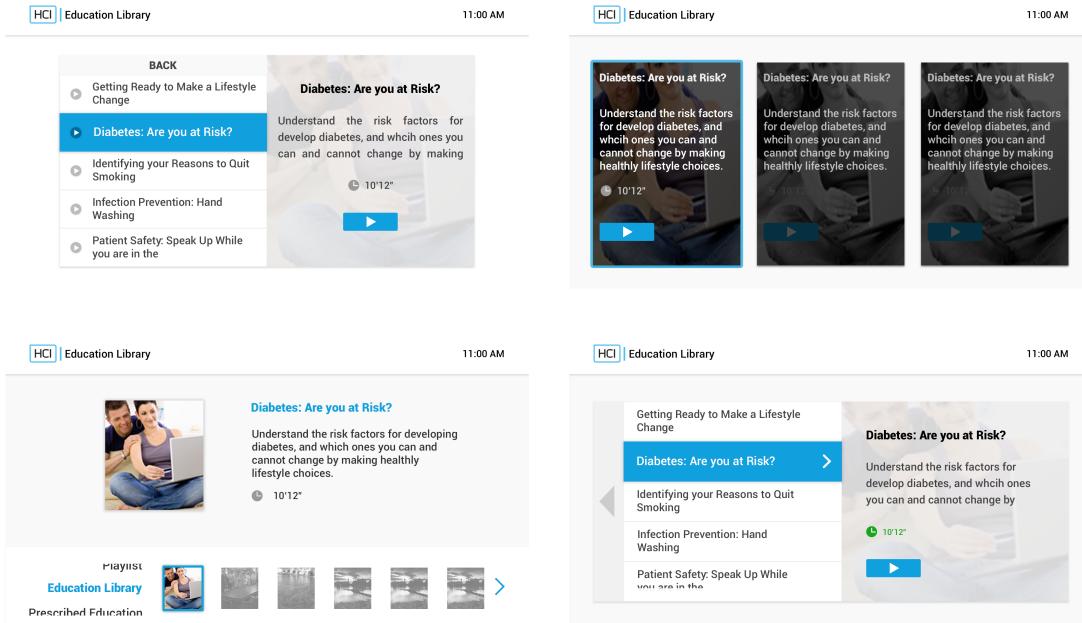


Figure 7. Four prototypes with same content.

### 3.6 Refine

Programmers help us to build the new product interface to be used in a user test. We invited five participants to try our new product interface, observed and talked with them to find some problems that we missed in the first user test, and then from the user's perspective we refined our product.

#### 1. Does the user really want this?

Studies have shown that users do not read the information, they scan it. Most designers design the information contents to have a clear visual structure, in order to make the information readable. A designer's goal is to layout a clear content hierarchy without too much focus on beautiful embellishments. This is a good way to design the information contents; however, there may be an issue that the designer neglected to consider, which is what information does the user really want to read?

For instance (Figure 8), a viewer wants to watch a film from an online source. If the information hierarchy is unclear, it can be difficult for the user to make a selection. The user will not read the detailed information if they are not interested in the information that they are getting from the title, or if the video takes too much time (a portion of users will abandon watching the video if they know it will take a long time).

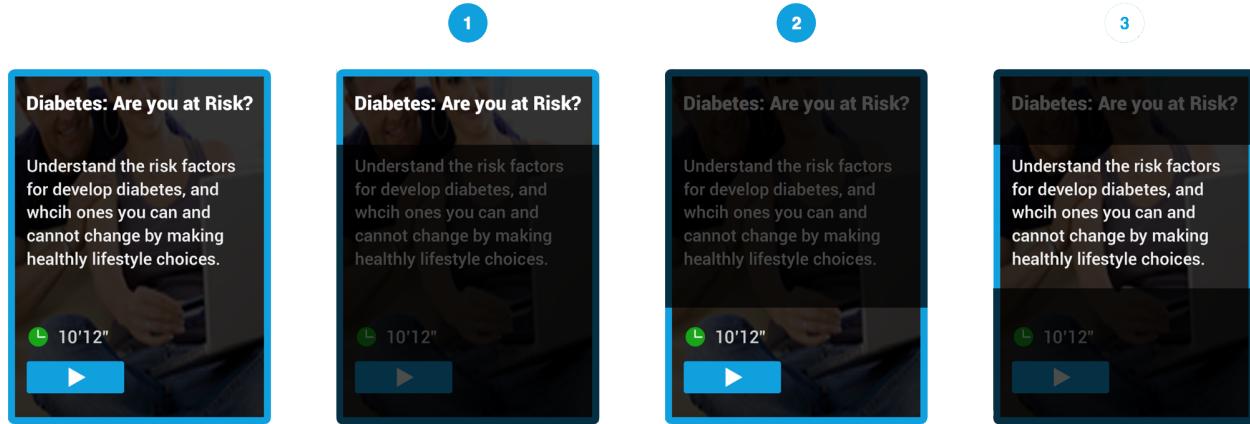


Figure 8. How the users reading the information.

## 2. Patients are comparatively sensitive when they stay at a hospital.

Due to the patient being comparatively sensitive when they stay at a hospital, there have been a few problems that we missed. It seems that some specific elements (colors, symbols, text) will result in a psychological burden on patients. The following is an example to aforementioned problem:

***There is a patient who asked “can you change the red into another color please? I like the red but it hard to say this feeling, I am not feeling good when I see the red color in hospital.”***

Red, as a general color used in an alert box and with incorrect instruction of the interface, should not be applied into the health care television app; it may give rise to a

patient's psychological reactions. Besides red, orange can also define the warning and incorrect information, it is more friendly for patients ( Figure 9).



Figure 9. Refine color.

### 3.7 Prototype

We made the product's interface beautiful, information more readable and refine the product function in the final prototype (Figure 10).

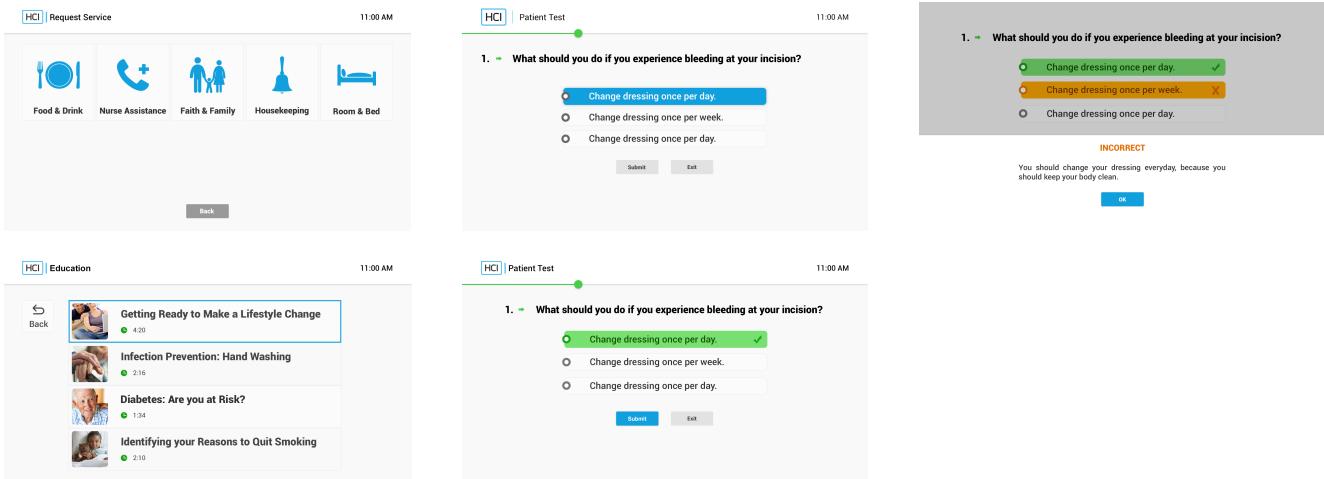


Figure 10. Part of the prototypes.

### 1. Refine the function

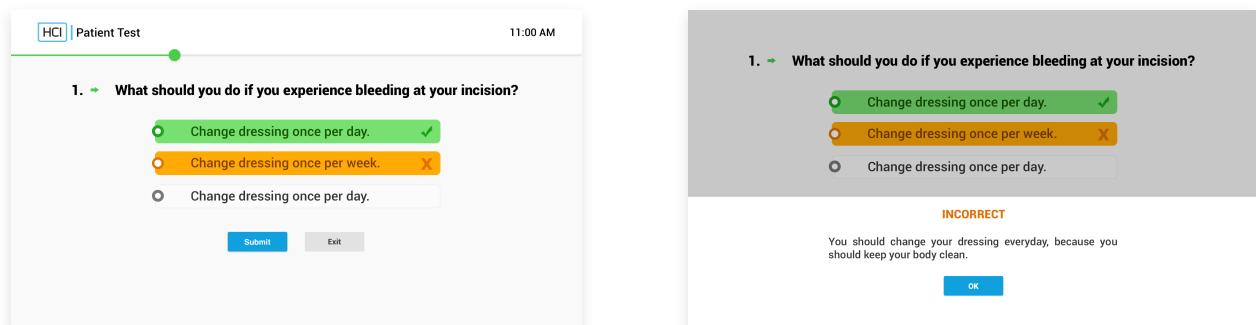


Figure 11. Refine the function for patient test section.

We want help user better understand and learn from the patient test section. We designed a friendly way to help a user better know the correct or incorrect answer and why the answer is correct or incorrect in the patient test section (Figure 19).

## 2. Identify the Icon

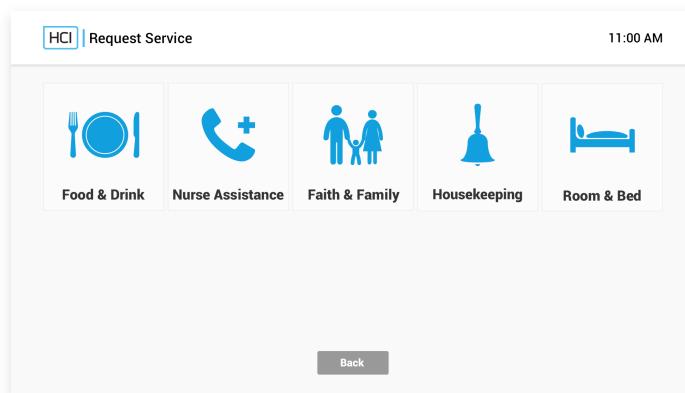


Figure 12. product attribute - identification for patient survey section.

The user chose all the icons that we used in the prototype, they could identify content meaning by the icons in the patient survey section (Figure12).

## 3. Manipulation

User prefer a fewer operation steps and accessible operation pattern for a product. Users can not operate our product as their expected, because of our product operation

pattern is different than general television's operation pattern. In operation, we learned from the users general familiarity with television operation to use the users previous experience with television remote controls to rebuild the operation pattern for the prototype using a television remote, and design the a fewer operation steps as possible as we can (Figure 13).

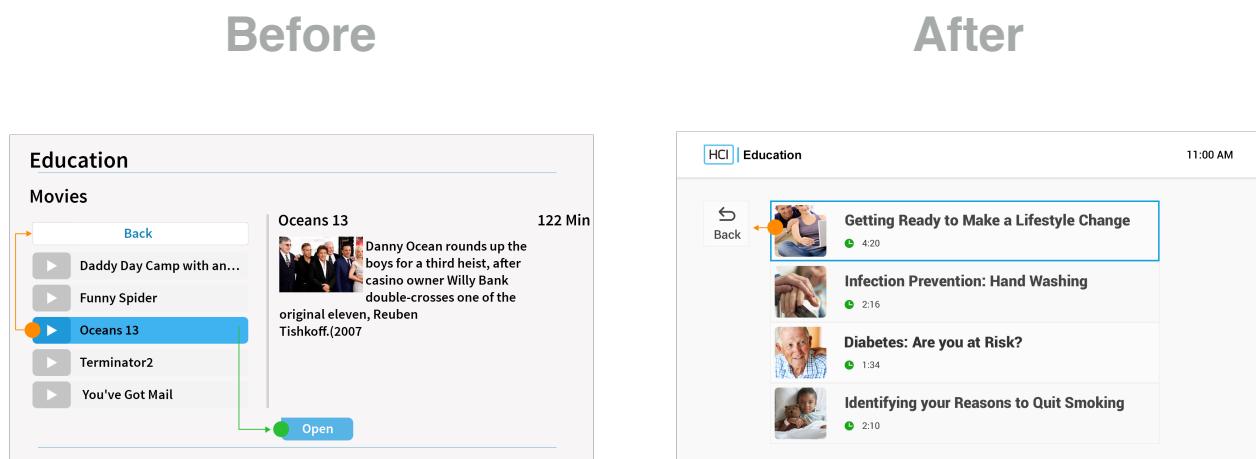


Figure 13. *product attributes - evocation and manipulation in education section.*

### 3.8 Post User Testing

After programmers completed implementation of the prototype revisions, we ran the same user test as we did in the previous user test (Figure 4), then we gathered the data (Figure 14). The data shows clicks and time are lower than on the previous test (Figure 5).

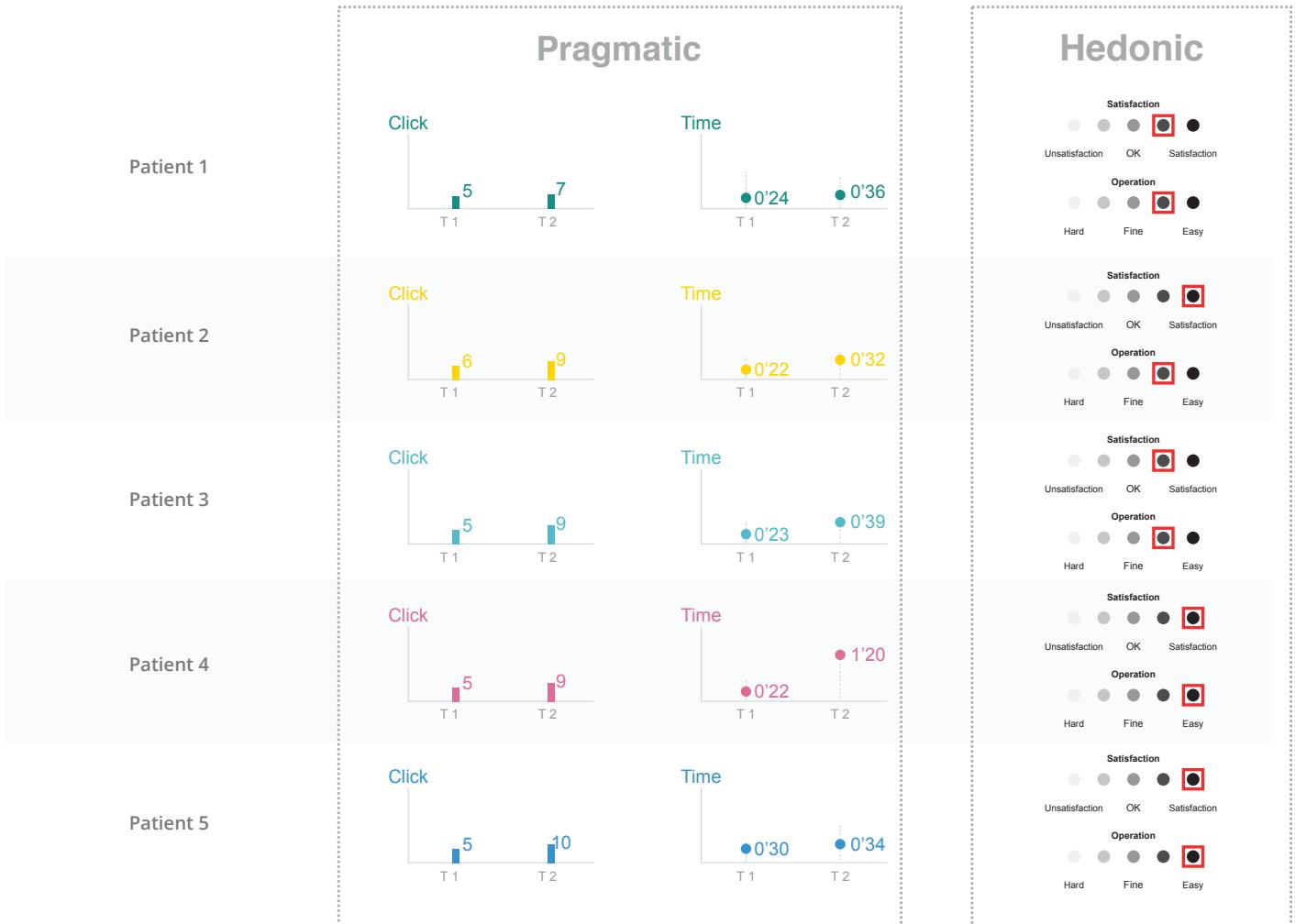


Figure 14. Post record data.

### 3.9 Comparing before and after

We compared the data between the original and redesigned app to analyze whether the design proposal is valid or not. The above chart shows the change in test times and the number of clicks (Figure 15). The data shows the change in the increase of satisfaction and intelligibility. The redesigned plan demonstrated significant improvement as shown by the comparison data. From the overall look of the chart, we can see that for patient 1 to patient 5, the number of clicks and test times reduce rapidly, also the data shows much more satisfying results between satisfaction and accessibility.

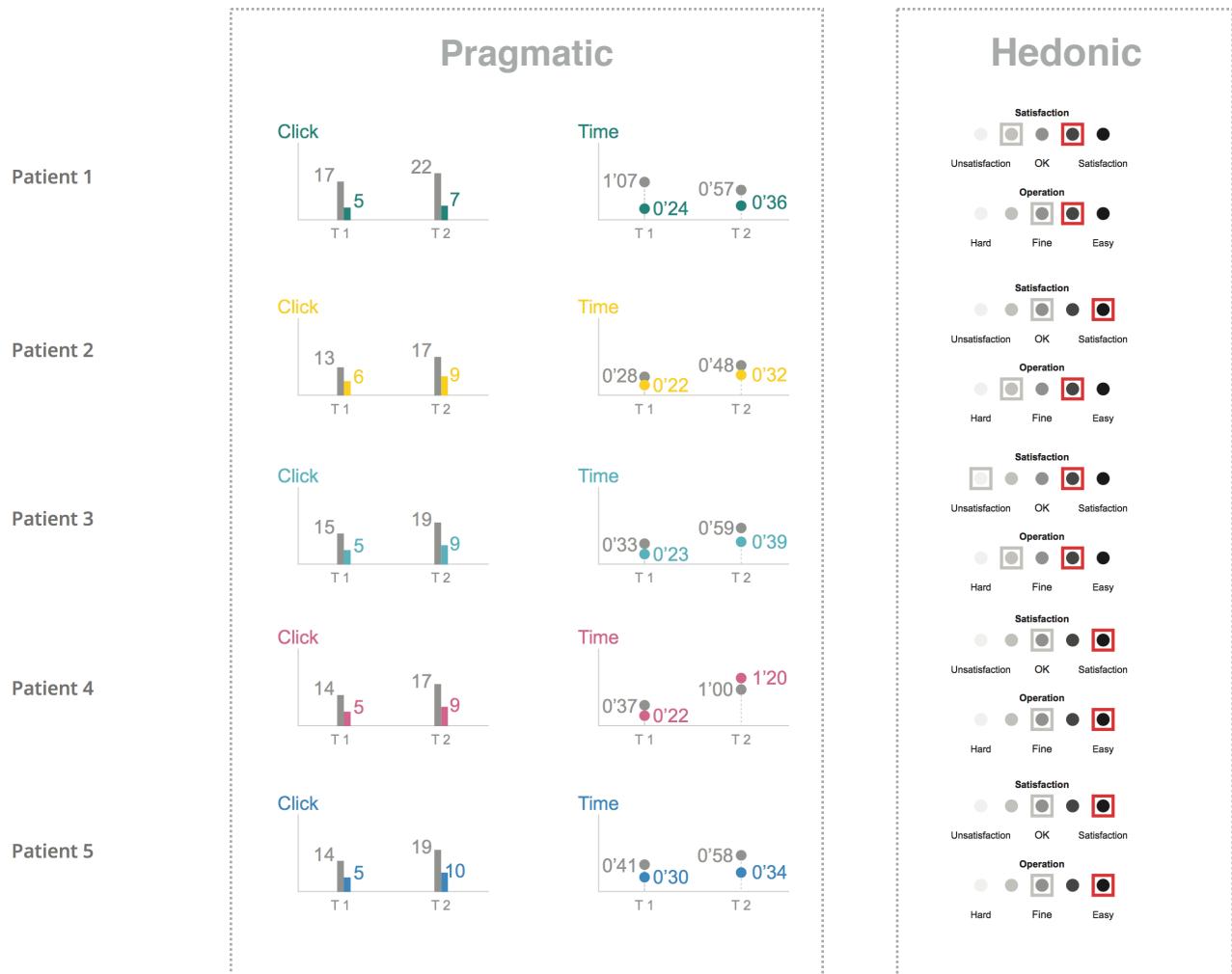


Figure 15. Compare the record data.

Using a T-test demonstrates the design plan success. The P-value is one of the most important factors in the T-test, it is the reference standard to demonstrate the test result of significant or insignificant. In statistics, the p-value is a function of the observed sample results (a statistic) that is used for testing a statistical hypothesis (P-value). Retrieved from <https://en.wikipedia.org/wiki/P-value>). If the P-value is lower than 0.01, the result is more significant; conversely ( $P>0.05$ ), the result is insignificant. We assigned specific values for different evaluation levels of satisfaction and operational difficulty; computed the mean value of the numbers of clicks and times, use then calculated the P-value of the different between the two tests. The chart shows all the P-value is much lower than 0.01, in other word, the redesign is significant improved (Figure 16).

**P-value > 0.05    insignificant**  
**0.05 > P-value > 0.01    almost significant**  
**P-value < 0.01    significant**

**Satisfaction** P-Value equals **0.0069**  
**Operation** P-Value equals **0.0038**  
**Clicks** P-Value is less than **0.0001**  
**Times** P-Value equals **0.0353**

Figure 16. Data's P-value.