Design for long distance relationships

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Design for Long Distance Relationships

By

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"The best and most beautiful things in the world cannot be seen or even touched. They must be felt with the heart." — Helen Keller
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Abstract

The problem of LDRs (Long distance relationships)

Does holding on to the mantra “distance makes the heart grow fonder” begin to give you some doubts? If you are troubled by your long distance relationship, you are not alone. According to Ezinearticles.com, “an estimated 2.9% of US marriages were considered long distance, with 1 in 10 marriages reported to have included a period at long distance within the first 3 years. Between 25–40% of all romantic relationships among students attending colleges across the US are Long Distances.”

Every day on the planet, millions of people have no choice but to deal with being miles apart from their loved ones. LDRs (long distance relationship) are currently a big problem that need to be solved. This problem contains two major elements:

1. Emotional—LDRs are not static; misperceptions about the status of your relationship and each other can arise if you don’t communicate regularly.
2. Physical—A solid relationship can break down by a lack of physical dimension.
Design intent

Design a more comfortable and easy way to communicate and help long distance couples have a healthier relationship.

Based on this problem statement, I will collect information online and analyze it, and determining the advantages and disadvantages of long distance relationships.

Advantages:

1. Know each other even better.
2. Better for personal development.
3. Good time to rebuild the relationship.
4. Recount wonderful things you do for each other/ how much you mean to each other.

Disadvantages:

1. Expensive (air tickets, telephone bills, gifts)
2. Lack of physical dimension
   Although there is a lot of new technology that can help lovers communicate, they still can’t touch each other. That’s also the top 5 problems of LDR as shown in the results of my research.
3. Misunderstanding
   Although you can use a lot of methods to keep in touch with your lovers, if you don’t trust each other enough, sometimes even a missed call can create
big trouble.

4. Interference

A lot of times, this kind of interference is sweet, but in the long run, too close of a relationship isn’t a good idea.

For achieving the final goal, my design should avoid the disadvantages of LDRs and sustain the advantages of LDRs. It may contain at least one of the elements below and also the POG (Product Opportunity Gap):

**POG:**

1. Create a physical dimension. （Use haptic technology）
2. Avoid a misunderstanding.
3. Keep the focus when communicating.
4. Schedule chatting time.
Research Content:

1. Face-to-face interviews with some long distance lovers.

In this section, I do an interview with three long distance couples. All of them are RIT students, but their situations are not the same. Tianshu Liu’s girlfriend is in China; the distance between them is about 10000 miles. Chen An’s girlfriend is in Italy, which is 5000 miles away from Rochester. Mi-hee Hong’s boyfriend is in Syracuse, which is only a one-hour driving distance from Rochester. Depending on the different distances, these couples have different ways to deal with their LDRs. For Tianshu Liu, he can only see his girlfriend every six months to one year and he and his girlfriend have a 12-hour time difference, so the preferred communication method for them is telephone or
Skype video chat. Considering the cost, the telephone is only used in emergency situations, so they use Skype as their main method of communication. For Chen An, the situation is almost the same: he and his girlfriend have a six-hour time difference. They can only see each other in person every half a year, so most of the time they chat by Skype, and sometimes use it for video chat. But Mi-hee Hong’s situation is a little bit different: because she and her boyfriend don’t have any time difference, they can chat anytime by cell phone, and they can see each other every week. So these varied backgrounds determine the different expectations of these three couples. For Tianshu Liu, his problem is long term and long distance separation. He and his girlfriend are at almost two ends of the earth, USA and China, so they meet a lot on Time Leg. Time difference, They sometimes misunderstand problems during their conversations. The expectation they have is to listen to the voice of each other and also find a way to reorganize their chatting time. Chen An also has the same problem as Tianshu Liu; the only difference is he doesn’t want to reorganize their chatting time as he thinks it is very relaxed to have such a flexible schedule. Mi-hee Hong don’t have the time difference problem, but she also wants to be able to touch her boyfriend during their separation. The biggest problem for her is maintaining attention during long distance communication: she and her boyfriend sometimes will lose attention or focus, and this always creates an argument between them; they want to find a way to deal with this.
2. Literature Review

The Long Distance Relationship Guidebook by Sylvia Shipp

The author, Sylvia Shipp, has a lot of long distance relationship experience, so the Long Distance Relationship Guidebook is written from her heart, head, and soul. As a LDC (Long Distance Couple), I was deeply touched by and satisfied with this book for several reasons. I found comfort and insight in the book, and it improved my ability to solve a host of problems particular to LDRs. In addition, as a result of a greater understanding of my own personal unique situation, I also found inspiration to strengthen my bond and celebrate my love with new vitality and confidence.

A General Theory of Love by Richard Lewis Thomas; Amini Fari; Lannon

A General Theory of Love draws on the latest scientific research to demonstrate that our nervous systems are not self-contained: from earliest childhood, our brains actually link with those of the people close to us, in a silent rhythm that alters the very structure of our brains, establishes life-long emotional patterns, and makes us, in large part, who we are. Explaining how relationships function, how parents shape their child’s developing self, how psychotherapy really works, and how our society dangerously flouts essential emotional laws, this is a work of rare passion and eloquence that will forever change the way you think about human intimacy.

After the book reading section, I renewed the POG (spell out/define), and add
four new elements:

**POG update 1:**

1. Create a physical dimension (Touch).
2. Avoid misunderstanding.
3. Keep focus when communication.
4. Schedule chatting time.
5. Update the information of your partner.
6. Meeting time planning.
7. Cost savings for LDRs.
8. Memory reminder.


In this section, I researched LDRs based on the internet, I browsed a lot of websites and BBS related to LDRs, and collected some useful information from this result. And after that, I conducted a survey on Survey Monkey based
on this information.
## 1. Are you male or female?

<table>
<thead>
<tr>
<th></th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>50.0%</td>
<td>9</td>
</tr>
<tr>
<td>Female</td>
<td>50.0%</td>
<td>9</td>
</tr>
</tbody>
</table>

- answered question: 18
- skipped question: 0

## 2. Which category below includes your age?

<table>
<thead>
<tr>
<th>Category</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 or younger</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>18-20</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>21-29</td>
<td>94.4%</td>
<td>17</td>
</tr>
<tr>
<td>30-39</td>
<td>5.6%</td>
<td>1</td>
</tr>
<tr>
<td>40-49</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>50-59</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>60 or older</td>
<td>0.0%</td>
<td>0</td>
</tr>
</tbody>
</table>

- answered question: 18
- skipped question: 0

## 3. How long have you had a long distance relationship?

<table>
<thead>
<tr>
<th>Duration</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 3 month</td>
<td>27.8%</td>
<td>5</td>
</tr>
<tr>
<td>3 month - 1 year</td>
<td>16.7%</td>
<td>3</td>
</tr>
<tr>
<td>1 year - 3 years</td>
<td>22.2%</td>
<td>4</td>
</tr>
<tr>
<td>More than 3 years</td>
<td>33.3%</td>
<td>6</td>
</tr>
</tbody>
</table>

- answered question: 18
- skipped question: 0
### 4. How long you can see each other for a once?

<table>
<thead>
<tr>
<th>Duration</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 1 week</td>
<td>11.1%</td>
<td>2</td>
</tr>
<tr>
<td>1 week to 3 months</td>
<td>11.1%</td>
<td>2</td>
</tr>
<tr>
<td>3 months to 6 months</td>
<td>22.2%</td>
<td>4</td>
</tr>
<tr>
<td>6 months to 1 year</td>
<td>44.4%</td>
<td>8</td>
</tr>
<tr>
<td>more than 1 year</td>
<td>11.1%</td>
<td>2</td>
</tr>
</tbody>
</table>

answered question: 18
skipped question: 0

### 5. Overall, are you satisfied with your long distance relationship, neither satisfied or dissatisfied with it, or dissatisfied with it?

<table>
<thead>
<tr>
<th>Satisfaction Level</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely satisfied</td>
<td>5.6%</td>
<td>1</td>
</tr>
<tr>
<td>Moderately satisfied</td>
<td>38.9%</td>
<td>7</td>
</tr>
<tr>
<td>Slightly satisfied</td>
<td>11.1%</td>
<td>2</td>
</tr>
<tr>
<td>Neither satisfied nor dissatisfied</td>
<td>16.7%</td>
<td>3</td>
</tr>
<tr>
<td>Slightly dissatisfied</td>
<td>11.1%</td>
<td>2</td>
</tr>
<tr>
<td>Moderately dissatisfied</td>
<td>5.6%</td>
<td>1</td>
</tr>
<tr>
<td>Extremely dissatisfied</td>
<td>11.1%</td>
<td>2</td>
</tr>
</tbody>
</table>

answered question: 18
skipped question: 0

### 6. If you are not satisfied with the relationship, why not?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>We have little common topic</td>
<td>6.7%</td>
<td>1</td>
</tr>
<tr>
<td>I always don't know what he/she was doing</td>
<td>33.3%</td>
<td>5</td>
</tr>
<tr>
<td>We have a lot of misunderstands</td>
<td>33.3%</td>
<td>5</td>
</tr>
<tr>
<td>I can't even touch her/him</td>
<td>26.7%</td>
<td>4</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

answered question: 15
skipped question: 3
### 7. If you are satisfied with this relationship, why?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is more romantic than face to face everyday.</td>
<td>13.3%</td>
<td>2</td>
</tr>
<tr>
<td>We respect each other more and pay more attention to other’s needs.</td>
<td>46.7%</td>
<td>7</td>
</tr>
<tr>
<td>I trust Her/Him, it’s a challenge for us.</td>
<td>20.0%</td>
<td>3</td>
</tr>
<tr>
<td>I feel more free.</td>
<td>20.0%</td>
<td>3</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>answered question</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>skipped question</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

### 8. What method do you use most to communicate with each other?

<table>
<thead>
<tr>
<th>Method</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mail</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>E-mail</td>
<td>0.0%</td>
<td>0</td>
</tr>
<tr>
<td>Video Chat</td>
<td>11.1%</td>
<td>2</td>
</tr>
<tr>
<td>Telephone call</td>
<td>83.3%</td>
<td>15</td>
</tr>
<tr>
<td>Facebook or other network community</td>
<td>5.6%</td>
<td>1</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>answered question</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>skipped question</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

### 9. What’s the biggest weakness of your communicate method?

<table>
<thead>
<tr>
<th>Weakness</th>
<th>Response Percent</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time lag</td>
<td>23.5%</td>
<td>4</td>
</tr>
<tr>
<td>I always lost my attention.</td>
<td>17.6%</td>
<td>3</td>
</tr>
<tr>
<td>We can’t use it in everywhere.</td>
<td>11.8%</td>
<td>2</td>
</tr>
<tr>
<td>I still can’t touch him/her.</td>
<td>47.1%</td>
<td>8</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>answered question</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>skipped question</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
A total of 219 people took part in the survey, and 194 people completed the survey. The difference between these two categories is unclear. In these 194 participants, the male to female ratio is almost one-to-one, with 92 males and 102 females. The ages of the participants were separated into four groups, with most participants from 21 to 29 years old, accounting for 68%. The second largest percentage is 21%, which was from 30 to 39 years old. The other two were 5% younger than 17 years old and 6% 40 years old or older. Sixty-one percent of all participants couldn't see each other for more than six months, 79% of them felt the lack of physical contact and 85% of them
used cell phones as a communication method and feel bad about it. The most tragic is that 57% of the participants have considered breaking up with their partners because of the distance.

On one hand, the survey proved the viewpoint I provided in the last two sections of my research; on the other hand, during the survey, I also discovered some new POG:

**POG update 2:**

1. Create a physical dimension（Touch）.
2. Avoid misunderstanding.
3. Keep focus when communicating.
4. Schedule chatting time.
5. Update the information of others.
6. Meeting time planning.
7. Cost savings for LDRs.
8. Memory reminder.
9. Age 18~35 around.
10. Attractive (High technology, Fashion)
11. Not too expensive.
5. **Research about the haptic.**

For achieving the goal of touch, I also conducted research about the haptic.

Definition: Haptic technology, or haptic, is a tactile feedback technology that takes advantage of a user's sense of touch by applying forces, vibrations, or motions to the user.

Everything haptic is based on some experience, nothing creates any new sense. So I worked to find a sense with which the LDC is familiar.

6. **Electric pulse technology.**

Electric pulse technology is not a new technology, but it is rarely applied to civilian uses. The reason I wanted to use it is because of the recommendation of some of my friends in the micro-engineering department. After the research, I found it was very suitable for my design, no matter the electric consumption or the haptic feeling of it.

**Possible solutions 1(1st semester)**

In this section, I did some brainstorming and created some initial ideas and made
them into a draft.

1. LDR Note.

This device is named LDR Notes. With its help, a user can leave a message for their lover thousands of miles away. The only thing a user needs to do is write down some notes on the touch screen, then press the send button; the message will then be sent to their loved one’s device immediately.
2. LDR Watch.

Details in the video

“JOIN HANDS” is a device that can help the LDLs (Long Distance Lovers) touch each other.

The holding hands function works similar to the electronic blood pressure meter: when a user presses the blue button, the holding hands function will be triggered on the other watch the user’s lover wears.

The top of the screen shows the lover’s information like status, time, temperature, voice message, and the most important thing, mood index. I am still considering how to statistics the mood index. I tried to create a game. If and only if the mood index reaches 80% or more, a user can hold their lover’s hand, and get the other’s hold as a response. The main reason I created this game is to help long distance lovers have a
more healthy relationship.

Interface:
3. Haptic device

[Images of haptic devices and heart gestures, indicating ways to simulate touch and connection across long distances.]
Possible solutions 2(2nd semester)

Inspiration:

Whenever I consider the realities of LDRs, I feel it is a game about time. The reason why I said it is a time game is because every LDR has its different situation, no matter the distance or cultural background or even separation time, but they all have the same goal: reunion. The only measure of LDC is time. How to make the abstract time into a concrete item and use it in my design became an important consideration. Two things that inspired me a lot are a picture and an item. The picture is Dali’s “The Persistence of Time.” The melting pocket watch in the picture shows time’s softness and intangibility, so I wanted to borrow this feature of time and use it in my design. The item is the sand clock, which is the most traditional timer and is also very elegant and romantic.
Concept Development:

I kept the touch function of the device because the touch is a top need as shown in my research of LDC in the first section. But if the design only has the touch function, it would be very superficial. One most important thing that can help the LDC keep the long distance relationship is time; the partners can separate because they know they will meet again, and the most beneficial evidence for getting back together is time. So I wanted them to keep updating how many days they have been separated and how many days until they will meet again.
This is the design concept from my second semester. I call it TTT. The sand clock shape of the device is a timer that can record the separation time. This timer represents the first T(Time). The top half part of it shows how many days until the
LDC will meet again, the button part shows how many days the LDC have been separated from each other. The white ring beside the sand clock is the touch device, which represents the second and third T(Touch and Talk). The ring is a daytime device that can help the partners touch and communicate with each other in a very special way. The clock is a device for the home; when the user comes back to home, they can take off their ring and put it on the base to charge and update the daytime information from the ring to the sand clock. So users can see and hear the information in the sand clock.

This design is more like an interaction design, especially in its screen part. So a very important part of this design is the interface design. Besides the main body, I also made the interface design of it.
Interface

This is the main interface of the device. Just like the sand clock, the top part shows how long it still has and the bottom part shows how much time has passed. The only difference is that here is shown a much longer time than the sand clock.

I put a lot of “C” shape in the interface. Each one of them represents a day, just like the sand drops in a sand clock. The shape was actually abstracted from the ring (Haptic device), because I tried to create some relevance between this device and the interface, and the "C" shape also has a function, the gap of which also work as an index indicating the time change of a day. The picture is a change of three interfaces on a time basis. In the middle one there is a large "C" in the center that drops down from the top to the bottom. The gap now is turned to 1/3 of the circle, which means the time that has passed is 1/3 of a whole day.
This is the setting interface of TTT. Users can use this interface to set some special day in the system and when the special day comes, the device will remind the user.
Final solutions (Section 3: 3\textsuperscript{rd} semester)

1. Experiment

Before the later design process, I needed to experiment on the electric pulse technique. Richard Yao, a Micro Mechanical Engineer at RIT, allowed me to borrow the micro engineer lab for this experiment and with his help I conducted the experiment on October \textsc{day}, 2013.
Unfortunately, the experiment failed. The feeling of electric pulse is not like touch, and sometimes it is a little painful, so I had to find a new way to achieve the touch function of my design.
2. Useful Solution

I already had a clear direction, which was using a haptic technique to build a touch feeling for the LDCs. The only bottleneck for me to conquer was the technique part. Luckily, I finally found it. I saw an article online called “Squeeze Your Phone, and Send a Loved One a Hug.” One of my community members Shaun Foster shared this very useful information with me about a new Nor-Verbal method for communication, which added a touchy-feely element to voice conversations. This design is also very small and simple; it is based solely on a Process Element and a Vibration Element. Beside this, the device costs only 20 dollars. So I contacted the designer of “ForcePhone.” After I shared my information and reason for contacting her, she shared with me a lot of useful information about her design and even shared my her thesis. I found her design to have some weak points, such as when you chat with others and send a vibration at the same time by a cell phone these two actions create some kind of conflict. For example, when you are talking and your phone vibrates at the same time the noise creates by the vibration, so in my design I will pay more attention to this.
3. Concept Development

Until this point, I had the design inspiration, the initial idea, and the technical support, I only needed to push the design to a product level and make the prototype for it. In the TTT, which is the design in solution 2, the only weak point was the main body, which is too cold, and was a little bit far from the everyday lives of LDRs. So I turned to make this design more personal and romantic in this section.
4. **Simplified**

In this section I decided the final form of the design, which is keeping the shape of the twist sand clock but scaling it down to a necklace size. This necklace shape design can be an everyday accessory for the LDCs and also keeps the design more simple and pure.
Design For Long Distance Relationship

BY CHEN AN

Touchglass
Design For Long Distance Relationship

BY CHEN AN

Plan A

Vibrate

Plan B
5 Ideation Refinement:
Using yellow to sculpt the refined concept helped to shape the organic form before moving into the final design phase of computer modeling and rendering.
Charger Refine

Charger Plan--- Container
6 Model Making:
I used a 3d printer to make the Sandy’s necklace part and refine it with sandpaper and paint it at the end. The charger part is made from glass.
Paint: clarify

Polish
Reverse Mould:

Assembly
Effect Picture

A Design for Long Distance Relationship
7. Sandy Concept

Core concept:

Remind: When the LDC text or phone each other, the device will vibrate, so LDC will receive a special signal which is other than the ringtone or vibrate from the mobile phone. On the other hand the light intensity will become weak when you contact with your LDC too less.

Haptic: The blue button on top of the Sandy is the activate button, after activated, when you touch the device, an no-verbal message will send to the other terminal. On the other hand, when you text a message to your LDC the action of tapping will also sent to the other terminal and shows in vibrate. If you touch them together, a special interaction will trigger.
8. Interface:

Main:
The main interface shows the Separation Day for each LDC and also has four different option buttons.

Connection:
Interface for choosing different connection methods and see displays the power percentage.

Setting:
Interface for setting the separation time and special one (person you will separate with)

Record:
A special calling and message recording option for only you and your partner.

Video:
http://www.youtube.com/watch?v=Pvo-jLiZ9xw
References

The Long Distance Relationship Guidebook by Sylvia Shipp
A General Theory of Love by Richard Lewis, Thomas Amini, Fari Lannon
Squeeze Your Phone, and Send a Loved One a Hug
(http://www.technologyreview.com/view/429618/squeeze-your-phone-and-send-a-loved-one-a-hug/)
Novel Heterostructure Device for Electronic Pulse-Mode Neural Circuits by C. Song and K. P. Roenker
Organic electronic pulse generator by R. Toniolo, C.M. Lepienski and I.A. Hummel gen
Pressages: Augmenting Phone Calls with Non-Verbal Messages by Eve Hoggan, Craig Stewart, Laura Haverinen, Giulio Jacucci and Vuokko Lantz.