

User-Mobile Phone Interactions: A Postphenomenology Analysis

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Abstract. User-artefact interactions, to a great extent, are defined by their relations. On the other hand, different relations emerge from different interactions. In order to get a better understanding of this phenomenon, we start and focus on the relation studies. Based on the four human-artefact relations in postphenomenology, a framework was developed. Through applying the framework to a case analysis, we describe the dynamic user-mobile interactions in the use process. This paper provides a new perspective of the interactions between the user and the product. Theoretically, the framework offers a comprehensive picture of user-product relations; practically, designers can be inspired to think about the different kinds of relations from the very beginning of their design process and design for specific relations.

Keywords: interactions, relations, postphenomenology, framework, Village Phone Programme.

1 Introduction

Mobile phones have become an important part of our daily life, and there are more than 5.6 billion people using them every day¹. The use of mobile phones has changed people's behaviours and habits, and also changed the world.

Mobile phones, especially the smart phone, contain both hard-technologies (e.g. materials technology, processing technology, communication technology) and soft-technologies (software design, graphical design, user interface design). For the user, the mobile phone is not only a kind of man-made product in his/her hands, but also a platform or a machine, providing and producing various software and services with different functions; for the designer, to design a mobile phone is to design and provide an experience of how to interact with it, not only with the hardware, but also with the

¹ Source: <http://www.gartner.com/it/page.jsp?id=1759714>

software. This interaction can be regarded as a dialogue between a person and a product, service, or system [1]. The design of this interaction needs to focus on providing end users with a rich and satisfying mobile-communication experience [2].

Existing studies show that the user-mobile phone interactions research is mainly focussed on industrial design, product design, accessible possibilities [3], user experiences [4-5], and design innovation [6]. Those studies often reflect the designers' and innovators' standpoints; they are featured by empirical, experimental or problem-solving natures.

Postphenomenology studies start from a variety of use contexts where users' perceptions and experiences are mediated by artefacts, while artefacts acquire their meanings during the using process. Four basic models of user-artefact relations exist, i.e. embodiment relations, hermeneutic relations, alterity relations and background relations [7]. Each model can be regarded as a different interaction in a different use context. Based on the existing research, the authors have developed a framework (see Figure 1) to describe the four relations in the use process, and demonstrated how the user-artefact relations change from one kind of relation to another.

The case analysed in this paper, the Village Phone Programme (VPP), is about renting calling time of mobile phones in the rural areas of Bangladesh. This programme becomes well-known because of the tiny loans to poor rural women, funded by the Grameen Bank. One of the offshoots of the Grameen Bank, the Grameenphone, provides mobile phones for the buyers to rent the calling time. There are more than 100,000 people who buy the phones and then rent out the calling time to other people [8].

Through applying the framework to the analysis of the VPP, the authors reveal that different ways of using mobile phones for different purposes in specific use contexts lead to different kinds of user-mobile phone relations. Different relations are established through different user-mobile interactions, which can be understood as a multi-relational and dynamic use process. By following this process, designers can either re-design the existing relations, or create new ones.

The paper provides a new perspective of the interactions between the user and the product, and it will be divided into three parts: The first part, introducing the four basic relation models as a framework in postphenomenology; the second part, describing and analysing the Village Phone Programme (VPP) case through using the framework, to show the user-mobile phone interactions in the dynamic use process; the last part, discussing the findings and results of the user-mobile phone interactions in VPP, and providing suggestions.

1.1 The Framework of Four Basic User-Artifact Relations

The four basic relation models are developed by researchers in the fields of postphenomenology and Science Technology Studies (STS):

Embodiment Relations. The user can get different, mediated experiences from the world *through* the artefact [7,9] e.g., wearing the glasses;

Hermeneutic Relations. The user can get experiences and information *with* the artefact. For the user, it is about “reading a text from something” [7: pp 80-97; 9: pp11-13] e.g., reading the thermometer;

In *alterity relations*, users relate positively or presentially *to* the artefacts. In these relations, artefact becomes an ‘other’ or “quasi-other” as focal entities of the user’s experience [7: P107], e.g., interacting with robots;

Background relations, artefacts in these relations “remain in the background or become a kind of near-technological environment itself” [7: P108]. It is a ‘technosphere’ or becomes technological cocoons surrounding the user [7: P14], e.g., clothes, electric systems.

The imitation of these four relation models is that they are static, stable, and ideal conditions. They are the ultimate goals of the development of technology which will lead to harmony between human-technology-world. However, in daily life, when thinking about the relations of user-artefact, it is always in a use context, which is dynamic, with different types of relations. Thus, in a specific use context, the types of relation between the user and artefact may not be one, but several.

Based on these four models of user-artefact relations, we develop a coordinate system as the framework to show the user-artefact relations in a dynamic use context, see Figure 1. Point A as an example represents a condition. The four different models of user-artefact relation can be considered as the results of different types of interactions. Through different interactions, relations can be built and created.

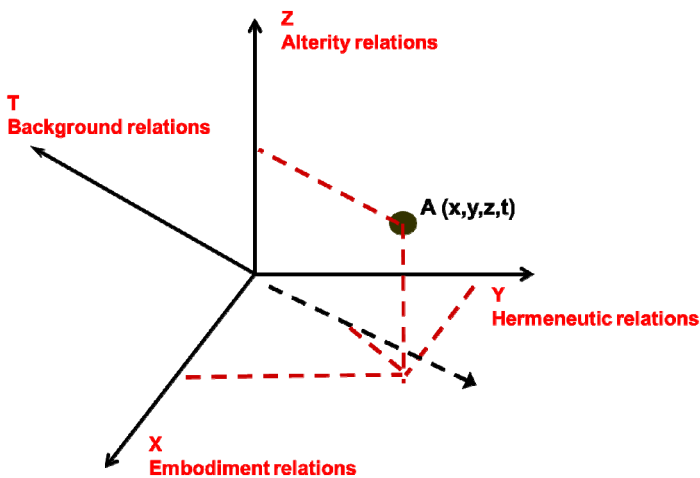


Fig. 1. A coordinate system of four relations

2 Case Analysis: The Village Phone Programme (VPP)

The case to be analysed is about renting the calling time in rural countries of Bangladesh, which is one of the poorest countries in the world. This programme becomes well-known because of the tiny loans to poor rural women, provided by the Grameen Bank². In so doing, the founder of the bank Muhammad Yunus, won the 2006 Nobel peace prize.

The Grameenphone, an offshoot of Grameen Bank, provides mobile phones for the buyers to be rented the calling time, which are called the Village Phone Programme (VPP)³. There are more than 100,000 people who buy the phones and then rent out the time [8]. Most Village Phone participants are women living in remote areas⁴.

For the Village Phones (VPs), there are two kinds of users: one is the phone's owners, who buy the phone from the Grameen Bank and sell the calling time. They are named as the Village Phone Operators (VPOs); the other is the local people, the users or potential users, who buy or will buy the service from the phone's owners [10]. The VPs also have three different conditions, which are making calls, incoming calls, and standby. The Bengalis people, the VPs, and the rural environment make the interactions between the different users and mobile phone more complex [11]. We shall apply our framework to analyse the case, to describe the user-mobile relations, and to show the interactions during the use context.

2.1 Making Calls

The caller and the receiver will get the mediated experiences *through* the mobile phone, when making calls. Their hearings are 'extended' [12] and magnified to hear the other's voices through the phone, and their attentions usually focus on the voice and conversation contents [13]. The relations between the users and mobile phones are embodiment relations. However, before the embodiment relations, the user should firstly know and understand how to use the phone, to have the ability to 'read' the phone. Their relations are hermeneutic relations.

In the VPPs, the VPs and communication services magnify the users' bodily-perceptual experiences, enabling them to communicate with relatives, family members, or business partners far away from the village, giving more opportunities to the villagers to know the outside world, and "make tremendous social and economic impact in the rural areas of Bangladesh"⁵. The VPOs also acquire the ability through training classes or the technicians' help to operate the phones.

If the mobile phone works well, the service is good, and the environment is quiet, there will be no difference of the space and time to the conversation. It is almost like to hear someone speaking near one of your ears, but in the case of the Village Phone

² Source: <http://www.economist.com/node/21543547>

³ Source: <http://www.grameenphone.com/business/packages-information/gpvp>

⁴ Source: http://en.wikipedia.org/wiki/GrameenPhone#cite_note-23

⁵ Source: <http://www.grameenphone.com/business/packages-information/gpvp>

Programme (VPP), the village phones (VPs) are used in a specific environment and used by different users (i.e. the VPOs and the buyers). Thus, there are two kinds of users in two different scenarios, one is for the VPOs, using the VPs themselves in their shops or homes, which is the same as the normal use of mobile phones as private products only for the owners; the other is for the buyers, other villagers paying money for the use of VPs, when the VPs are regarded as open resources and the shops as public areas.

The Calling/Using of VPOs. In the rural areas of Bangladesh, VPs are usually installed in the owners' small shops, nearby some small local markets. For the VPOs, when using the mobile phones by themselves, they can often find quiet places to get a better communication quality. The mobile phones become the means of communication, and are (semi-)transparent and withdraw into background during the calling [7:P24] [13]. The VPs extend the VPOs' experiences, while they also 'reduce' the users to voices, not the 'flesh' speakers with the absence of phone user's "multiple sensory dimensions of a face to face situation" [9:pp24-25].

Meanwhile, unlike the normal use of mobile phones, the VPOs have to make a short and quick call if they really need it, and then keep the VPs standby for renting or any incoming calls. Because the VPs in their hands are a mean of making money; they need to rent the calling time to customers, not only using by themselves. In this condition, for VPOs, the VPs become 'others' who can make money for them. The reduction and this alterity relation can change the VPOs' behaviours of using mobile phones, which are different from the face-to-face talking, e.g., it lets the VPOs speak fast to save time; worrying about the money let them become impatient with the people and conversations on the phone.

So the interactions between the owner and mobile phones lead to three kinds of relations: the embodiment relations, hermeneutic relations, and alterity relations, see the Figure 2. C1 in the figure represents Condition 1. Its coordinate is $(x, y, z, 0)$, which means in this condition, the user and mobile phone has three kinds of relations.

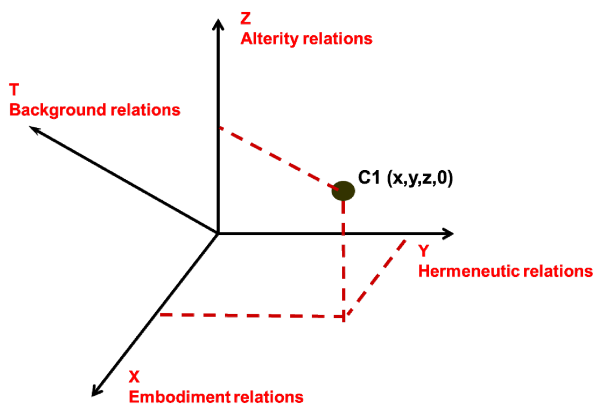


Fig. 2. The owner and VPs' relations when making calls

However, the two relations conflict each other: in embodiment relations, the VPs become the means of communication, and try to be (semi-)transparent and withdraw into background during the calling, while in alterity relations, the VPs turn to be focal entities of the VPOs' experience. For VPOs, this kind of contradiction happens in the whole using process.

The Call by the Buyers. For the buyers, because of the needs, they are willing to go to the shop where the VPs are located, and pay the calling time to make calls. The buyers' intentions lead to the interactions between the buyers and the VPs. In so doing, the VPs are experienced from absence to presence of the buyers' perceptions, from the background to the focal entities. The buyers' attentions will change from the mobile phones' appearance, shape to its performance and operation. At the beginning of the interaction, the VPs are 'others' for the buyers before being used. They are alterity relations.

However, the buyers' purposes are not to play with the VPs, but to communicate with other people far away from them. So the VPs quickly change their roles from 'others' to 'tools' and the relations are changed from alterity to embodiment. Besides, the buyers do not need to learn and know how to use the VPs. So in this condition, there are three kinds of relations between the buyer and mobile phone, see Figure 3.

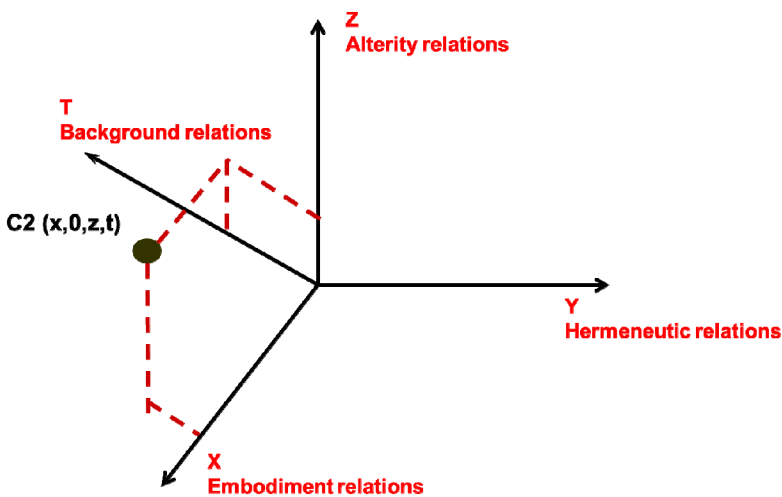


Fig. 3. The buyer and VPs' relations when making calls

When the buyers make calls, the relation is embodiment which is the same as the VPOs' calling. However, the two kinds of using contexts are different because of the different use constraints. When the buyers make calls, they can only be allowed to use the phones in the owners' sights, in case of stealing, robbery or any damages of the phone. If the buyers do not want anybody else to hear the conversation, the VOPs will offer the privacy through taking some measures to keep the VPs safe, e.g. using a hanging wire.

If the environments of the shop or rural markets are so noisy when making calls, it is difficult for the buyers to get a good communication through the mobile phones. They cannot hear each other clearly. It becomes a bad and ineffective interaction, not only with the people who they are talking with on the phone, but also with the VPs in their hands. The buyers will stop calling and the interaction will stop. The embodiment relations, which the buyers and VPs once build, disappear and the VPs thus become ‘others’ or “quasi-others” as focal entities. It turns out to be the alterity relations. This interruption for the buyers is a bad use experience, and cause a negative impact on the next time buying.

For the VPOs, the VPs in the buyers hands are ‘others’ for the VPOs, and they get the alterity relations. When the buyers make calls, the VPs cause them to concern the VPs and it changes their perceptions and behaviours. The VPOs have to pay more attentions to the VPs during the calling, making sure that the phones work well, the telecom’s services are good, and the buyers are just the buyers, not thief or robbers. They also have to change the behaviours to follow social etiquettes. When the buyers make calls, the VPOs should try to keep the environment quiet and make them unobtrusive in order not to interrupt or intervene in the buyers’ affairs [11].

2.2 Incoming Calls

The mobile phone is also a receiver to get incoming calls and messages. In this case, there are two different kinds of the incoming calls: one is for the VPOs, and the other is for the villagers. For the VPOs, it is a same procedure as the calls they make (see Figure 2). The phone’s owner will make short and quick answers if necessary and keep the VPs ready for renting or for villagers’ incoming calls.

For the villagers’ incoming calls, the VPOs will answer the phone and then have two options: One is to remember the important information of the calls, e.g., the callers’ names, calling time, contents, and then tell the villagers or tell them to call back; the other option is to stay on the line, and send someone, e.g., family members or other nearby villagers, to inform the villagers to answer the phone immediately. These two kinds of situations also depend on the contents of the incoming calls, whether they are emergent, private, important or not.

These two options lead to different relations between the owner and the mobile phone. The first is embodiment relations, and it is the same as they have the incoming calls. When the calls are finished, the VPs begin to standby and go to backgrounds; The second option leads to the alterity relations. The VPOs have to keep the call online, and wait for the villagers to answer the phone. They will care about the calling times, worry about the batteries and the services’ conditions. The VPs and services get the VPOs’ intentions and attentions, and become ‘others’ and focal entities.

2.3 Standby

When mobile phones standby, the interactions between users and mobile phones seem to disappear, but it is a new form of interactions and relations. With the VPs, the small shops and the whole villages are changed from the rural areas to modern technical

environments. The standby VPs, the services, and the communication systems are background relations to the VPOs and other local people.

For the VPOs, when there are no calls, the VPs are working in the background and become transparent for them. These background relations are non-continuous and can be easily changed to other relations, because the VPOs care about the renting times and how to make more money. They will check the VPs many times in a day, to make sure that the VPs are still working well, the services are good, and they did not miss any incoming calls. The VPOs usually hope that this 'silence' and the background relations can be broken and changed, either through the buyers or the incoming calls. The VPOs and VPs maintain a multi-stable relation during this process.

For other people in the village, including the buyers and the potential buyers, the standby VPs, the services, and the communication systems are not only a new way of communicating with other people outside the countries, but also a 'technosphere' surrounding them. They are add-ons and become part of their living environment whether they can perceive it or not. The VPs, services, and the system will keep absence, silence and transparency as backgrounds, before the villagers begin to think about them, talk about them, and use them. Thus, they emerge, appear and turn to focal entities, entering into the villagers' daily life as ideas to be thought about, topics to be discussed, and novel objects to be handled and used. The results of the interactions between the villagers and VPs are not only technical, but also entertaining and secular.

3 Discussions

The purpose of the VPP is on one hand to provide self-employment opportunity for the people in the rural areas of Bangladesh, on the other hand to let the villagers make calls easily and conveniently. Through using the framework, we analysed the relations between two kinds of users and village phones, and illustrated the dynamic interactions and multi-stable relations in the Village Phone Programme. It is clear that different use conditions have different interactions and relations which lead to users' and other stakeholders' different perceptions and behaviours. The users' experiences are mediated, while the VPs acquire the meanings during the using process, through the interaction with them.

According to our analysis, there are some problems in the Village Phone Programme which need to be improved:

This programme is not able to give more opportunities for the VPOs to 'read' the village phones. It is important for users to read various texts on the mobile phone, not only the short messages (SMS), but also the software applications. This kind of interactions will lead to hermeneutic relations between the user and the artefact.

In the VPP case, when there are no buyers at that time, there are many opportunities for the VPOs to use the VPs to send SMS to other mobile phone users or other VPOs. This information exchanges and social chats can give the VPOs more access to find new friends in a simple and easy way, and extend their social networks, or even build small communities.

There are two reasons for this problem: one is that the VPs' provider, the Grameenphone Company, merely provides one type of service and one single function of the phone; the other is the VPOs' lack of education and skills.

There are two potential solutions: for the provider, it can provide several VP models with different functions for the VPOs to choose. They can also improve the quality of the call, letting the VPs 'transparent and withdraw into background' through increasing the maximum of the handsets' volumes because of the noisy environment, adding the beep tone every minute when making calls to remind the user, finding ways to balance the buyers' privacy and VPs' safety, designing the VPs so that they are easy to use and maintain. They can also consult and invite the VPOs, the villagers to discuss and participate in the design process.

For the VPOs, building the hermeneutic relations requires basic knowledge of how to operate the system, type the words and send them to someone. In rural areas, there are many illiterates. This lack of knowledge and education lets the VPs rely heavily on technical professionals (most of them are male), "who are charged with keeping the phone systems operative and fixing malfunctioning equipment" [11].

Studies show that users, who have a long history with the mobile phone, or those who use mobile phones very often, can acquire strong habits. These habits develop users' new behaviours when using the mobile phones [13]. In this case, the VPOs behaviours are influenced and new social manners will be built through the calls not only by them, but also the buyers. For the governments or the communities, it is also a good chance and a new way to teach the VPOs and improve their education and technical skills through the use of mobile phones.

Building better relations and interactions can not only provide the poor people in rural areas the self-employment opportunity to earn money, but also give a chance for them to communicate with the outside world, to be educated and to acquire new skills.

Our framework proves useful in analyzing the complicated relations in the VPP case, and it has provided a new perspective of user-artefact relations, which we hope will inspire designers and innovators to better understand the user-product interactions and design according to different relations.

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