A Live Services Marketplace: Telepresence through Remote Humans

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Abstract: The basic idea is to use state-of-the-art telecommunication technology to implement the virtual presence of a person at a remote location. The concept is described with the use of modern mobile phones (smartphones), but several other devices with similar or extended capabilities could be used instead, including tablets and notebooks, action cams and augmented reality glasses (e.g. Google eyeglasses). The person, who wants to be tele-present somewhere (let's call this person the "pilot"), uses the smartphone to communicate with a person at the remote site (let's call this person the "flyer"). The contact includes an acoustic connection, i.e. they can talk to each other, and a video connection, i.e. at least the pilot sees what the flyer is doing. The Live Services Marketplace describes a business how to connect pilots with flyers. Flyers can register their willingness to act as telepresence avatars for selected tasks from a list of allowable tasks, maintained to prevent illegal tasks. Pilots can book these flyers through a central administration system, which searches for appropriate flyers, anonymises the contact and organizes the financial arrangement. The audio and video connection is live only (just as a phone call). The paper describes the basic concept and many use cases for this business.

1. Introduction

Often we want to be at some place for a short time, which is too far away or too complicated to reach within the available time or with the available resources. For example, managers lack the time to be everywhere they want to be, travel expenses do not permit people to visit places where they want to be, sick people simply are not able or allowed to visit some place, business or private obligations often prevent us from attending an event we want to be present at, some message makes us want to be somewhere else immediately, and so on. Other people at the remote site would be prepared to help for some compensation, but how shall we find them? The answer is to install an internet "Live Services Marketplace" (LSM) to connect such people. The person who wishes to get something done (the "pilot") specifies her/his demand, including the task, the place and the financial limits. Then the system tries to contact the best fitting person available who could perform this task (the "flyer"), to enable the flyer and the pilot to negotiate the conditions. To make this step fast and simple, standard fees for standard tasks are predefined by the system. A live video and audio connection is established that enables the pilot to communicate the exact task details to the flyer, and that gives live feedback from the flyer to the pilot about the progress of the task fulfillment. Furthermore the pilot may communicate with third persons at the remote site, e.g. to negotiate a business.

2. Technical Equipment

To create an appropriate connection between two people far apart, both need to have compatible devices. The high dissemination of smartphones, tablets and notebooks with internet access make this a welcome hardware platform for the first generation of the LSM. Additional hardware enhancing the telepresence experience, such as Google glasses and action cameras, can be added as they become widely available.

3. Registration

Before the use of the system, all users have to register at the marketplace. Information like real name, address, mobile phone number, payment options are registered with the LSM system. However, if a user wants to stay anonymous, none of this information will be given to anyone else, and only a defined user name will be used for all communication with third parties.

In addition, flyers have to define which tasks they are prepared to take over by selecting from a long list of all allowed tasks. If at any time a flyer or a pilot wants to request a task not in the list, they can do so, but will have to wait for a moderator approval. Once approved, such new tasks will be added to the list and are henceforth available to all users.

4. Connection

When a pilot wants some task to be done at a remote site s/he lets the system search for a flyer near the task site who is willing to perform this kind of task. The potential flyer receives an offer and may decide if s/he is prepared to accept this mission. If the offer is accepted, the pilot and the flyer have to negotiate the final conditions of the deal. If the offer is not accepted, the system will search for the next best fitting flyer, and so on.

5. Communication

Both partners have devices enabling live audio and video transmittance. The main communication channels are the video signal from the flyer to the pilot and the audio signal from the pilot to the flyer. In this way the pilot can direct the flyer to do what s/he wants to be done and gets video feedback of the result. Of course, further channels such as an audio feedback from the flyer to the pilot and a video signal from the pilot to the flyer help to set up a more flexible connection. Communication includes descriptions of the tasks to be done, as well as negotiations about the paying conditions, control commands where and in which direction to place the camera, video and audio communication with third persons, any further agreements, and so on. The pilot shall be able to make the flyer act instead of her/himself as if s/he were personally at the remote site. This is called a telepresence experience.

6. Accounting

Each allowed task has a default value, i.e. a price paid by the pilot to the flyer for undertaking that action. It is also possible for costumers to agree on other prices. All money flow is performed by the LSM system, hiding any account information of the partners from each other. A small percentage is added to each payment to finance the LSM system itself. Additional money transfer options are included to enable the payment of businesses with third parties.
After the completion of a task, both sides are asked to rate the other side, just like this is usual in other internet marketplaces. A mediation mechanism shall resolve unfair or too rigorous ratings.

7. Use Cases

The description of a few use cases shall make the concept more comprehensible and demonstrate its usefulness.

7.1 Holiday Hotel Reservation

Suppose you want to book a hotel in a place far away, and the only information you have is from the internet, where the hotel displays a few well selected images and you find a few (possibly fake) ratings. Before you actually book this hotel for yourself and your family you can visit it virtually. So you book a flyer at the hotel destination, asking her/him to go to the hotel and walk around with the camera. You can see live all parts of the hotel that you want to see by directing the flyer accordingly. You can communicate with other guests about their experiences. You can negotiate with the registration about prices, available rooms and extra wishes.

7.2. Second Hand Car Purchase

Suppose you find a rare vintage car that you are interested in for sale in a city far away. To inspect this car you can make a virtual visit to the seller. You book a flyer in the vicinity of the car and ask her/him to visit the car seller. There you can look at all details of the car, negotiate with the seller, and eventually even buy the car by transferring money through the LSM system.

7.3 Remote Cemetery Visit

Suppose the anniversary of the death of your grandmother makes you want to bring some flowers to her grave and light a candle there. Unfortunately her grave is hundreds of kilometers away and you have only restricted time. With the LSM you can book a flyer near the cemetery and ask her/him to arrange the things as you wanted them. Your virtual live presence will give you the certainty that it really happened, and will let you take part in the small ceremony for your grandmother as if you were there.

7.4 Virtual Control Visit

Suppose you have a weekend house a few hours away. Some message, like a very bad weather report or the activation of an alarm, makes you want to control the situation immediately. You can simply book a flyer in the area of your house, ask her/him to drive there and let you be there virtually to control whatever you want to see. In most cases this will be sufficient to see that everything is o.k.

7.5 Further Use Cases

Many further use cases can be thought of. Any place you would like to be at for a short time, but want to avoid the travel overhead for time or financial or any other reasons, you can visit virtually through the presence of a human avatar. Often this will be faster and cheaper and sufficient. On the other hand thousands of people have spare time and are prepared to help others for some compensation. This may include visiting people in hospitals or nursery homes, participation in meetings, snow removal at some place, testing any service somewhere, performing small jobs, guiding a sightseer, translating, virtual presence at various events and many others.

8. Implementation

Currently no internet service is known to the authors that enables this functionality. The prediction is that soon numerous specialized services for subtasks of the described use cases will be online. Our vision is that one unified marketplace for all similar use cases can make the concept popular enough to integrate this business naturally into our daily life, actually to revolutionize many aspects of life. The first prototype implementation works on smart-phones under Android. For the video communication an open source system is used to enable sufficient control over every aspect. Communication content is not stored unless wished so by the users.