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A Framework for Talk Value Transfer among Diverse Mobile Service Providers

K Jayanth Kumar[1], M Vinvith Kumar[2], Selva Rani B[3] and Vairamuthu S[4]

[1,2] MS Software Engineering, [3,4] Senior Assistant Professor,
[1,2,3] School of Information Technology and Engineering,
[4]School of Computing Sciences and Engineering, VIT University, Vellore.

Abstract

Mobile money transfer is a way of sharing the available talk value from one mobile to other mobile. This service is useful when our family members or friends are in a situation in which they cannot recharge their talk value in mobiles. Currently this has been implemented between two mobiles which belong to the same network. In this paper, we have proposed a method to transfer the talk value from one mobile to another mobile which belongs to a different network. Both the networks of the sender and the receiver could be benefited through a predefined commission.

Keywords: mobile networks, service providers, talk value.

1 Introduction

Sir Arthur C.Clarke, a science fiction writer in one of his essay (in 1959) foretold that every man would be going to carry a compact personal transceiver by which human being would be able to communicate a person any time and from anywhere on the globe by merely dialing a number. As he told mobile phones, which are handheld devices started dominating the communication field all over the world. Cordless phones which are of same size as mobile phones can be used within a small range of area. In contrast, with the help of cellular networks, mobile phones are able to make/receive calls even in mobility in a broad geographic area. Initiated by Motorola in 1973, the history of mobile phones shows that massive types of mobile phones have been produced and it becomes an unavoidable appliance with each and every one. The usages of mobile phones are very vast viz. money transfer, travel ticket booking, online purchase/sell of goods, surfing the web, entertainment, etc. Every

user gets a unique mobile number and every mobile network has a unique bandwidth for communication.

The talk value for a mobile number of a user can be obtained by choosing the scheme by the user, either post paid or pre paid. In pre paid scheme, once the talk value exhausts, the user has to recharge his account by paying the money in person or through online recharge for his/her mobile number. Recently, mobile networks came up with an idea of transferring the talk value of one user to another user who may be known to him. This scheme permits the talk value transfer between two users of the same mobile network. While transferring, the talk value would be reduced from the sender's mobile number and the same would be added to the receiver's mobile number with the predefined service charge to the mobile network. In this paper we are proposing a new idea to transform the existing system by providing a way of talk value transfer between two mobile numbers of different mobile networks. By this initiative, both the mobile networks will be benefitted by an agreed commission.

2 Related Works

Mobile phone is a device which is highly used all over the globe in today's day to day life. This usage of mobile phone crossed the issues of communication barrier among people [1]. This paper explained about phone usage characteristics with security issues and how a user feels towards the monthly bill by some statistics. These were obtained by 1712 questionnaires from 17 universities of 10 eastern and southern Europe countries. From the marketing point of view, they observed an efficient outcome about security. Most of the people who had under gone these questionnaires felt that this mobile phone communications are moderately secure in spite of having many unequal categories of bills.

At present updated technology mobile phone is one of the leading communication medium through which many of them are benefited. In two cities of Oman they had conducted a survey among 200 students using questionnaires and interviews to check efficiency and usage. This was done under the basis of mobile phone usage. They realized that they hit 100% involvement in mobile adoption and mobile technologies. In mobile usage point of view they inferred that most of them prefer to use prepaid connections [2]. One more specific truth which was observed through these questionnaires and other methods are that they have higher tendency and buy top end mobile phones.

Now-a-days internet applications are frequently accessed in mobile devices. This can be obtained by providing limited bandwidth and unreliable wireless channels. The problem occurred due to this kind of provision is long delay. To accelerate this content delivery many solutions have been proposed by comprehensive survey of most relevant research activities. They initially investigated about network measurements, and network obstacles, which dominate content delivery delays [3].

Finally they classified content delivery acceleration in mobile acceleration in mobile networks into 3 categories:

- Mobile system evolution,
- Content and network optimization,

- Mobile data offloading providing with overview of available solutions altered for web and multimedia deliveries also.

People want to keep on increasing their quality of life and technology. Money transfer between two mobiles is a difficult task embedded with many risks. To overcome this kind of issue, near field communication is a new secure short range wireless connectivity technology. In future, with in updated technology this NFS contributes to simplify some daily operations, such as payments and money transactions [4]. This paper focused on NFS technology and proposes a peer-to-peer based applications that demonstrate the usage of NFC and Bluetooth technology for transferring money between two mobile devices.

This article proposed an idea which is mainly beneficial to the poor. In this they are introducing the usage of mobile phones among these people so that if they can deposit their money in their account, it will be helpful to them in case of security and even they can be benefited by provide loans based on that money [5]. Even if they want to give money to others they need get them to hand and give it but can transfer to their respective account.

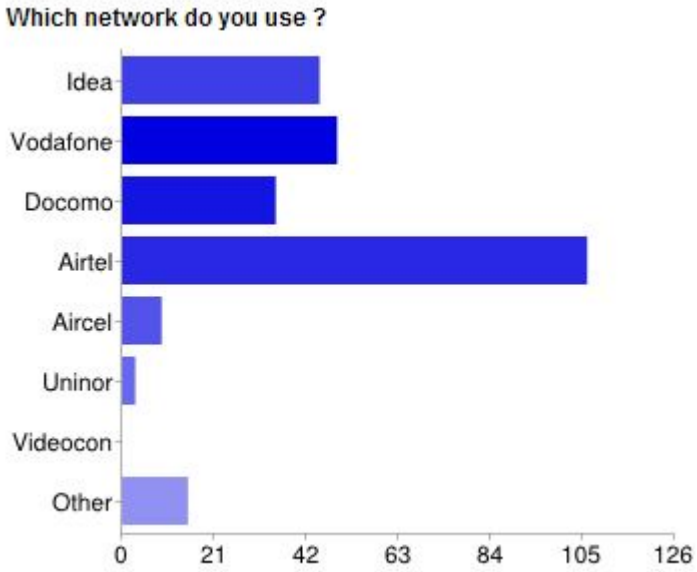
This article explains about their new way of securely transferring money from one phone to other phone by a technology called Near Field Communication [7].It is a set of standards for smart phones and similar devices to establish radio communication with each other by touching them together or bringing them in to proximity. Communication is also possible between an NFC device and unpowered NFC is called a Tag which even gets implemented through Bluetooth devices to do any simple household jobs also. This technology even plays a major role in authentication. So this proposal was totally concentrating on efficient implementation of Near Field Communication technology.

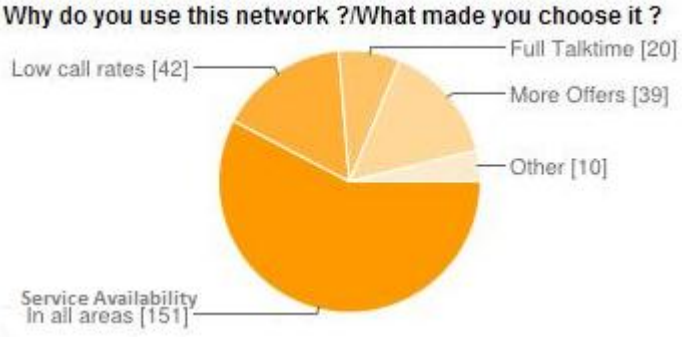
This article describes all about the easy and efficient way of data exchange through XML on java platform. The reason behind this particular choice of XML and java is, XML is widely accepted and java platform has a high level of portability. This can help port to any other required platform accordingly.[8]

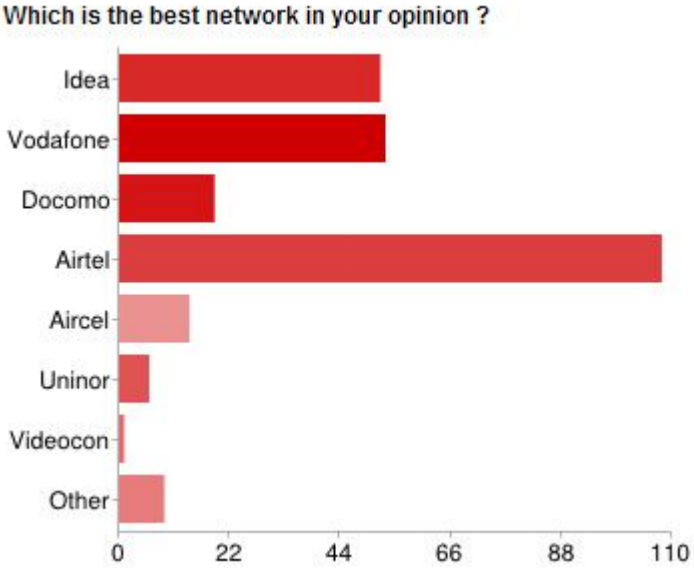
3 Field Investigations

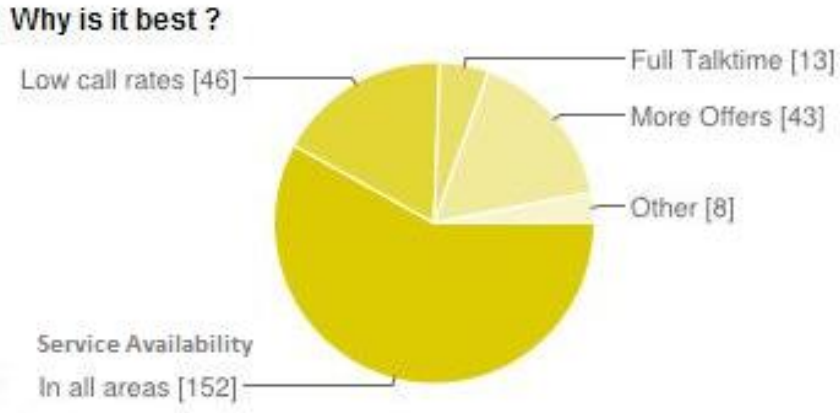
We carried out a small investigation among the students community of our university to make sure about the awareness with the about this mobile talk value transfer. The questioner include the type of the mobile service provider the students are using, the reason for their choice of the mobile service provider, the best service provider in this area, the reason and the awareness about the talk value transfer in mobiles.

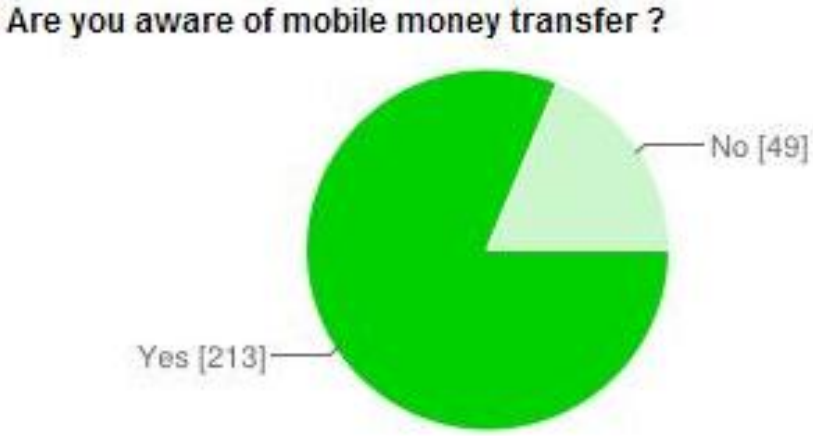
We have provided some of the snapshots of our survey obtained using *Google forms*.

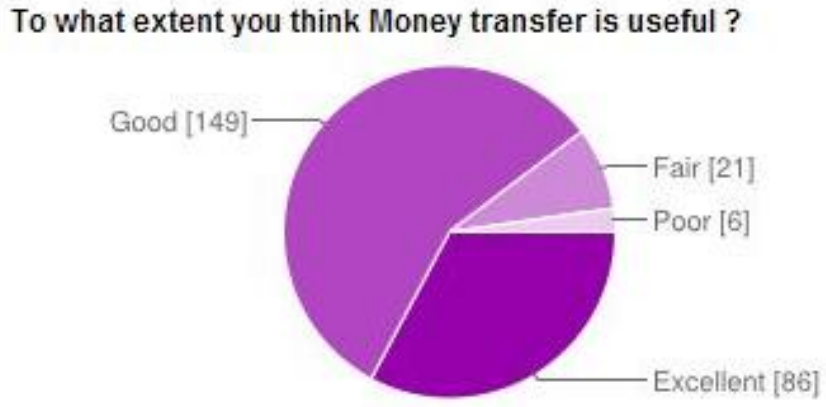

Which network do you use ?
Idea
Vodafone
Docomo
Airtel
Aircel
Uninor
Videocon
Other
0
21
42
63
84
105
126


Why do you use this network ?/What made you choose it ?
Low call rates [42]
Full Talktime [20]
More Offers [39]
Other [10]
Service Availability
In all areas [151]

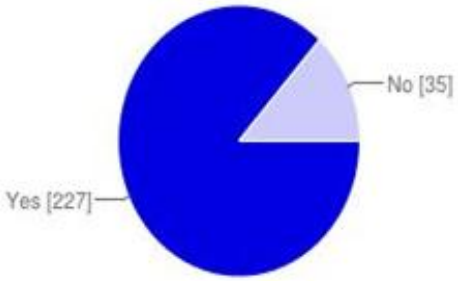

Which is the best network in your opinion ?
Idea
Vodafone
Docomo
Airtel
Aircel
Uninor
Videocon
Other
0
22
44
66
88
110


Why is it best ?
Low call rates [46]
Full Talktime [13]
More Offers [43]
Other [8]
Service Availability
In all areas [152]

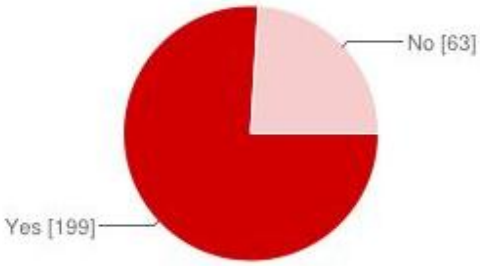

Are you aware of mobile money transfer ?
No [49]
Yes [213]


To what extent you think Money transfer is useful ?
Good [149]
Fair [21]
Poor [6]
Excellent [86]

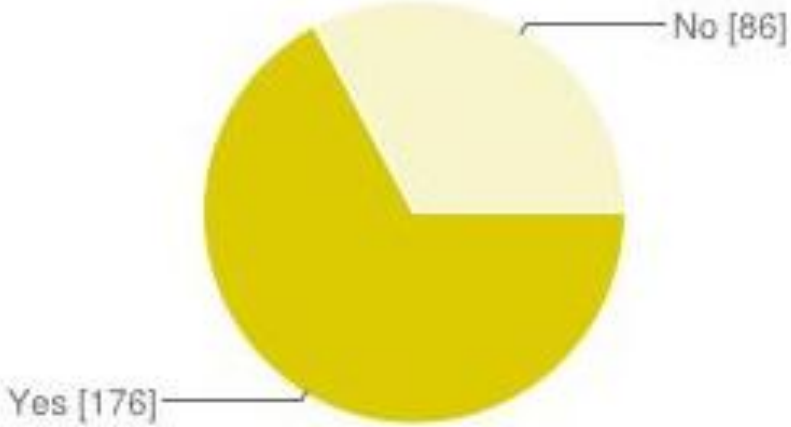
Then do you think Money Transfer between different networks is useful which is not available now ?

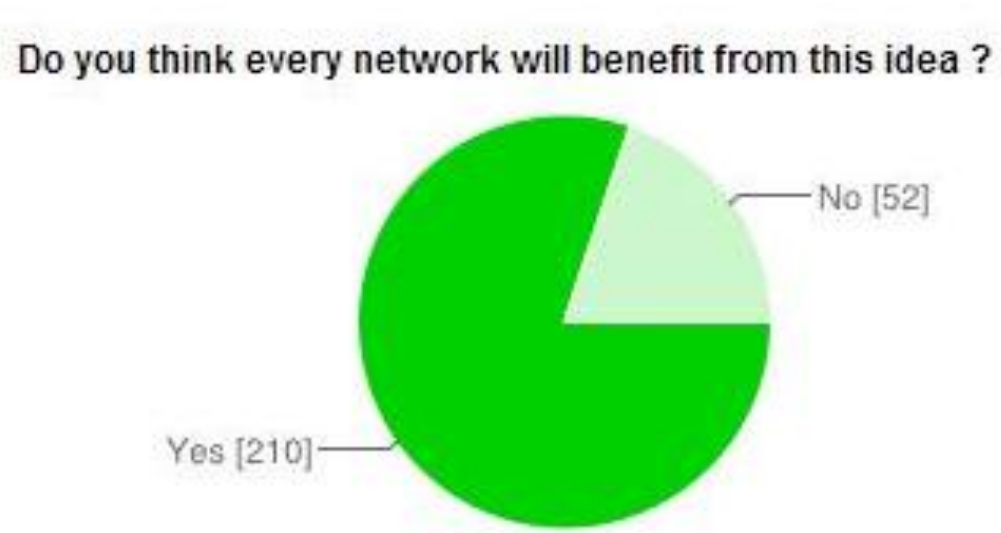


Do you think this idea(Money transfer between different networks) is useful in every situation?



Do you feel majority of networks will opt for this idea ?





4 Existing System

4.1 Description

Currently, the feature of mobile talk value transfer is possible between two mobile numbers of same mobile service providers. A particular mobile network provides a toll free number to its users, to which they need to call for transferring the talk value. Once entering the amount to be transferred and the mobile number to which the transfer has to be done, the receiver's mobile balance will be updated with the amount mentioned. From sender's account, the amount transferred along with a processing fee will be reduced.

4.2 Existing System Architecture

We have provided the existing system architecture of mobile talk value transfer between the prepaid users of similar Mobile Service Providers *(MSP)* in Figure 1. In the existing system, the sender, *'S',* has to dial *USSD* code as specified by the service provider of his/her mobile network or he/she has to send a *SMS* to the *MSP* following the mobile number *'M_R'* of the receiver *'R',* and the talk value *Talk Value* to be donated. If sufficient balance is available with the sender's account, the amount *Talk Value* along with the processing charge predefined by the *MSP* would be deducted and the *Talk Value* would be added to the receiver's account.

If there is no sufficient balance it would be indicated to the sender *'S',* and the request could not be completed. Since this task is carried out between the users of the same mobile service provider, there is no need for authentication, validation of the mobile numbers of both the sender and the receiver etc.

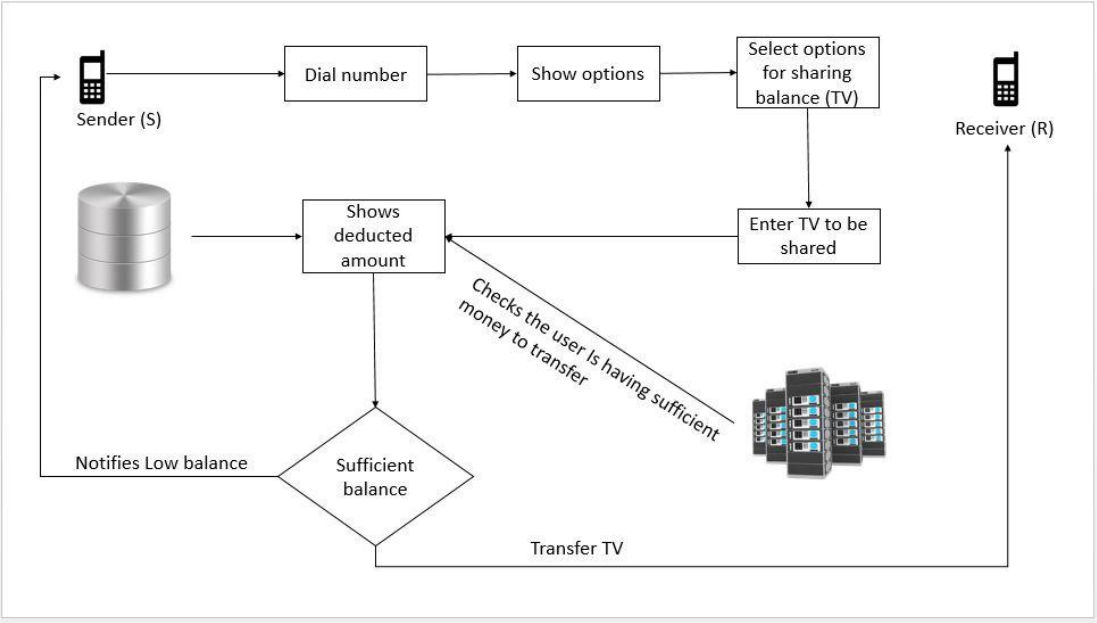


Fig.:1 Talk value transfer between users of similar service providers

4.3 Limitations in Existing System

The current scheme of transferring the talk value among the mobile users is limited to the following points:

- Sender should have a minimum amount *Rs'.x*' even though he/she wishes to transfer an amount *Rs.'y'* which is very less.
- Sender should register for transferring talk value every time.
- Post transfer balance should be some *Rs.'x'*.
- There is a restriction in number of times in transferring the talk value per day.

5 Proposed System

5.1 Description

In this paper we have proposed an idea of mobile talk value transfer between the users of two different service providers. The main objectives behind this proposal is providing

- authentication between the sender and the receiver
- secure communication between the server and the users
- talk value transfer between sender and the receiver of different mobile service providers

Initially, sender *'S'* has to login to the portal at which he/she has to enter his/her mobile number, 'M_S' and the receiver's mobile number, *'M_R'*. Server receives this request and check for the type of the mobile network service providers of both sender and receiver, say *'MSP_S'*and *'MSP_R'*. Since there should be a prior negotiation between the various *MSP*s, server verifies the existence of both the *MSP*s. If this step

is successful, server generates a one-time password *(OTP)* and sends to the sender '*S'*, which has to be submitted by the sender again to the server. Then, the sender will be prompted for the amount say *Rs.'v'*, for which the talk value has to be transferred to the receiver, '*R'*. The server displays the processing fee say *Rs.'p'*, for transferring talk value to the sender. It also checks the available balance in sender's talk value. It should be greater than the talk value to be transferred along with the negotiated processing fee for both the sender's and receiver's mobile service providers. If balance not available it will be intimated to the sender who submitted the request for talk value transfer. If sufficient balance is available, receiver receives a message indicating that the sender '*S*' requested to transfer the talk value for *Rs.'v'* to his mobile, once he agreed to receive, his account in his mobile service provider will be updated with an amount *Rs.'v'*. The receiver's service provider will also be receiving the processing fee for updating the receiver's account. In sender's account in his mobile service provider the total amount, the amount requested for transferring the talk value along with the processing fee for both the providers will be deduced.

5.2 Proposed System Architecture

We have given the architecture of the proposed system of mobile money transfer (talk value) between dissimilar service providers in Figure 2. Initially, all the *Mobile Service Providers* should have a negotiation about the talk value transfer, the processing fee for both the service providers (sender and receiver), the maximum number of times a sender could donate the talk value and any other issues related to the transfer of talk value. As in the existing systems, here also we propose the money transfer between the prepaid account holders. Validation of the mobile numbers, balance checking and deduction of talk value and processing fee are done as depicted in the following figure.

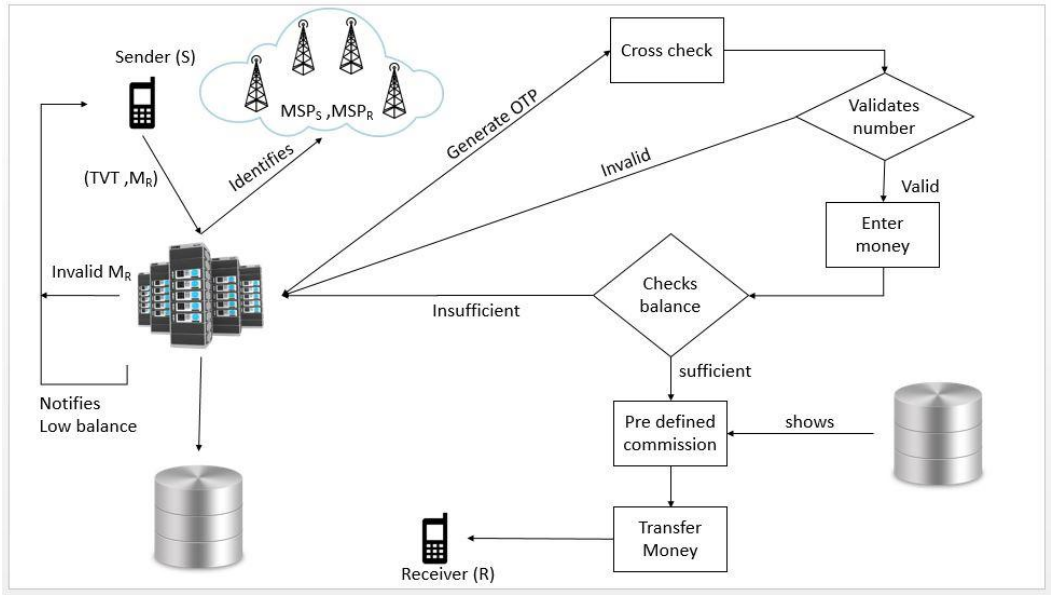


Fig.:2 Talk value transfer between users of dissimilar service providers

5.3 Pros and Cons

In our proposed framework, if a particular donor is continuously transferring talk value to his/her friend/relative, who belongs to a dissimilar *MSP,* there is a chance of loss for the receiver's *MSP.* To avoid this, there might be a negotiation between the *MSP*s regarding the maximum number of times of talk value transfer. Continuous talk value transfer requests in the same month might be permitted with an increase in processing fee. Based on such compromise between the various *Mobile Service Providers,* this proposed idea would definitely become a useful facility to the users of diverse mobile networks.

6 Conclusion

In this paper we initiated a new spark by making a little change in the existing system because at present we have mobile talk value transfer facility between the users of similar service providers like Airtel, BSNL, Vodafone etc. The main advantage of this proposed system is in case of any emergency, to whatever service provider the users are connected with, they would be able to transfer the money (talk value) from one network to the other network. We would like to continue this work in future, to develop an application for making the mobile talk value transfer easier between the users.

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