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# Method to Provide Mobile Signal when the Network Provider Has Failed

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**Abstract:** *Mobile communication plays a vital role in every human's life. The basic requirement to initiate this communication is a mobile signal. A mobile signal, which is also known as reception, is the signal strength received by a mobile phone from a cellular network. This signal is detected by the SIM (Subscriber Identity Module) card that is inserted into the phone and helps to send and receive calls/text messages. Various network (signal) providers include Airtel, Vodafone and BSNL etc, whose primary goal is to facilitate their customers with their best reception. But, at the situations where the signal vanishes, the network subscribers (users) become helpless.*

*In this paper, we suggest a method which helps the subscribers to gain signal from other network providers, in case of emergency situations, when their own network provider has failed. This is implemented by making changes in the ICCID (Integrated Circuit Card ID) of the SIM. By implementing this concept, we can also provide signal to those subscribers in the dead zones of a particular network, where a dead zone is defined as an area in which mobile phones cannot transmit to a nearby tower or a base station.*

**Keywords**: *Reception, Network, SIM card, ICCID*

## 1. INTRODUCTION

A mobile phone sends and receives information by radio communication. Radio frequency signals are transmitted from the phone to the nearest base station and incoming signals are sent from the base station to the phone, at a slightly different frequency. Base stations link mobile phones to the rest of the moving and fixed phone network.

Once the signal reaches a base station it can be transmitted to the main telephone network, either by telephone cables or by higher frequency radio links between an antenna (e.g. dish) at the base station and another at a terminal connected to the main telephone network, represented by Figure 1. [1] Thus the communication takes place.

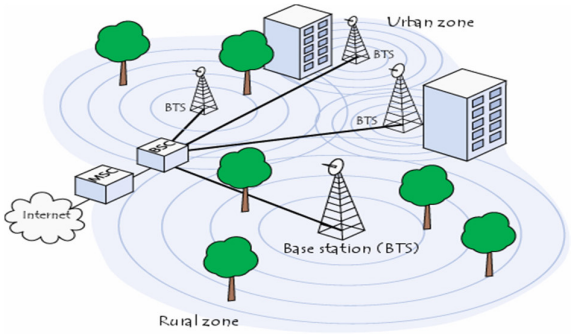


Figure 1: Communication using base stations



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## 2. Problem Statement

"Communication becomes difficult for the network subscribers when their corresponding network provider's reception is unavailable."

In remote areas or situations like train journeys /disastrous incidents/ emergency bearings, the signal of some network providers may stay strong while others may become inaccessible, giving distress to the subscribers. Hence, the ultimate aim of provisioning the mobile users with uniform, endless and satisfying signal strength goes in vain.

## 3. Role of SIM Card

SIM's are small cards which contain a chip that must be inserted into GSM (Global System for Mobiles) phones for those phones to work. A GSM phone will not be able to receive any mobile network without a SIM card. [1] This card is important since it holds all of the critical information, like:

1. **ICCID = Integrated Circuit Card Identifier:** This is the identifier of the actual SIM card itself - i.e. an identifier for the SIM chip.
2. **IMSI = International Mobile Subscriber Identity:** This is the identifier of the user of the cellular network and is unique.
3. **MSISDN = Mobile Station ISDN Number:** This is the full phone number of a subscriber. It allows a device to be called. [2]

## 4. Solution Identified

We hereby provide a solution to this problem by making alterations in the ICCID code of the SIM card.

### 4.1 Introduction TO ICCID

Each SIM is subjected to a unique ICCID (Integrated Circuit Card Identifier) code which helps in identifying a particular SIM card, as shown in Figure 3. ICCID's are stored in the SIM cards and are also printed on them during the personalization process. A full ICCID is of 19 to 20 characters.

The format of ICCID is
MMCC IINN NNNN NNNN NN C x,
MM = Constant
CC = Country Code
II = Issuer Identifier
N {12} = SIM number
C = Checksum calculated using Luhn Checksum Algorithm. [5]
Example: 89914 00000 07027 90060

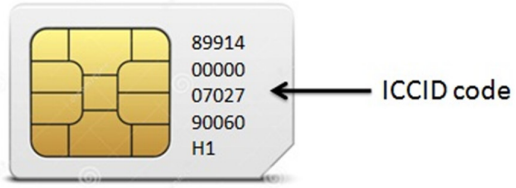


Figure 2: Normal ICCID in a SIM card

### 4.2 Working OF ICCID

Any SIM card gains mobile signal only through its ICCID code. It is possible to change the information contained on a SIM (including the IMSI), but the identity of the SIM (ICCID) remains the same. We know that the mobile signals are transmitted in the form of radio waves via transmitter. Once they are transmitted, they reach their corresponding subscribers through this code, i.e.) the ICCID sends an alert to the transmitter that there is a subscriber who is yet to access the signal. If the transmitter finds the ICCID as a valid one, the subscriber then receives the mobile signal and turns capable of sending and receiving calls or text messages. Once this is done, IMSI

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identifies the SIM card's user details and MSISDN identified the phone number associated with that SIM. Thus, all the primary information is obtained.


Figure 3: Steps undertaken to connect to a signal

### 4.3 Solving the Problem

Since the ICCID is a unique code, it allows the SIM to access only to its corresponding network provider of a user. Let 'A' be the corresponding network provider and 'B' be other network providers.

But in situations where 'A' becomes unreachable, how will the subscriber receive the signal? Hence, we bring a solution to this where we suggest adding a second ICCID code to the SIM card which will help the subscriber to access 'B' when 'A' is unreachable. The first ICCID code in the SIM has higher priority and is designed to have preference to the main network ('A') used by the subscriber, and second ICCID code, with lesser priority, is made open to other networks ('B') available, pictorially represented in Figure 4.


Figure 4: Modified ICCID code

At a point where 'A' becomes unreachable the mobile asks permission from the subscriber if it can go in search of 'B'. If a yes is received as response, the subscriber is connected to the nearby 'B', for which the particular cost will be included in bills. If a no is received, the user will still remain unreachable until 'A' regains its strength.

Deals/tie-ups between various network providers would bring profit to the business where they decide methods to transfer the money, a particular subscriber of 'A' has used for 'B'. As networks are shifted, the information will be stored in the SIM. It will come to the notice of 'A' and they will either transfer the amount to 'B' immediately or as a total in the end of the month.

## 5. Practical Application

Consider a situation where you are stuck alone in a disastrous incident and there is no mobile signal of your network provider, which makes you unable to dial calls. Technically, this means that your ICCID number is not recognized by the transmitter.

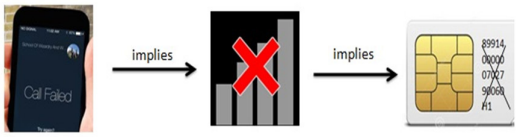


Figure 5 (a) Failed call

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In this situation, your mobile phone beeps a notification asking if you would wish to connect to other nearby networks available.

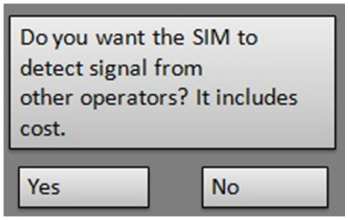


Figure 5(b) Mobile phone requesting permission

Once you press the yes button, your SIM starts searching for other signals. Technically this means that the second ICCID code is trying to get recognized by nearby transmitters of other network providers and the signal with high frequency gets connected, if available, helping you to contact others for help.

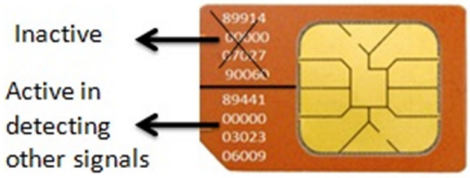


Figure 5(c) Second ICCID working to get signal

This complete process is depicted in Figure 5(a) to Figure 5(c). The shift of network will be stored in your SIM along with other details like contacts which is already present inside it. It comes to the notice of your network provider in the end of the month in case of postpaid for which money will be paid separately, and the balance is reduced and transferred to other network provider immediately in case of prepaid.

## 6. Conclusion

"Communication works for those who work at it", said by John Powel, favours this paper. Increasing the frequency of signal gives satisfaction only to those who can access it, but sharing the signal gives satisfaction to those who have not even imagined of accessing it. Such implementation gives a handover during any calamities like floods, cyclones or train travel or to those located in remote areas where seeing the red light in all towers is a boon. Helping people to contact others at any point of time, this idea also serves as a profit in business to various network providers.

## 7. References

1. "Study on signal transmission performance of microwave multi-chip modules interconnect via hole structure", Wu Zhaohua, Electronic Packaging Technology and High Density Packaging (ICEPT-HDP), 2012 13th International Conference Pages: 1352 – 1356.
2. "A statistical model of mobile signal reception Malkan, M. Universal Personal Communications", 1994. Record., 1994 Third Annual International Conference, Pages: 150 – 154.
3. "Mathematical Investigation and Analysis of Regional Signal Coverage in Mobile Communication", Zhiming Qu; Lijun Jiao; Libo Liu Computing, Communication, Control and Management, Pages: 385 – 388
4. http://www.ofcom.org.uk/static/archive/ra/topics/mpsafety/school-audit/mobilework.htm
5. https://www.quora.com/What-is-the-difference-between-ICCID-IMSI-and-IMEI-numbers
6. http://www.makeuseof.com/tag/why-do-cellphones-need-a-sim-card/
7. http://www.pongcase.com/blog/cell-phones-work/#sthash.rsHMU5mG.b2KyCjeo.dpbs

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