

# SIM cards with embedded WiFi, applications and commercial models

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## Background

The integration of a WiFi hotspot onto a standard mobile phone SIM card opens the doors to many new applications. However, is this technology for technologies sake, or is it a groundbreaking innovation?

## Technical Innovation

The mobile telecommunications industry recently announced a fascinating development: the integration of a WiFi hotspot inside a standard GSM SIM card. The entire WiFi hotspot including antenna have been integrated into the tiny 25x15x1mm SIM card. When inserted into a normal GSM phone, the SIM card uses SIMtoolkit to access the data bearers (like GPRS, EDGE, HSDPA, etc) available on the phone. Hence creating a WiFi hotspot around the phone. Admittedly, range is limited (metres rather than a hundred metres), but this technology offers the potential of accessing the internet from your WiFi enabled netbook using a standard mobile phone.

## Origins of the technology

This technology was originally conceived by Telenor, who were at the time investigating solutions to locate mobile phones with a high degree of resolution within buildings. They used a WiFi access node integrated inside a SIM card to report back the WiFi cells in range, hence determining the mobile phone's approximate position. Telefonica, working with the SIM vendor Sagem Orga (Morpho) recently launched the SIMfi, as a commercial product.

## Potential Applications

The question which remains unanswered is, is this technology for technologies sake, or is there a real commercial model underlying this technology. There are a number of potential applications, for example, effectively using the WiFi link to replace a cable (tethered connectivity) to enable laptops to access the internet. For accurate in-building location. Or, for the creation of millions of moving WiFi hotspots to

provide a data network backhauled using the mobile network.

## Alternatives and limitations

Many mobile phones with high speed data capabilities (or smartphones) already have integrated WiFi capabilities. The traditional SIM interface has a comparatively slow data rate. Use can be made of other faster SIM interfaces (such as the BIP interface), although not all handsets support it (particularly legacy handsets).

## Commercial Models

Successful technology needs a successful business model; it is insightful to consider each of the applications to determine their potential for commercialisation.

Personal WiFi hotspots (an alternative to tethered connectivity): there are lots of alternatives and substitutes for this application. For example, the laptop make have an integrated mobile broadband modem, or the user may have a broadband dongle. The user may have a USB cable for the phone (e.g. iPhone tethering). There may be public WiFi access available. However, the user may wish to take advantage of an inclusive data bundle available from the mobile network operator (MNO). Whether or not this is in the commercial interests of the MNO is questionable. Today, MNOs have serious Quality of Service (QoS) problems caused by the overloading of their networks by broadband data users.

In building location applications: Locating a mobile phone within a building can be very difficult. Using standard radio triangulation and time of arrival techniques can prove unreliable because of the reflection of radio signals within the in-building environment. GPS systems tend not to work within buildings. Hence, the use of a WiFi based solution appears feasible, in buildings with lots of WiFi nodes. However, the commercialisation of this application is more difficult to determine. How will the MNO gain additional revenues from offering this service?

Emergency services legislation (911) in the United States required cellular carriers to deploy extensive automatic location technology with specified degrees of accuracy. Similar requirements from the European Union could see this technology being required. Although, of course such technology could save lives and hence be invaluable, the costs of its deployment would be passed on to consumers through higher tariffs.

If every SIM card were to act as a WiFi hotspot, one would quickly build a universal WiFi network with near ubiquitous coverage. Provided you were located in a busy area, the chances of someone acting as a WiFi hotspot within 10 metres of you would be quite high. On the surface this would appear to be a very low cost method of quickly building a massive WiFi network. However of course, a WiFi signal could not be guaranteed. It would come and go as WiFi enabled phones happen to pass by, most likely leading to user frustration. Perhaps the biggest fundamental problem is that MNOs are trying to shift traffic in the other direction (i.e. off the mobile networks) because of the serious QoS problems they are encountering.

## **In Summary**

This is a fascinating technology with many applications however further work is required to identify the successful commercial model.

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We work with mobile operators, vendors and organisations throughout the mobile value chain from retailers through to equipment suppliers.

We have analysed and enhanced the value system for many different parts of the telecommunications industry. We often provide due diligence reports and in-depth market research for those contemplating a significant transaction or market entry strategy.

Piran Partners' founders are industry veterans with over 20 years experience each of the TMT industry. We pride ourselves that all our partners and associates are carefully selected based on their proven practical experience in the industry. Piran Partners is a member of the TMforum.

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