



MANGO

Mobile audio-video to go

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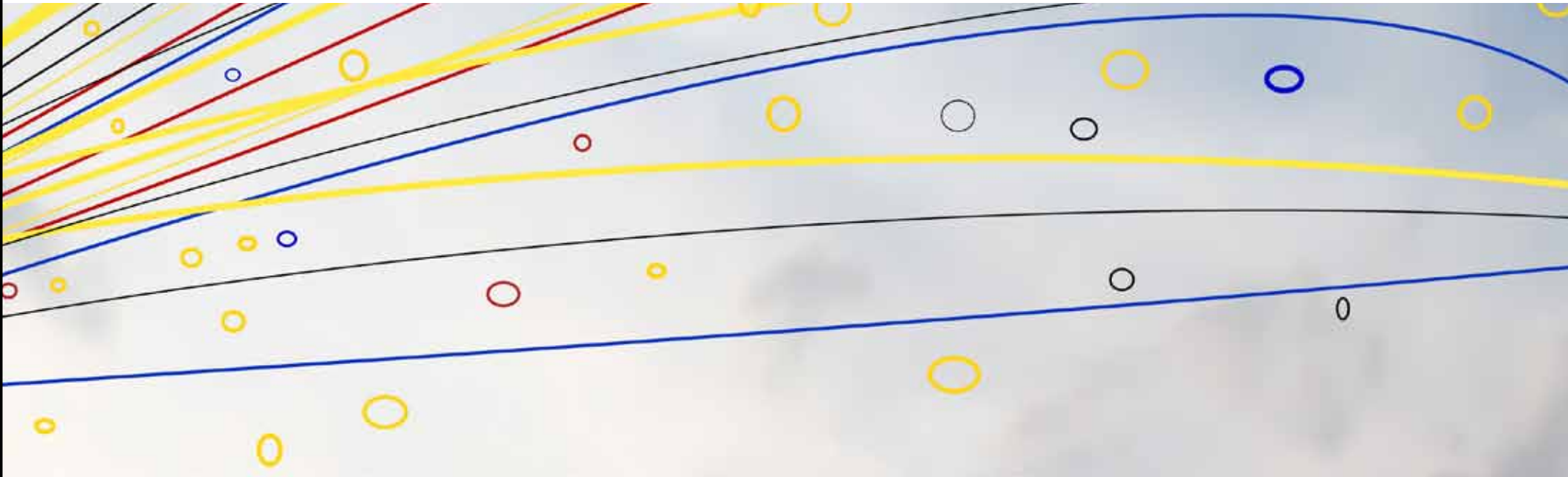
..... Alcatel-Lucent





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Project Profile

Mango is a novel service that enables rich content delivery over hot-spots to a mobile phone.

The mango service has two components 1) a large scale network of caches each with a fixed-line (or 3G) backhaul, and a radio front end (currently Bluetooth, which can evolve to Femtocells) for communicating with mobiles 2) an easy to use applications for phones that allows user to browse/share/search/download content.

Users install an app on the phone, and through a simple menu select content for download, upload or sharing. Then, in order to actually transfer content to and from their phones, users visit or opportunistically connect with mango hot-spots. The hot-spots are short-range cells (installed in shops, cafes, or as an app in other users' phones) with a back-haul connection and a wireless interface such as Bluetooth to communicate with the phones. Given large numbers of such low-cost, shortrange access-points, the mango network delivers content to the very edge of the network to within a few feet from the user.



Problem & Opportunity

There are 700+ million mobile subscribers in India and a majority of this desire access to rich content (i.e. video songs, soap opera episodes, sport clips etc.). However, access to rich media on mobile networks is priced out of reach of most users, resulting in a very low uptake. An important reason is the operators do not have the capacity to serve rich media to a large number of users, and even with the arrival of 3G networks such rich media services will not be feasible at low-price points.

Access to rich content on mobiles is very limited because of the following reasons:

- Expensive access
- Insufficient network capacity
- Difficult to use apps

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Solution

Rich content delivery over hot spots with some back haul to a mobile phone through an application that communicates with the Bluetooth/WiFi interface on the user's phone and transfer content to and from the phone.



Benefits

Low cost, easy to install application that brings rich content to millions of users who cannot afford expensive 3G plans.

Mango is designed as a pay-as-you-go service, and given the seamless billing relationship a mobile operator has with 100s of millions of users (pre-paid balance/pot-paid bills etc.) – it is ideally placed to offer such a service.

Mango brings value for emerging market operator with small investment. This Rich content service brings in millions of new data customers and increase in ARPU without adding load on the macro-cellular network

Mango service fits in with global operator and ALU strategy WiFi/Bluetooth hot-spots of today will transition to public Femtos/Picos and the "Intelligent" Femtos reduce cost of content delivery.

Mango service is In-line with ALU small-cell HLN strategy to be a forerunner as a small-cell infrastructure enabler of novel "local" applications



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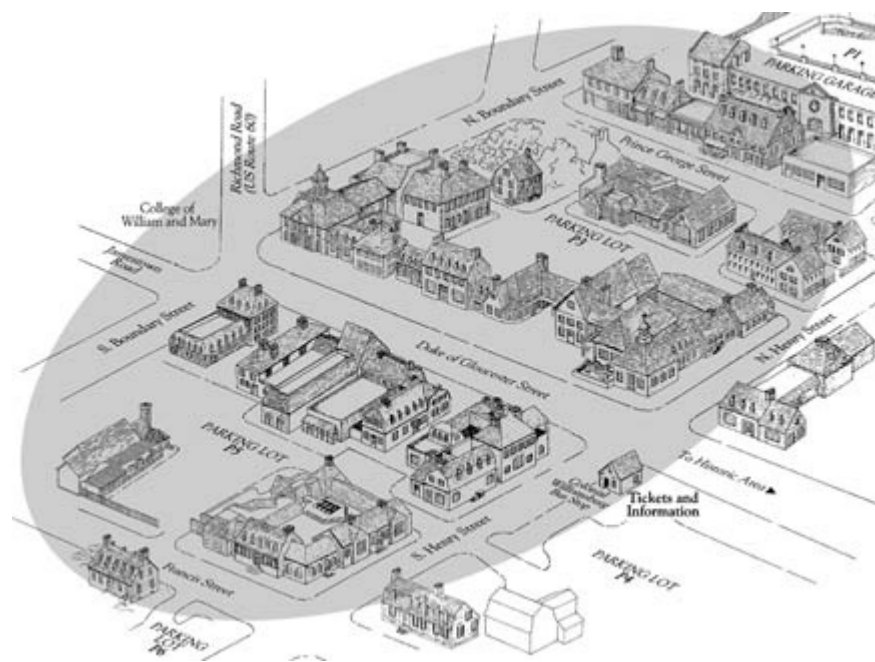
Technical Benefits

The short-range cell architecture of mango makes content delivery scalable and low-cost, and the app is designed for easy search and access to rich content – thus serving the millions users in a country like India.

Intelligent algorithms that mine a user's mobility patterns, time spent at hot-spots, content desired etc. can pre-fetch and keep the content ready at hot-spots (or preemptively fetch all the way into the phone) – so that the user experience of using the mango service is greatly enhanced.

While initially available over Bluetooth or Wifi, moving forward, the hot-spots will naturally transition into Femto base-stations. Also, each such short-range hot-spot has valuable information about the proof of presence of a user, and their environment. Once deployed, the mango infrastructure will enable a new class of novel applications that can utilize this information.

Distributed content delivery brings down the cost with server cached content from mango cells with spare backhaul capacity.



Innovation & IP

As part of this work, the researchers address several technical challenges on keeping the operational costs of running the service low and enhancing overall service performance. These include 1) mining user mobility patterns and social graph for intelligent perfecting of content 2) content delivery from the distributed cache network to reduce communication costs 3) issues around deployments on rail networks and high ways.

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