



Cambridge Wireless L-SIG, 4 November  
Technology Stream Summary Chart

# Cambridge Wireless

Location SIG, 4 November 2009

## “How Do We Make Location a Desirable User Experience”

Technology Stream Discussion Group Transcripts

David Bartlett, (facilitator), with Adrian Swinburne as Provocateur

### Morning Session

Will Bradley, Paul Fulton, Wookey, Steve Methley, Graham Maile, Charles Lee, Mark Walls, David Marsden, Rob Palfreyman, Tughrul Arslan, Mike Bowerman, Kevin McIntyre, Allan MacLean

Over Specmanship posed as an issue - “Look my Nokia N97 GPS does not work in this room, it says I'm in Cambridge”

Comment that GPS was not designed to work indoors

“Working is a subjective term”

It was asserted that “customers don't understand” which was countered with “yes they do, don't patronise them”

The problem of hidden data charges for mobile GPS devices was raised.

GPS has been “oversold”

“There is a point at which a technology is good enough”

Products and UI's don't tell the truth to users

How can or should we communicate performance to users?

*a very interesting question that the group did not answer*

Users want location everywhere all the time, twitter, facebook

Google has announced free maps, which is putting location on the map

It was pointed out that maps and location are different things and should not be confused

Poor information about the quality of location data given to users

GPS is a good technology with many uses but it is not a universal solution

GPS does not have high integrity

GPS can work well with the right expectations and under the right conditions

Most low cost mobile implementations are very poor

No one technology has the answer

Fusion of different techniques in mobile devices could be key, but cost is critical

Fallback chain could be GPS → Wi-Fi → Cell ID

but the way different technologies are integrated is the key to good performance

For mobile must work indoors, but it is really applications that count

Wi-Fi was debated because of the uncertain positions of APs which also move

Skyhook was mentioned, but “they can't drive to the world”

User generated measurements proposed as way of gathering data and finger printing the radio environment so that better position quality and reliability can be achieved.

eLoran was mentioned as alternative possible technology for indoor use, reasonable performance, but at risk of being discontinued by Obama government

VHF ranging as a general technique

Problem is high integrity and safety critical applications - mass consumer market is not the only opportunity for location technology and companies

Wide recognition that backup systems are required, but not clear what they would be

GNSS, including GPS, Glonass and Galileo can all be easily jammed

Safety critical is a driver, as well as high availability

Odometer inputs and map matching are already widely used

UWB and optical image processing techniques were mentioned as possible alternatives

However relying on installed infrastructure everywhere is stumbling block

Indoor maps are also problematic

User generated mapping content, OpenStreetMap cited as example

It was suggested that cm accuracy is required for many applications such as linking user with a point of payment - but this was disputed amongst the group  
It was pointed out that GPS data used in forensic analysis undergoes detailed lengthy scrutiny by specialists before it is sufficiently trustworthy by the courts  
“Are there any standards for indoor location APIs?”  
General agreement that standards are required, but the group did not define in what sense.  
The quality of measurements was raised again, as a necessary part of the API definition.  
It was asserted that the user doesn't care and simple x and y is good enough  
The group was divided on this with some members asking how an application could know whether to trust position information if its quality and source was not known and trusted, therefore it was suggested that an integrity measure was an essential part of the API.  
The accuracy and quality of maps, especially for supplementary information such as speed limits on roads, was raised as a problem.  
User generated content was proposed as a solution to this problem.  
It was observed that technology companies usually start at the bottom with a technology looking for a solution and they claim the best possible performance levels it can achieve, without understanding the application and the real world conditions it will be used under.  
“Technologists must understand the applications”

### Afternoon Session

*Andy Thurman, Chris Muir, Peter Dumbell, Phil Claridge, Mark Norris, Kevin Coleman, Richard Mattra, Billy Gibson, Peter Cochrane*

Discussion started with the accuracy debate.  
Some applications, such as construction and civil works require very high accuracy, but equally many consumer applications can live with low accuracy - 10km in the middle of the desert.  
Can be frustrating to technologists, because customer does not know what they want and therefore just requests absurd accuracy performance.  
Need to “suck it and see”  
Japanese use the public as a test bed - release applications early and see what the response is  
Japan is, however, very critical of poor performance  
Power should be the most important parameter for location technology and not accuracy  
Second most important is time to acquire position  
Example of digital camera which is ready for use as soon as it is turned on  
Inertial (INS) was noted as major new component technology for location  
Fusion of different techniques felt to be critical, but power becomes the issue  
It is about how we manage the different technologies  
Nintendo is a game play company and not a technology company  
Applications are the key - Who owns the customer?  
Tackle problems top down rather than bottom up starting with the technology  
Location should be given away free, e.g. Google  
We do not make money from location (in the mass consumer market space)  
There may be a case for storing measurements, not locations, and post processing them  
Very wide range of applications - need to start with the question “Where is the money”  
There are already enough technologies, we just need to figure out how best to use them  
Easier to sell location technology to companies than to consumers  
Does this mean that technology developers need not care about applications?  
NO, it is just easier to do business with companies than consumers  
The challenge is to find the useful applications  
eLoran came up as a potential alternative technology  
Getting indoor location is the holy grail  
Appropriate UI and presentation of information is key  
Tesco is releasing an API that will allow application developers to access shopper positions  
Could be used by shoppers to find goods and by Tesco to reduce theft  
Are technologists too far removed from applications?  
Do applications know what they want to do with the technology? - Two polarised views.

Too many examples of a technology looking for a problem to solve

Hobbyists could be valuable source of applications - User generated applications.

Users can be used as testers in many cases

Therefore seed market with an interesting technology and wait for users to use it - could be an approach to diverse applications and finding new and novel ways of using it.

It is an evolutionary market place

The breadcrumbs approach above was not liked by everyone in the group, so others suggested a better approach was to find the need and find the money to identify the application.

There is a gap and risk between technology and applications - how should it be managed?

Standards for accessing location information - some APIs exist: Java, W3C - but fragmented

What about niche applications rather than mass consumer market?

Device convergence was discussed - example of camera phones and phone cameras.

Converged products must perform as well as separate ones, in order to become mainstream.

For navigation GPS is mainstream and is not likely to be displaced by Wi-Fi

Cameras with GPS, direction and communications are likely to emerge

What about aggregation of measurements from neighbouring devices - clusters of users?

What about positions of things rather than people?

Is trust an issue in the aggregation model? Getting position from a neighbouring device could be useful - but only if the trust models can be established

“Trust is not an issue - it's only engineering and imagination needed to solve it”

Open APIs essential for ubiquitous sources of location - then location will be good enough for most applications.