Mobile Augmented Reality
~ A whole new world

This whitepaper is an extract from:

Mobile Augmented Reality
Forecasts, Applications & Opportunity Appraisal
2009-2014

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Mobile Augmented Reality ~ A Whole New World

Introduction

The phrase "augmented reality" was coined by Boeing researcher Tom Caudell in the early 1990s to describe a digital display viewed through a headset which guided workers through electrical wires in aircraft. The term has since gained currency and is now taken to describe digital information overlaid on the physical world.

At a time when mobile applications are achieving unprecedented download levels – fuelled by the success of the App Store and the contingent deployment of a raft of operator and vendor storefronts, so interest has grown on the opportunities for mobile applications which utilise AR (augmented reality). Applications such as Nearest Tube and Zagat's NRU have utilised geotagging technology to access information from the web about their locations.

However, these apps are very much trailblazers in their field. Augmented reality on the mobile requires a camera, GPS and digital compass, and at present only a handful of handsets offer that combination. Furthermore, while augmented reality – both within apps and browsers – would appear to offer developers the opportunity to take interactivity to a new level, there is much uncertainty as to how augmented reality content and services should be monetised, and what business models operators, vendors and content providers should employ.

Augmented Reality Via The Mobile

Augmented reality apps and browsers include layers of metadata about physical objects which have been geotagged: either by the developers of the app/browser in question or (in the case of open solutions) by third-parties, increasingly including members of the public.

The apps/browsers then identify where the user is via the GPS (Global Positioning System) in the handset and which direction he or she is facing via the digital compass: this combination

allows the handset to recognise what the viewer will be seeing via the camera viewfinder and thereby which (if any) items within that view have been geotagged.

The tags can be detected either through a simple 2-D barcode (e.g. a QR code) or through markerless tracking/image recognition. In both cases, the app/browser "hunts" for a tagged object, and, once it has located it, tracks it and imposes a digital overlay.

The end user can then "see" the digital overlay generated by the tag through the viewfinder. That initial digital image can serve also as a link to additional meta-information which the user can access simply by clicking on the digital overlay and connected to the linked Internet site.

Only in 2009 has augmented reality become practicable on high-end mobile handsets. This is because augmented reality requires five key facilities within a handset:

- Camera
- GPS
- Broadband connectivity
- Tilt sensors (accelerometer)
- Digital compass

While cameraphones, GPS and internet connectivity have been collectively available in handsets for several years, tilt sensors and digital compasses are very recent innovations: the first handset to feature tilt sensors was the Nokia 5500 in November 2006, designed as an exercise phone: however, it was arguably the iPhone 3G, launched in July 2008, which demonstrated the potential of the technology through applications such as iPint and Tilt, that has in turn led to accelerometers being included within a far greater number of smartphones.

However, the first handset to tick all of AR's requirements was the HTC Dream (otherwise known as the G1) which launched in October 2008. The handset also featured Google's open OS, Android. From June 2009 onwards, a number of other Android handsets that featured digital compasses were rolled out, including the HTC Magic, HTC Hero (G2), HT-03A (in Japan) and Samsung Galaxy. Meanwhile, a number of non-Android handsets featuring digital compasses were also made available, notably the Nokia N97 (April 2009) and the iPhone 3GS (July 2009).

At the present time, there are barely twenty augmented reality applications available. But as the number of AR-capable handset models in the market increases, and as their user base rises, so we will see an exponential rise in AR-applications.

The Opportunity for Mobile AR

Whether there is a market for mobile augmented reality products and services has yet to be proven. Like many AR developers, we do not believe that AR in itself will be enough to sell an app: a good and successful app will be a good app that also happens to have a well implemented AR facility that the consumer finds compelling and either entertaining (or, for enterprise) useful.

Nevertheless, Juniper Research feels that it is useful to see how AR is likely to be deployed across various key categories of mobile application, and the revenues that we believe will accrue from apps which have some form of AR capability.

Juniper Research has divided mobile AR applications into seven sub-categories:

- Location-based Search
- Games;
- Lifestyle & Healthcare;
- Education & Reference;
- Multimedia & Entertainment;
- Social Networking; and
- Enterprise

The Market for Mobile AR

Juniper Research has identified three key streams by which AR products and services are likely to be monetised. These are as follows:

- Pay-per-download (classified as point-of-sale revenues);
- Incremental revenue: end-user revenues derived from apps post download, or from preinstalled apps and browsers: this includes subscriptions, subscription-based licenses, one-off associated content revenues, and associated per-event billing; and,
- Advertising.

Clearly, augmented reality brings with it other associated values, such as that of, say, a AR browser preloaded onto the handset. It may be free to the end user; may not charge subscription revenues; but it has a value nonetheless, above and beyond that of any subsequent adspend attributable to it. Quantifying that value – the value a technology brings to a handset – is another matter, for above and beyond the cost of that technology (which could conceivably be one way of estimating its valuation) is the fact that its presence within a handset might be a contributing factor choosing that handset over another, non-AR model. Another, even less tangible, value is the indirect revenues resulting from additional sales of a product prompted by AR advertising. It may well be possible to gauge uplift in sales that result from AR campaigns on the mobile; at the present time, there are no such campaigns, and we believe it would be premature to attempt such calculations without any data upon which to base those calculations. Thus, our valuation of the mobile AR market is limited to those three streams defined above.

Juniper Research forecasts that the total value of these three revenue streams will reach $732 million in 2014, although annual revenues from AR are unlikely to exceed even $2 million during 2010, due to the fact that only a small minority of smartphones will be AR-enabled. However, this proportion will rise dramatically in the medium term, the result of increasing adoption of Android handsets and iPhones, along with greater deployment of AR enablers such as digital compasses and accelerometers by other leading vendors.

At the present time, only a handful of current apps and browsers have any such value associated with them (e.g., the paid-for AR game Mosquitoes and the LBS app Nearest Tube). This is likely to change from mid-2010 onwards, first as more paid-for apps are deployed and then as both incremental revenues and adspend make their way into the system.

Figure 1: Total Mobile Augmented Reality Market ($m) Split by 3 Revenue Streams 2010-2014
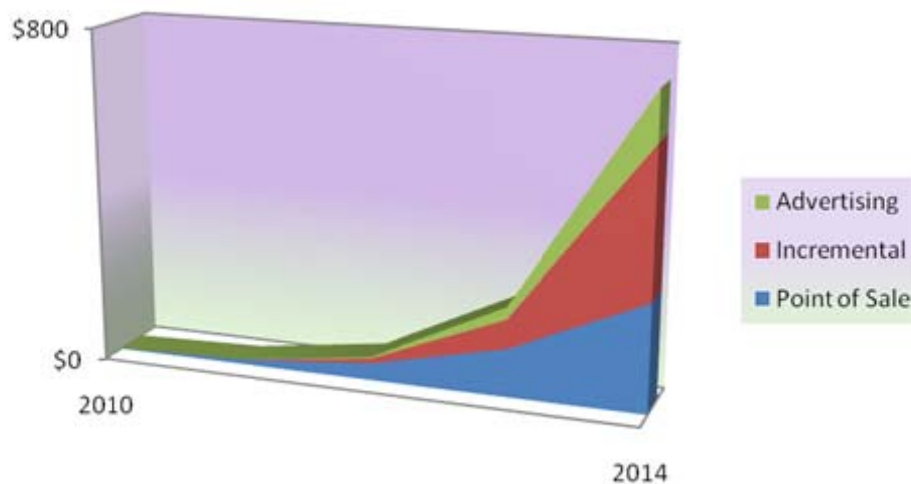
Source: Juniper Research

Order Full Report

This whitepaper is taken from the **Mobile Augmented Reality: Forecasts, Applications & Opportunity Appraisal 2009-2014** report. This extensive report discusses how geotagging will evolve over the next few years as well as explaining the likely development of the technologies used in its deployment, including markerless tracking, as well as looking at AR- enablers such as accelerometer, digital compass, GPS and mobile internet.

This report provides a number of vital recommendations for players across the value chain providing high level analysis of how revenues can be maximised from augmented reality applications. As well as analysing some of the major challenges and drivers to adoption, it also includes a number of one-to-one interviews, providing the most detailed report available on this rapidly emerging augmented reality sector.

Key questions the report answers:

1. How much will mobile augmented reality applications be worth by 2014?
2. Will vendors seek to offer on-device AR-enabled apps and browsers?
3. Which categories of AR app are likely to be most successful?
4. What strategies should brands employ as they seek to engage with mobile AR?
5. Which business models should operators and app publishers deploy to monetise AR apps?
6. What has the consumer response been thus far to AR apps?
7. What hurdles are likely to constrain the deployment and adoption of AR apps?

For more details on this report visit the website www.juniperresearch.com or phone +44 (0)1256 830002.

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