WHITEPAPER

Share, Collaborate, Exploit ~ Defining Mobile Web 2.0

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Mobile Web 2.0
Leveraging 'Location, IM, Social Web & Search'
2008-2013

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Introduction

The mercurial rise of social networking sites and user-generated content has rekindled users' interest in accessing Web-based services on the move. That the mobile phone is an inherently personal device which is not only with us most of the time, but also contains a huge amount of personal data (contact lists of names and phone numbers, stored messages and emails etc.) makes it a logical extension for the social network and the host of other collaborative Web 2.0 applications gaining traction.

Perhaps the major factors driving the shift in how the Internet operates – whether fixed or mobile – are those of user interaction and enhancement. The Web is no longer simply an online resource of information to be consulted, searched and acted upon. It has become a network of social communities and information databases that are constantly growing and improving as they continue to harness the collective intelligence of users. It could therefore be argued that whereas Web 1.0 served essentially as a broadcast medium (i.e. of information/knowledge) 'Web 2.0' takes the form of a platform whereby the creator of content, has become the focus.

Defining Mobile Web 2.0

Difficulty in establishing a firm and accepted definition, plus the fact that many of Web 2.0's core concepts cannot be replicated directly within the cellular environment, is paralleled in a similar debate on what exactly denotes Mobile Web 2.0. Whilst it is possible to identify common themes between an Internet-based and mobile Web-based application, the exact features or functionality that makes either a '1.0' or '2.0' application is still largely open to interpretation.

Perhaps the most concise definition can be derived from the work of NESSI (Networked European Software and Services Initiative). This private-public European research program pulls together various bodies and is exploring Web 2.0 technologies because they provide the capability for rapid integration of services (mashups) and, through folksonomies, for the informal description of services (i.e. user-tagged content).

According to NESSI's Semantic Technologies Working Group: 'Web 2.0 technologies can potentially deliver advanced sharing and learning functionality based on (European wide) social networks exploiting user-tagged content and overcoming individual and local limitations for knowledge end *[sic]* experience sharing. Exploiting and modelling of relationships using techniques such as social network analysis enables a new dimension for knowledge sharing and collaboration.'

Effectively, this definition for Web 2.0 boils down to three key verbs that lie at the heart of what denotes Mobile Web 2.0: 'share', 'collaborate' and 'exploit'.

What is Web 2.0?

Today, numerous definitions for Web 2.0 exist and there is ongoing debate as to whether it is simply a marketing tool, or indeed a substantive framework for future Internet development. The term was coined to describe a turning point for the Web marked by the dot-com collapse, whereby new applications and sites emerged that shared common feature sets. Table 1 summarises common Web 2.0 terminology and feature sets.

Table 1: Web 2.0 Terminology and Feature Sets

Term	Feature set
Long Tail	Describes the vast number of niche sites that have emerged to make up the bulk of the Web. In a world where the Internet is providing unlimited and unfiltered access to culture and content of all sorts, commercial and amateur content are competing equally for the attention of consumers.
Mashups	Refers to a Web application that combines data from more than one source (and typically from different organisations) to deliver a new and innovative service. There are now various genres of mashups, including: • Mapping mashups • Video and photo mashups • Search and shopping mashups • News mashups
Semantic Web	Provides a common framework allowing data to be shared and reused across application, enterprise and community boundaries. The Semantic Web embraces two goals: • Creating common formats for integration and combination of data drawn from diverse sources (whereas the original Web is mainly concentrated on the interchange of documents) • Providing a language for recording how the data relates to real world objects
Social Web	Also known as 'Social Computing', the Social Web is an umbrella term covering the wide variety of social networking tools that give users the ability to develop detailed Web identities, communicate with like-minded individuals, and create online communities: Blogs (or Web logs); Crowd sourcing or wisdom of crowds; Folksonomy (a style of collaborative categorisation of content/sites using keywords, known as 'tags'); Podcasts; RSS (Really Simple Syndication); Social networking sites; Tagging (assigning of keywords by users); UGC (user generated content); Wikis (server software enabling documents to be written collaboratively).
Widgets	Short for 'window gadgets', widgets are programs that typically look like a little window or box on the screen and provide a small amount of the functionality that you would get with a stand-alone Website or software package. There are several categories of widgets including: • Desktop widgets – mini-applications that pull content from the browser to integrate it with the desktop • Web widgets – based on browser technologies (HTML, Java, Flash etc.), these small pieces of code can be installed and run on any separate HTML-based Web page • Mobile Widgets – enable mobile phone users to access their favourite Internet content and services without the need for a mobile browser, and also to create and share content with other users

Prosumer	Combines the words 'producer' and 'consumer' and refers to the user as a creator of content (prosumption being the creation of products and services by the same people who will ultimately consume them). Prosumer also denotes the 'professional consumer' – i.e. a consumer of professional-level products and services.

Source: Juniper Research

The Mobile Web 2.0 Framework

As with Web 2.0, Mobile Web 2.0 is not a technology or standard in its own right, but a framework for delivery of collaborative applications via new user interfaces. Similarly, there are core features emerging that set the latest generation of mobile applications apart from what might now be considered as 'last-generation' mobile Internet. It should be noted that for the purposes of this report, the term 'Mobile Web' describes the Internet as delivered via a commercial cellular network to a battery-powered, handheld mobile device that incorporates voice, packet data, and flash memory – namely mobile phones, smartphones and PDAs.

Juniper Research has devised a framework for Mobile Web 2.0 on the basis that the three key verbs within NESSI's Web 2.0 framework – 'share', 'collaborate', 'exploit' – can be applied (albeit to varying degrees) when describing the functionality of each of the mobile applications summarised in Table 2.

Table 2: The Juniper Research Mobile Web 2.0 Framework

Application	Feature Set
Mobile IM (Instant Messaging) & Presence	A Presence and Instant Messaging system allows users to subscribe to each other, send each other short messages in near real-time, and be notified of changes in status (i.e. online, busy, unavailable etc.) – all via the Internet. Mobile Instant Messaging (Mobile IM) delivers a similar user experience in terms of the tools available: connecting IM communities and enabling members to interact on a one-to-one and one-to-many basis, as well as share files and status information.
LBS (Location Based Services)	Provides personalised services to the subscriber based on their geographic location. While LBS is not specifically 'Mobile Web 2.0' (and is not yet a mass market application), if used in conjunction with other applications and databases, it allows users to share their location details with others (users, third-parties or other applications), collaborate with those nearby and exploit local knowledge.
Mobile Search	Mobile Search engines are built around 'popularity mechanisms' – algorithms that determine the popularity of a certain search result within specific user segments – providing users with a tool that enables faster discovery based on the sharing of knowledge (i.e. wisdom of crowds). Mobile search engines can also incorporate contextual mechanisms such as LBS, for delivery of relevant, local results, and enablement of auto completion functionality (i.e. predictive text entry for search features) based on the aforementioned popularity mechanisms.
Social Networking & UGC (User-Generated Content)	Social Networking and UGC are both examples of the 'social web' and embody the concept of the user as both the creator and consumer of content and, for these reasons, have been grouped together for the purposes of this Report. Today's mobile phones allow users to create and share content via their favourite social networking and Web 2.0 sites, which can provide access to messaging applications such as chat, presence, IM and VoIP.

Source: Juniper Research

At the core of the Mobile Web 2.0 framework (as described by Juniper Research) lies the Web as the platform, and the user as both a creator of content and consumer of content – regardless of the method of access (i.e. fixed/mobile). At the next layer, are four elements that not only combine Web 2.0 and mobile features, but determine how each of the listed applications will in some way share, collaborate, and exploit:

- Community
- Context
- Database
- Presence

Hurdles to the Deployment and Adoption of Mobile Web 2.0 Applications

Conceptually, the biggest challenge for Mobile Web 2.0 is in understanding and defining its framework. Web 2.0 is described by a number of industry commentators as 'amorphous' in that it pulls together a number of UI (User Interface) advances – such as chat (IM & presence), blogs, video and social networking/UGC – with other applications, including mobile search and LBS (location based services) to form a generic framework. While the technologies used to deliver the mobile Internet must standardise further, a commercial evolution is also vitally necessary. Disruptions in the traditional telco/mobile value chain are forcing operators to seek partnerships with Web-based players and adopt new business models; thus they must find ways of adapting their own operations accordingly.

Moreover, given the relative immaturity of some of the applications falling within the Mobile Web 2.0 domain, their longevity is already being questioned. Can the meteoric growth of social networks be sustained? More importantly, can these services be monetised? And what will be the cost of addressing concerns over privacy and, possibly, further regulation measures? Table 3 summarises some of the other hurdles facing the delivery of Mobile Web 2.0 applications.

Table 3: Key Challenges for Mobile Web 2.0 Applications

Issue	Why is it a challenge?
Technology Fragmentation	Variations in device capability are an intrinsic characteristic of the mobile Web environment and there are thousands of different models of mobile devices in the market based on various implementations of operating systems. This makes it extremely difficult for developers to create an application that can execute a task in the same way on different devices with different navigation flows and approaches to displaying information.
Privacy & Regulation	Personal information is critical to the business models being adopted by many Web & Mobile Web 2.0 providers. Social Networking & UCG, in particular, are said to be where 'the rubble hits the road' in terms of legal issues. In many countries, there are strict regulations in place that control how and when personal data can be released. If MNOs are to be an intermediary between the user and the application they need to be able to understand who the user is, what the user wants to do and what they should be able to do, in respect of local laws and regulation. In some countries, there are also fears that the MNOs' ability to hold personal data and track a subscriber's movements could be used for ulterior motives – i.e. is the network doubling as a 'big brother surveillance tool'.
Adjusting to New Partnerships & Business Models	Business models remain in a state of flux. Traditional carrier models are not designed to accommodate Web-centric aspects such as monetising traffic via advertising, while the limited success of mobile portals thus far, demonstrates that operators do not necessarily make successful media providers. On the Web, newcomers and start-ups offering Mobile Web 2.0 applications are currently focused on building their user base and have yet to adopt firm strategies for future revenue generation. Even Web players that have gained an established audience (Facebook, MySpace etc.) are still experimenting with different business models.

Channel Dominance	In the Mobile Web 2.0 environment, it is necessary to connect the world of Web 2.0 applications (chat, IM, presence and communities) with the mobile operator's assets (BSS/OSS, CRM, network etc.) without any party controlling the end-to-end experience. Yet MNOs and device OEMs still control the distribution channels, making it difficult for independent players to survive without partnering with them. However, mobile developers and publishers are moving down the off-portal/D2C (Direct-To-Consumer) route in a bid to bypass the MNOs' stranglehold.
Cost of Mobile Data Services	Despite the fact that flat-rate data plans are gradually being introduced in some markets, the cost of mobile data remains a significant barrier to adoption, as does lack of transparency in terms of service pricing. Historically, pricing of data was complex and confusing for consumers, while the high cost per MB (particularly for prepaid customers) clearly acted as a disincentive to usage. This was partly attributable to operators' desires to maintain control of the content market by means of a 'walled garden' approach, although consumer and regulatory pressure, and increasing competition, have led MNOs to reduce their data charges.
Enterprise Sector	Mobile Web 2.0 is at an embryonic stage in the enterprise space. Mobile applications have typically been deployed as customised solutions and are often provided on a licensed basis from specialists. For most enterprises however, both Web 2.0 and Mobile Web 2.0 pose a serious dichotomy: on the one hand, they provide a means to innovate; on the other, they are viewed as presenting a significant security threat. That said, there are some examples of Web 2.0 applications being deployed (mobile IM and Wikis, for example).
Increasing Mobile and 3G Penetration	A major driver for the adoption of mobile Web services is the continued growth in the mobile subscriber base, particularly in developing markets. Of equal importance to the growth of the overall subscriber base is the increasing penetration of 3G technology, which provides greater delivery speeds for data.
Fear of Bit Pipe Scenario	The introduction of flat-rate data pricing means that MNO service revenues could be under threat from low-cost/free applications (e.g. IM and VoIP) if Mobile Web portals are opened up to competitors. The fear of being relegated to a 'bit-pipe' where data access is commoditised (i.e. higher volumes but tighter margins) has manifested in MNO's reluctance to move from the 'walled' to 'open garden' approach.
Industry Structure	Current mobile industry dynamics are said to make it impossible for small, entrepreneurial start-ups and developers to go after larger brands and licenced content. Meanwhile, branded content owners are not sure whether they actually want their content to be made available on mobile.
Security	s use of Mobile Web grows, and device capabilities become more sophisticated, so the security threat posed by mobile viruses, malware, inappropriate content, unsolicited communications and spam increases – at both a corporate and consumer level: • Viruses – could spread through mobile devices and MNO networks • Malware – rogue applications have the potential to bring down certain parts of the cellular network • WORMs (Write Once, Read Many) – have targeted UGC communities
Spectre of a global down-turn in economic growth	The consequences of reduced consumer spending could well have a detrimental effect on mobile advertising revenues.

Lack of Metrics	Growth in mobile advertising will hinge on increasing inventory, stability and clarity (in terms of cost), and more importantly, the ability to provide advertisers with detailed performance analytics. The lack of such metrics has been a major hurdle to growth, although a number of third-party providers, such as AdMob and Bango, now offer their own solutions. There are also efforts to create standard metrics, and these are being led by industry bodies such as the MMA (Mobile Marketing Association) and the GSM Association.

Source: Juniper Research

The Emerging Mobile Web 2.0 Opportunity

Mobile Web 2.0 is today a nascent market with the building blocks still being positioned. Availability of higher-speed mobile networks, a growing number of 2.5/3G users, advancements in device functionality/design, and more powerful OS (operating systems) and mobile browsers are improving the Internet experience for cellular subscribers. The drivers for Mobile Web 2.0 are discussed below [see Table 4].

Table 4: Key Drivers for Mobile Web 2.0 Applications

Driver	Why is it an opportunity?
Advertising	Mobile Web 2.0 tools such as LBS, MIM/presence, search and widgets, not only open up the Internet to mobile users, but could also provide advertisers with more reach (i.e. potentially into the long tail of mobile sites). Advertising can be delivered in new formats and in more subtle ways – contextual advertising based on the location, browsing preferences, or the type of application in use being a good example (provided privacy issues are addressed). Indeed, there are those that believe that mobile advertising has the same potential as with the fixed Internet in terms of supporting the provision of free applications (also considered a Web '2.0' trait).
Anywhere, Anytime Accessibility	Fast-moving lifestyles have created demand for time-efficient sources of information and entertainment. The great strength of the mobile communications channel is the anywhere, anytime accessibility of the mobile phone. Next to the wallet/purse, the mobile phone is the piece of personal apparel most commonly kept with individuals at all times.
Changing User Behaviour	The popularity of social networking sites and UGC, together with 'chat' mediums such as IM, reflects a sea-change in the ways people communicate, and there is compelling evidence that users want mobile access to these tools. For the younger generation in particular (i.e. 13-23 year-olds), communication is much less about voice and much more about other mediums: chatting, texting, messaging, and the sharing of experiences.
Converging Worlds of Mobile & Web	Much of the Mobile Web 2.0 market is being driven by a combination of mobile and Web, where leading brands actively exploit the commercial possibilities presented by changing user behaviour. MySpace Facebook and Bebo are typical examples from the social networking space. The dominant Web portal players – Google, Yahoo, Microsoft (collectively known as 'GYM'), and AOL, have also made major inroads into mobile, with offerings such as mobile IM, mobile search, and mobile-tailored portals. Mobile operators such as 3, Orange and Vodafone, are opening up their portals to off-portal applications and moving quickly to tie-up partnerships with Web brands. They are also bolstering their own mobile Internet and portal offerings via partnerships with other brands and content aggregators. This is indicative of the shift

	in value from 'a la carte' downloads and payment of content, to more audience-based models – under which money flows in different directions (and this is prompting new alliances).
Flat-Rate Data Pricing	The introduction of flat-rate data tariffs not only reduces the cost of mobile Internet services, but also provides greater transparency for end users. In Western Europe for example, Orange has introduced a flat-rate fee of $2.19 (€1.50) for unlimited daily access to its Orange World portal, as well as unlimited access to content 'bundles' (i.e. mobile TV, music etc.) – a tactic that it says has increased portal figures by over 150%.
Improving End-user Experience	Providing new approaches to delivering Web functionality and an improved user experience on the mobile typifies much of what Mobile Web 2.0 is about. MMS growth for example, has not been as fast as the industry had hoped because it is not so easy to both take a picture and send/upload it. Made-for-mobile applications (including content/sites) that enable users to share and exploit information instantaneously typify the Mobile Web 2.0 approach, while Apple's iPhone is cited by many as a shining example of what can be achieved in terms of the user interface (UI).
Increasing Mobile and 3G Penetration	A major driver for the adoption of mobile Web services is the continued growth in the mobile subscriber base, particularly in developing markets. Of equal importance to the growth of the overall subscriber base is the increasing penetration of 3G technology, which provides greater delivery speeds for data.
New Revenue Opportunities	Mobile Web 2.0 creates new revenue opportunities for all members of the value chain – including MNOs, Internet Portals, Technology Vendors, Device Manufacturers, Aggregators, Brands and Content Owners, and the End User.
Off-Portal Services	More and more companies and mainstream brands are launching a mobile Web presence so they can engage directly with their consumers. Made-for-mobile platforms, better mobile phone screens and faster network speeds are supporting a richer Web-like experience that is preferred by businesses to messaging-based marketing. In addition, off-portal mobile Internet sites that combine social networking, UGC and messaging applications are establishing large user bases across a number of regions and monetising services via a combination of advertising, revenue-share (with operators) and subscription models.
Value-chain Disruption	With the mobilisation of fixed Web portals/applications – i.e. those of Google, Yahoo!, Microsoft (known collectively as 'GYM') and AOL, as well as online social communities – mobile operators are facing the challenge of moving away from simply providing wireless connectivity and controlling the applications available, to being able to provide an open environment where Web 2.0 applications can move between fixed and mobile. However, opening up the network to third parties creates new revenue opportunities beyond the confines of the MNO portal. In particular, MNOs can use the off-portal search opportunity to their advantage in two ways: • The ability to search beyond the operator's portal will initially be a differentiator for MNOs in offering a quality search solution • The opportunity to target subscribers with additional keyword and targeted advertising generates a new stream of revenue from search and advertising

Source: Juniper Research

The Market for Mobile Web 2.0 Applications

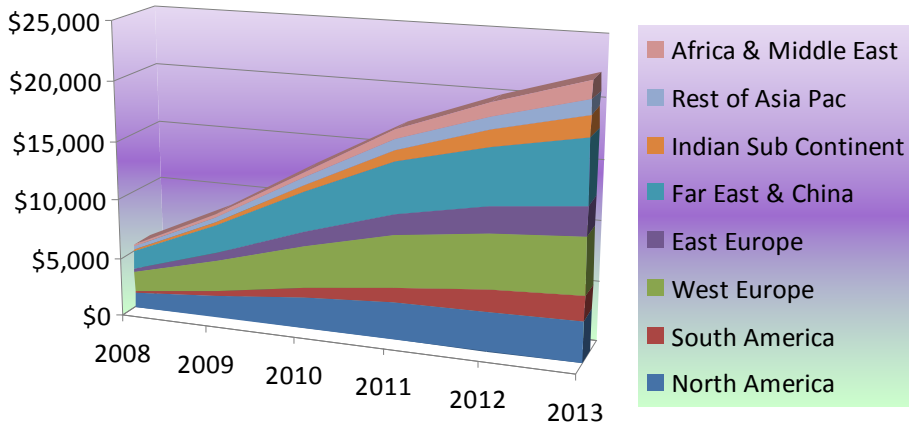
Pulling together the forecasts[1] for the Mobile Web 2.0 applications defined within this whitepaper:

- Mobile Social Networking/User Generated Content
- Mobile Search
- Mobile IM

gives a total global market of $5.5bn for the current year (2008). This is forecast to reach $22.4bn in 2013.

The global market for Mobile Web 2.0 is currently dominated by three regions: Far East & China, Western Europe and North America. However, also evident is the significant growth that will be witnessed in the developing regions – India Sub Continent, South America, Africa & Middle East, Eastern Europe and Rest of Asia. Aside from the latter, the factor unifying these markets is a lack of fixed-line infrastructure, coupled with growing mobile penetration.

Figure 1: Total Revenues for Mobile Web 2.0 ($m). Regional Forecast 2008-2013



Source: Juniper Research

Juniper Research expects that collectively, the five developing regions will overtake the dominant three over the course of the forecast period. India Sub Continent will be the fastest growing market for Mobile Web 2.0 with South America as the next largest growth market with a CAGR of almost 59%. Eastern Europe and Rest of Asia will follow, growing by a CAGR of 50% and 45% respectively.

[1] LBS is excluded from forecasts in this instance, on the basis that it is not a direct source of revenue

Order Full Report

Mobile Web 2.0: Leveraging 'Location, IM, Social Web & Search' 2008-2013

This whitepaper is taken from Mobile Web 2.0: Leveraging 'Location, IM, Social Web & Search' 2008-2013.

Share, Collaborate, Exploit - The Mobile Web 2.0 report provides the most cohesive understanding of the current and future opportunities for the Mobile Web 2.0 market to date. The 250 page report presents a complete examination of the key service drivers and constraints and defines a practical framework which incorporates all of the following applications (location based services, instant messaging, social networking/User Generated Content and search). The report presents an overview of the Mobile Web 2.0 technologies and standards in development which signify a turning point for mobile web. Current rollouts on a region by region basis are given, and an analysis of the business models that are being adopted and/or considered is also presented. Through crucial interviews with major players within the Mobile Web 2.0 value chain and creation of a definitive framework, Juniper Research then provides regional revenue forecasts for each of the applications up until 2013.

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

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Ian Chard is an Analyst with Juniper Research. With more than ten years experience in the communications technology sector as a technical writer and journalist, he has held key editorial positions on a number of respected b2b publications and has conducted independent projects for leading industry vendors. His specialist areas embrace mobile & wireless, telecoms, enterprise voice & data networks, and biometric technologies.

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