LTE Direct Workshop White Paper

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[1] Introduction

An LTE Direct workshop organized by Qualcomm and Samsung in May 2013 brought together thought leaders from Deutsche Telekom, DOCOMO, KDDI, Orange, Placecast, Samsung, SAP, Sapient, SKT, Softbank, Tagged, and Verizon. Workshop goals included understanding the business opportunity for proximate services in the Mobile Retail and Social Discovery space, discussing how operators can leverage LTE Direct to benefit from this space, and understanding key platform considerations for an LTE Direct deployment, which is currently being standardized in 3GPP as part of R-12.

The mobile revolution is changing the way we interact with people and things around us. Proximity Awareness, the ability to passively and continuously search for relevant value in one's physical proximity, is at the core of this phenomenon.

LTE Direct provides an unprecedented opportunity for operators to be a key part of this Proximity Awareness development. It offers a long-range scalable, battery-efficient, privacy-sensitive platform for users, apps, and services to discover one another in proximity.

This white paper summarizes key discussions from the workshop.

[2] Proximate Awareness opportunity

2.1 Mobile Retail opportunity

Panel discussions at the workshop clearly validated the tremendous business opportunity in Mobile Retail and, more importantly, highlighted the operator opportunities from the LTE Direct proximity platform.

A Harris Poll commissioned by Placecast showed that one-third of cellphone users were interested in mobile marketing. In another poll, 89% of consumers indicated that it is important to receive offers from nearby businesses. The high rate of return to advertisers using the Placecast Shop Alerts solution (push advertising) is evidence of the consumer demand. Placecast also found that 50% of consumers receiving the shop alert entered the stores and 50% of those entering the store made a purchase. These statistics are extremely high compared to traditional mobile advertising.

In Germany, Deutsche Telekom AG conducted market research on retailers from the clothing, fashion, restaurant and bar retail segments across chains, franchises and mom-and-pop stores. The survey results show a clear opportunity for LTE Direct based services among the cross-section of respondents.

Larger chains have an online presence via their own websites or Facebook pages. They see huge potential in location-based mobile advertising but find that existing solutions are cumbersome and offer little utility to the end consumer. As a result, nearly all of their ad spend is on offline advertising.

Mom-and-pop stores face a different challenge. They do not have the ad budget of big brands to run effective offline campaigns. Neither do they have the prime retail locations to drive customers into their stores. They are looking for simple and easy-to-use solutions to drive foot traffic into their stores.

Despite this inherent opportunity in Mobile Retail, current solutions suffer from several shortcomings. They lack the reach and scale required to drive consumer adoption. There is also considerable lack of accurate mobile ad inventory. A lack of privacy sensitive solutions further limits consumer embrace of these solutions. There are already European Union government regulations on tracking user data. Similar regulations are expected to be adopted in the United States.

LTE Direct offers the ideal platform to address the scale, reach, and privacy limitation of existing Mobile Retail solutions and provides operators with an exciting new revenue stream.

2.2 Social Discovery opportunity

Social Discovery is about connecting people through content and discovering content through people. The Social Discovery market includes information sharing, social networking, messaging and dating. The Social Discovery messaging market is currently $23 billion, a majority of which comes from users moving away from SMS-based messaging. Advertising is the lifeblood of the social networking market, estimated at $10 billion worldwide, according to eMarketer estimates. A key recent trend in social networking is Ambient Awareness, which involves finding people and interests in one’s proximity. Foursquare, Banjo, Path, Highlight, Glancee (acquired by Facebook), Sonar, and Shopkick are examples of recent Ambient Awareness SNS apps.

Current Application Service Providers (ASPs) find existing technologies that enable Ambient Awareness to have severe limitations. Using GPS is fairly expensive for ASP infrastructure and also on the device’s battery. In addition to battery drain, translating latitude and longitude to meaningful data using map and location information obtained from a wide variety of sources is a significant hurdle for Ambient Awareness ASPs. This effort requires large server infrastructure, reliable network connectivity, and significant human resources to achieve even rudimentary functionality, to say nothing of the difficulty in creating seamless user experience.

Ambient Awareness applications are inherently transient and require a critical mass of users to make an application relevant. Current solutions also suffer from reach and scale limitations. Higher adoption by consumers in this space will directly translate to opportunities for operators to enable a platform which provides scale and battery efficiency.

Privacy is also an important consideration for Ambient Awareness applications. Using at-times-sensitive data from users to create unique experiences, ASPs must also balance the users' expectations of privacy and application performance. To facilitate greater adoption of Ambient Awareness applications, users must feel confident that the use of their data comports to their overall expectations and specific situational variants.

[3] Technology considerations

3.1 Limitations of existing technologies

Existing technologies used to serve the proximity awareness can be broadly divided into peer-to-peer (P2P) and over-the-top (OTT) solutions.

Wi-Fi Direct and Bluetooth are the main P2P solutions used today. Both suffer from range and scalability issues. Wi-Fi Direct provides device-to-device connectivity, and while it is possible to enable proximate discovery on Wi-Fi Direct in very low densities (<10 users), the battery impact increases exponentially as the number of users increases. This is primarily because Wi-Fi Direct is a two-step discovery process, operates in unlicensed spectrum, and deals with uncontrolled interference from other devices using the same spectrum. The range of Wi-Fi Direct (<100 meters) is also much lower than LTE Direct (up-to 500 meters).

Bluetooth also suffers from scalability issues similar to Wi-Fi Direct because it operates in unlicensed spectrum and also has a much lower range (tens of meters).

In the OTT model, a server located in the cloud receives periodic location updates from user mobile devices. The server then determines proximity based on location updates and interests. The constant location updates result in significant battery impact because of GPS power consumption and the periodic establishment of cellular connections.

3.2 Privacy considerations

There are legitimate concerns about location-based applications that constantly monitor users' locations, including privacy, legal, and retailer brand concerns.

Consumer wariness of mobile app privacy practices is real. A recent survey found that over half of Americans had uninstalled or decided not to install an app because of concerns about its privacy practices, including mobile apps that "grab too much data."[1] Sharing of location information has heightened concerns for consumers, particularly where the location tracking is constant.[2]

Regulation of location information is also on the rise. Many laws consider location information to be sensitive data and therefore subject it to tighter standards. Many proposed laws being debated would increase the obligations of app developers when it comes to collecting location information.[3]Hardly a week goes by without reports in the mainstream press about a company experiencing a significant privacy debacle. Such privacy incidents can have serious negative impacts on company reputations and may demand significant executive time and resources. As a result, major brands are understandably cautious about embracing location or proximity awareness technologies and prefer solutions that minimize privacy risks.

LTE Direct addresses some of the privacy concerns of current location technology. Most current location-based loyalty or retail apps require constant (or nearly constant) real-time location tracking through approximate, network-based, location and/or precise GPS location. The user can be located in a different city, across the country, or at his/her house, yet the retailer is constantly receiving location information. In contrast, with LTE Direct, a developer can create an app that broadcasts offers only to users near relevant merchants. In this case LTE Direct has two clear privacy benefits: (1) there is no constant location tracking of app users (only proximate users receive offers), and (2) even proximate users are located only if they act upon the offer and opt-in to provide their information.

LTE Direct also has privacy benefits for social networking apps. With today's social networking apps, users can discover that they are located near others with similar interests through a series of server calls. The social network is therefore building a robust location dossier that goes far beyond simply knowing when "A" is next to "B". With LTE Direct, proximate discovery is done locally. This eliminates data transfer issues and reduces the amount of location information sent to the social network. LTE Direct's peer-to-peer proximity discovery thus has the capability to provide more privacy than some existing solutions.

[4] Operator business models

Multiple business models are available to the operator to leverage the LTE Direct opportunity in the proximity awareness space. Some of the models discussed during the workshop are:

- User subscription – Users are charged a nominal monthly fee to access the LTE Direct functionality. The user benefits from improved battery consumption, privacy management, and reduced data usage while using proximity applications. Operators can also enhance the LTE Direct service by providing value-added services such as friend finder applications, private party sales and dating applications.
- API access fees – Operators charge ASPs for access to the LTE Direct platform APIs. ASPs benefit from higher user adoption resulting from improved battery efficiency, reduced data usage, and improved privacy. ASPs also profit from significant server infrastructure and human resource savings. Operators can start by providing free API access to ASPs. Once these apps get traction, operators can charge for API access.
- Value-added services – Operators can stack services such as proximity-based advertising on top of the LTE Direct. Retailers have a significant need for proximity-based advertising solutions but existing solutions do not meet their needs (as discussed in Section 2.1). Retailers are willing to spend part of their existing monthly ad budget for proximity-based advertising solutions that meet their needs. The reach, scale, and privacy benefits of LTE Direct make it an ideal platform for operators to provide an effective proximity advertising solution for retailers. The LTE Direct platform also provides operators with rich context data that can be used to target relevant offers to the end consumer. It is important, however, that operators not bundle all services from day one, but layer additional services as the platform gains traction.

It should be noted that these are only a subset of possible business models and further discussion is required to develop additional LTE Direct business models.

[5] Service platform considerations

LTE Direct is currently being standardized as part of 3GPP Release 12. The scope of 3GPP standards effort extends to radio- and network-related aspects. Several of these aspects should be addressed to ensure a successful commercial LTE Direct platform adoption.

5.1 Interoperability

Scale and reach of the LTE Direct service is critical for Mobile Retail and Social Discovery applications. ASPs need to ensure that apps built on an LTE Direct platform can function between the different operators in a specific region. Interoperability can be achieved in multiple ways:

1. By allowing devices from Operator A to tune to Operator B's spectrum to listen to announcement from Operators B's LTE Direct devices during discovery. Operator A's device transmits its announcements in Operator A's spectrum.

2. All devices in a country/region transmit and receive announcements on the same LTE spectrum band(s) that is agreed to by all of the operators in that country/region.

A key element involves the business agreements that need to be in place to enable interoperability. This may appear to be a difficult hurdle to cross, but the success of SMS is proof that successful cross-operator business agreements to enable interoperability are possible. SMS initially started with devices able to send messages only to devices within the same operating system. This limited end user value of the service. The service took off once operators entered into business agreements to allow SMS interoperability.

Local groups such as the YouConnect consortium in France can help solve the fragmentation issues typically associated with carrier APIs. In France, the big three national operators − Orange, Bouygues Telecom, and SFR − have formed a consortium called YouConnect that exposes an API which allows m-commerce apps to auto-fill purchase information from carrier subscriber databases. These three operators have a large percentage of France mobile subscribers. The proximity API solution from LTE Direct can be developed in a consortium similar to YouConnect.

5.2 Analytics

Advertising is at the core of the Mobile Retail and Social Discovery business opportunity. It is important to provide advertisers with metrics that they care about to measure the effectiveness of their ad spending. Some of these metrics include dwell time, user demographics, user behavior, user identification, and user response to promotions without sacrificing appropriate privacy concerns. The LTE Direct platform also needs to ensure that advertisers are able to effectively close the loop on ads served via the LTE Direct platform. One option is to close the loop via the integration of mobile payment as part of the LTE Direct platform or vice versa.

[6] Conclusion

This workshop clearly demonstrated the operator opportunity for LTE Direct based discovery based on the discussion from the thought leading operators in this space. The discussion also showed confidence in the possible business models for LTE Direct in the Mobile Retail and Social Discovery verticals. All of the participants agreed that LTE Direct provides a unique opportunity for operators to be a key part of developing this Proximity Awareness platform.

The workshop identified interoperability and analytics as the key service platform considerations. In order to facilitate the development of the ecosystem and drive adoption of the services, participants agreed to continue these discussions and to dig deeper into the details of the solution and business models. These will be further developed in the next LTE Direct Workshop.

Acknowledgements

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References

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[2] *Sameer Patil, Greg Norcie, Apu Kapadia, Reasons, Rewards, Regrets: Privacy Considerations in Location Sharing as an Interactive Practice, Symposium On Usable Privacy and Security, Jul. 13, 2012, (http://delivery.acm.org/10.1145/2340000/2335363/a5-patil.pdf?ip=199.106.103.53&acc=ACTIVE%20SERVICE&key=C2716FEBFA981EF1AFF9CE98BEF6D1224D6983565824B302&CFID=229127161&CFTOKEN=26048500&__acm__=1371835826_d650265d169dd987e1f3c370f9c0ee4b.)*

[3] *See e.g., Location Privacy Protection Act of 2012, S. 1223, 112th Cong. (2012), (http://www.govtrack.us/congress/bills/112/s1223/text)*