Subject: NSF SBIR IC2.A—Neda's Libre Texting: A Reshaping of the Medium
Date: May 27, 2009

Dear Dr. Arkilic,

My name is Mohsen Banan and I am the Primary Investigator for an NSF SBIR proposal we intend to submit by the June 9 deadline. Our company name is Neda Communications, Inc., and our proposal is in area IC2.A (Applications; Mobile applications), for which you are the Program Officer. This will be our first submission to the NSF.

The title of our proposal is: "Libre Texting: A Reshaping of the Medium."

We are proposing a new incarnation of the Mobile Messaging/Texting medium based on the Free Software ideology. Our proposal is quite unusual in a number of respects. Our proposal is not primarily about new functionality—it is about a radically new model for delivery of existing functionality. In terms of capability, Neda Libre Texting will provide essentially equivalent functionality to existing Mobile Messaging/Texting solutions such as the proprietary BlackBerry system.

But our model for ownership and delivery of this functionality is fundamentally different—it is a completely non-proprietary, or **Libre** implementation and delivery model. No aspect of our implementation is constrained by proprietary ownership mechanisms such as patents or restrictive copyright. We believe that this new **Libre Texting** model will have major engineering, business and societal consequences.

In the attached PDf document (below) I provide a summary of (1) the company, (2) the market opportunity, (3) the technology/innovation and (4) the competition. I am also including an overview of our Phase I research objectives.

Would you kindly please review this summary and let me know if our proposal and this general outline conforms to the program to which we are applying?

With regard to Letters of Support for the Technology, note that our proposal represents a disruptive/transformative new modelling for an existing societal capability. The viability of the Texting medium and its societal importance are already well proven in the marketplace. Given this, we believe that Letters of Support to demonstrate technological/business viability are not necessary here. Do you agree, or do you feel that conventional Letters of Support will still be an important requirement for our proposal?

We look forward to and will greatly appreciate any comments and criticism you can offer.

Thanking you in advance,

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1 Company/Team: Neda Communications

Neda Communications, Inc. is a well-established company with a proven track record of technical proficiency and profitability. Neda is privately held and to date has received no external financing.

Neda has been actively involved in the wireless data industry since 1992. From 1992 through 1994 Neda was the lead designer and primary architect of the Cellular Digital Packet Data (CDPD) System Specifications. From 1994 through early 1997, Neda designed and implemented much of AT&T Wireless Services mobile messaging prototype software and systems, for use over Narrowband PCS and CDPD wireless networks.

This will be our first submission of an NSF SBIR proposal.

1.1 The Team

Neda has a core team of technical and management personnel with extensive experience in the wireless data communications field, and a track record of technical accomplishment and business success. Among the team there are relationships going back almost twenty years, reflecting a long history of productive cooperation.

The following are brief professional biographies for Mohsen BANAN (Principal Investigator) and Andrew HAMMOUDE (Senior Personnel).

1.1.1 Mohsen Banan

Mohsen Banan is an engineer, businessman and entrepreneur. He is the founder of Neda and the team leader. Mohsen is the primary author of the LEAP (Libre Efficient Application Protocols) RFCs, and of their software implementations. He is an expert in the design and implementation of distributed systems, in particular message handling systems, directory systems and mobile data networks. Mohsen holds a BS degree in Electrical Engineering (Magna Cum Laude) from Seattle University, and an MS degree in Computer Engineering from the University of Washington.

1.1.2 Andrew Hammoude

Dr. Andrew Hammoude has over 25 years engineering experience, including academic research and teaching experience, and industrial experience in the form of engineering design, project management, consulting, and entrepreneurship. Andrew has been with Neda Communications since 1999. He has an undergraduate degree in Engineering from the University of Cambridge, an MS degree in Electrical Engineering from the University of Toronto, and a Ph.D. in Electrical Engineering from the University of Washington.

2 Market/Business Opportunity: Texting/Mobile Email

In this NSF SBIR, we are proposing a completely non-proprietary implementation for mobile messaging/texting. We call this the **Libre Texting** model.

Thus our proposal is not about a new type of product or service. Instead we are proposing the reinvention of an already existing and established communications medium—the mobile messaging/texting medium—in a radically new form.

The mobile messaging/texting medium of today exists in the form of a proprietary, walled garden model. But as we describe in the next section, the walled garden model is coming to the end of its natural lifetime. The window of opportunity for Libre Texting is now open, and the scope and scale of this opportunity is immense.

As an established communications modality, the magnitude of the Texting market is already well characterized. For example we refer you to the article titled *thx 4 the revnu* by Steven Cherry in the October 2008 issue of IEEE Spectrum, available at:
http://www.spectrum.ieee.org/oct08/6817

This article provides relevant analysis and statistics on Texting usage and market size. Quoting from the article:

> $100 billion. Thats an estimate of how much the worlds 3.3 billion cell phone users spent to send 1.7 trillion text messages last year—more than Hollywoods worldwide box-office receipts, global music sales, and U.S. video-game and PC-game sales combined.
>
> In fact, those movie, music, and gaming revenues will come to only about half the US $130 billion that short message service (SMS) will bring in this year, according to the market research firm Informa Telecoms & Media.

When we add to this revenues from mobile email (as opposed to SMS) solutions and factor in the rapid growth of these markets, we are looking at about a $150 billion dollar Texting market over the coming years. Placing this in the context of our $150 thousand Phase I SBIR funding application, we see that the market size is about one million times greater than our funding request.

As leaders in the new Libre Texting paradigm, our long-term business execution strategy calls for participation in every major component of the Libre Texting technology chain. These include:

- Sales of commercial software licenses for use in closed, proprietary cell phone devices (where GPL-licensed software is prohibited).
- Device software integration. We will configure and resell PDAs for out-of-the-box texting operation.
- Software products and support for customer premise texting solutions (email forwarders, filters, etc.)
- Libre Texting ASP services, in the form of multiple business models and partnership arrangments.

3 Technology/Innovation/Research: Libre Texting

The mobile messaging industry of today is a closed, proprietary construct. Existing wireless texting/messaging implementations (telephony SMS, and mobile email solutions such as BlackBerry) are walled-garden implementations, closely protected by patents, copyright and trade secrecy. The wireless phone companies and/or their business partners own and control every component of the messaging service, including the device, the protocols, the software and the network.

But all that is about to change. It is now possible to implement a completely open texting solution, without dependence on proprietary control of any asset. A number of industry developments make this possible:

- Public spectrum Wi-Fi is now ubiquitous and has become the standard technology for final-leg device connectivity. In many locations Wi-Fi is available for direct, single-leg connectivity between the mobile device and the open Internet. This coverage can be expected to spread, eventually resulting in near-universal Wi-Fi Internet access.
- In situations or locations where direct Wi-Fi Internet connectivity is not available, a number of wide-area networks now exist to provide second-to-last-leg, wide-area wireless connectivity.
- Mature and sophisticated Linux-based PDAs are now readily available for use as generic open mobile devices.
- Open, patent-free protocols exist for efficient wireless messaging.
- Device and server implementations of the protocols exist in the form of free software.
- The eventual transition to IPv6 will allow restoration of the true mobile Internet end-to-end model, delivering mobile messaging capability without any form of built-in dependence on the service provider.

These developments now allow implementation of a **Libre Texting** model—meaning a completely open mobile messaging model, without any proprietary components or dependencies.

And since this is technologically feasible, and since the business imperatives to do this are enormous, this has now become an industry inevitability.

This can be expected to cause a revolutionary transformation of the Texting industry landscape. Freed from walled-garden control, the Texting industry is now thrown open to technological and business competition at every point within the Texting technology chain, allowing unrestricted technical innovation and industry growth.

In addition to these technical and business consequences, the Libre Texting model also has major societal consequences. The Libre model provides guarantees of critical civil liberties such as privacy and freedom of speech, that are severely compromised under the existing proprietary model.

Neda Libre Texting

We propose to research the technical aspects and feasibility of providing a complete Libre Texting service on very large scale (planet wide), based on a specific component selection. We call this defined implementation the **Neda Libre Texting** implementation.

The key component of our implementation is a set of mobile messaging protocols called the EMSD protocols. These protocols fully satisfy the necessary technical requirements for mobile messaging. They provide the efficiency required for wireless applications, and support push-mode message delivery, an essential requirement for the expected immediacy of texting. They are truly open and patent-free, and have been published as RFC-2188 [**?**] and RFC-2524 [**?**]. Complete details about EMSD are provided in the article titled, *EMSD: The LEAP E-Mail Component* [**?**].

Our Phase I research objectives include:

- Investigate approaches for incorporation of the EMSD software protocol implementations into widely used Message Transfer Agents, in particular qmail (http://www.qmail.org/). We hypothesize that it will be feasible to exclude message queuing and spooling functionality from the software implementation of EMSD, and instead provide this functionality via qmail.

- Analyze the feasibility of reusing the queuing and spooling system of qmail, in conjunction with lower-layer presence detection (Mobile-IP, OpenVPN), for immediate EMSD delivery.
- Empirically measure initial EMSD submission and final EMSD delivery delays for messages on the order of 1000 and 4000 bytes, and compare end-to-end submission delays against SMTP, and final retrieval against IMAP.
- Identify and eliminate/minimize the causes of end-to-end submission and delivery delays.
- Improve ESRO retransmission timer algorithms to minimize adverse link effects in the case of large scale deployment.
- By modelling and empirical verification, establish the optimum software module configuration for the Message Transfer Agent.
- By modelling and empirical verification, establish the optimum software module configuration for the device.
- Research the requirements and practicalities for full device integration on Linux PDAs. (E.g. alert mechanisms and control, user interface integration, etc.)
- Identify and analyze alternative approaches for on-demand mailbox synchronization, based on existing software and protocols.
- Improve Access Point selection procedures to support Wi-Fi Easements.
- Publicly release and make website available the MTA and Device software in source code form subject to GPL, LGPL and AGPL licensing.

The Neda Libre Texting research and implementation work will specifically exclude use or consideration of proprietary software or patented protocols.

4 Competition: Protocols/Service/Software

The nature of competition within the Libre context is very different from the proprietary context.

Though Libre Texting and proprietary messaging solutions provide equivalent functionality, we do not view the existing proprietary services as meaningful competition. A proprietary construct cannot survive in the presence of a Libre alternative, since the essential proprietary defences are now rendered ineffective. Libre Texting is a disruptive new paradigm, causing extinction of the existing proprietary paradigm.

Within the Libre context, it is not possible to maintain sustainable advantage on the basis of proprietary ownership, nor is it possible to create advantage on the basis of functional service differentiation from any other Libre Texting service provider. Any technical enhancement becomes instantly available to all providers throughout the entire Libre environment.

Instead, competition within the Libre environment becomes a matter of which protocols, software implementations and services are used to implement and deliver the service.

With regard to protocols/profiles, we recognize Lemonade (RFC-4550) [**?**] and PUSH-IMAP as potential alternatives to EMSD. However, we believe that the efficiency characteristics of EMSD [**?**], which are not matched by these IETF-proposed protocols, will prove decisive. The efficiency of EMSD is better suited to Libre Texting, particularly in the case of narrowband wide-area networks.

With regard to free software protocol implementations, alternative and/or overlapping software capabilities are inherently non-competitive, and freely available for integration in our own Neda Libre Texting implementation. Furthermore, our own implementations are accompanied by a coherent business model, which is not the case for most other FOSS projects.

With regard to Application Service Providers (ASPs), we expect that proprietary services such as Google, MSN and Yahoo will be reluctant and slow to adopt the Libre Texting model, because of their existing business relationships and investment in proprietary solutions such as BlackBerry.