

**Prepared Statement of
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**U.S. Senate RFID Caucus
Inaugural Meeting**

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Good afternoon Chairman Cornyn, Chairman Dorgan, and members of the RFID Caucus. My name is Daniel W. Engels, and I am currently an Associate Professor in the Department of Electrical Engineering at the University of Texas at Arlington. I am also the Founding Director of the Texas Radio Frequency Innovation and Technology Center, a multi-disciplinary, multi-university research center with collaboration between the University of Texas at Arlington, the University of Texas at Dallas, the University of North Texas, and North Lake College. You may be more familiar with me for my work as one of the original architects of the EPC System and as one of the leaders of the MIT Auto-ID Center and MIT Auto-ID Labs. Our work at MIT revolutionized an industry and launched the current RFID adoption explosion.

Thank you for inviting me here today to participate in this inaugural panel and to discuss the important topics of RFID education, adoption, and policy challenges. As this Caucus considers the future of RFID adoption, the immense benefits to society that this adoption will bring, and the policy challenges that must be addressed along the way, it faces choices linked inexorably to consumer education, consumer choice, economic opportunity, and technological innovation. In turn, the way we approach these policy choices will have a tremendous impact on our ability as a nation to compete effectively on the global stage. In short, I appreciate the opportunity to share some brief thoughts and discussion about issues affecting nothing less than the future benefits achievable with RFID technologies and the future of RFID technologies themselves, and I look forward to expanding upon my brief remarks in the future.

The formation of the Senate RFID Caucus coincides with the beginning of a new chapter in my career, joining UT Arlington and co-founding the Texas Center. It is a mutual inflection point that provides an opportunity to examine what has been in order to guide us as we create what will be. Looking back over the journey of EPC technologies that began in 1998, I am struck by how interesting this long journey has been, by how much ground has been covered thus far, and by the significant distance yet to go. Being at the epicenter for the formation of the EPC concepts and technologies and leading their growth and development, my journey has provided the educational opportunity of a generation. Allow me to share some of my many learnings from this education that you too already know and that will be the most influential in our deliberations and decisions moving forward:

- The EPC System was designed to maximize user choice and innovation in the use of its component parts, which is leading directly to an explosion in the benefits realized from their use and deployment. The use of a layered, component-based, end-to-end system design built upon the Internet and the World Wide Web allows for a decentralized, open system. This has created an environment and system components where anyone can create value added systems and services to meet the identified needs of the marketplace.
- RFID technologies garner the lion's share of the media attention, but they are little more than enabling technologies that may have a broad range of functionality. RFID technologies are simple components in the broader system. Robin Koh, a friend and former colleague at MIT once likened RFID tags to "barcodes that bark." I believe that a better analogy for RFID tags likens them to cellular telephones for objects. RFID systems are cellular telephony systems designed for objects. RFID tags enable you to reach out and touch an object nearly everywhere. Cellular telephones

enable you to reach out and touch someone nearly everywhere, but in the end are little more than glorified RFID tags for people. The flexibility of the RFID technologies and the applications that use them provide a diverse innovation and competitive market landscape.

- People understand cellular telephones and bar codes. They understand RFID systems too. The vast majority of them just don't realize it yet. Accurate, unbiased education on the capabilities and limitations of RFID technologies is essential to realizing all of the benefits that they are capable of providing. Partisan, biased, and partially truthful information serves only to confuse people and slow the realization of RFID enabled benefits.
- RFID technology is inherently neither good nor evil. The applications using RFID technologies will be overwhelmingly good and beneficial to society. Policies and laws exist to define the acceptable boundaries, which is to say the boundaries of "good." RFID technologies have been used for decades in a broad range of industries and applications ranging from livestock management to access control to highway toll collection to vehicle immobilization systems to asset management. The boundaries of "good" use already exist for RFID technologies. The new focus on RFID technologies is simply an opportunity to sharpen the boundaries that already exist.

I believe that consumers and users of RFID technologies and RFID enabled applications should be able to use the RFID technologies that they pay for the way that want within the good boundaries. The principle that users pick the winners and losers in the RFID marketplace, not partisan organizations, is an architectural and policy choice critical to innovation in this still emerging technology area. I am passionate about the bright future of radio frequency enabled technologies and applications. Embeddable RF enabled sensors will enable us to monitor, treat, and prevent diseases in humans. Intelligent pharmaceuticals will dramatically improve the safety and security of our pharmaceutical supply chains. And, yet to be developed technologies and applications will provide never before dreamed of benefits to mankind. The vibrant ecosystem of innovation developing around RFID technologies creates wealth and opportunity for millions of Americans. This innovation ecosystem should be nourished and promoted.

Chairman Cornyn and Chairman Dorgan, I commend you and the members of this Caucus for your thoughtful leadership and attention in this area, and I look forward to working closely with you in the weeks and months ahead. I am available to you as an expert resource should you need my assistance.

Thank you.

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