

The Next Wave of the Internet: New Opportunities and Challenges for Entrepreneurs and Investors

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The components of the next wave of the Internet are under development now, bringing new opportunities and challenges. Various named Internet II, the Next Generation Internet and the Great Global Grid (GGG), this new wave has the potential to meet and exceed the promises of the last decade: virtually frictionless supply chains, unparalleled knowledge expansion, and applications with the potential to transform our economy and society. Equally clear, it will challenge the best minds in technology, finance, corporate management and government in ways we can now only imagine.

The Opportunities

This next wave is under development on three basic layers:

Infrastructure. Beyond the physical plant, there is a great deal of entrepreneurial development going forward on key bandwidth related issues -- including faster and more efficient routers, last mile solutions, intelligent caching and edge serving, load balancing, and wireless protocols. Equally important work is going forward on security, privacy and reliability.

Significant research is moving forward in the public and education sectors (primarily the Internet2 and Next Generation Internet initiatives), and in key corporate R&D departments. Standards bodies such as W3C and IETF are working to secure the next wave on a standard infrastructure. Finally, the productization of solutions is taking place in hundreds of early stage companies, as well as established technology enterprises. The opportunity for venture capital and entrepreneurs is significant and it is here now.

Other supporting infrastructure technologies will also be necessary if the next wave is to truly shift the paradigm. Relevant work is moving forward in areas such as multimedia database storage and retrieval, artificial intelligence, wireless technologies, new mobile and stationary form factors (yielding the ubiquitous Internet), and continuing advances in chip and systems design.

Platforms and Tools for Software. The challenge of bringing down silos to integrate information and applications, and not just machines, is a key unsolved problem. The model for the solution is in new standards based interconnect, messaging, information description and service protocols (including XML, SOAP, WSDL, UDDI) layered on the old Internet standards -- the much touted paradigm of Web Services.

In the early adopter stage, Web Services technology and commercialization is being driven by two camps: the Microsoft .Net cluster of platform and development technologies; and the Java (J2EE) camp, driven by Sun, IBM, Oracle and others. Other established players (such as Rational, Borland, TIBCO, BEA) are lining up to deliver Web Services tools and platforms. While relatively new in this area, the power of these forces to drive this technology and develop markets is enormous. They also have the power to drive a host of venture funded entrepreneurial companies, which are starting to form and fill in the gaps.

Applications. What applications will be built on this infrastructure on these platforms with these tools? That is much too big a question to speculate on in this space, since it involves about anything you can think of, and much you cannot yet imagine. Suffice it to say, that we should think beyond the

usual and important examples such as seamless integration of supplies chains, to new forms of social integration, enhanced human services, knowledge development, political consensus building, entertainment and personal relationships. The potential for future software connecting other applications and information virtually anywhere on the Internet, behind and outside the firewall, has the potential for transformative, cascading and ubiquitous applications. This has the potential to drive a raft of new companies offering new high value services, which will bring us to the next market development and capitalization stage.

The Challenges

Dramatic change brings dramatic new problems. How effective we are at solving them will affect how big this next wave will be -- or whether it will become just a ripple. Among these challenges:

Business Models. This challenge is greater than merely avoiding the profitless business models of the last decade. The value chains in a highly connected world will be complex and will deliver enormous value to the end user. We must be a great deal smarter about extracting a sustainable share of that value for the companies, and their investors, at each point in the chain.

Crossing the Chasm, Convergence and Market Development. The new entrepreneurs will have to cross the chasm again. In fact, they will need to cross it multiple times as the technology will come in multiple and converging parallel waves. Failure to understand your position in the

multiple market and product development cycles can be fatal (witness the telecommunications sector). Timing and positioning are critical. This also poses a challenge to the development community -- timing will be critical in capitalization.

Regulation. The potential for ubiquitous interconnections will pose tremendous new regulatory issues in security, privacy and commercial codes. We are already seeing some of these challenges, and the heavy price we pay for unviable solutions.

Intellectual Property. We have just begun to deal with the Napster-like problems of new content delivery and IP. The interconnected world of cascading applications and ubiquitous content envisioned here will increase that complexity by an order of magnitude.

Investment Protection and Competitive Models. This model is predicated on a system of interconnected services that is more open and less proprietary. Competitive methods that were available to protect market positions in the former, more proprietary world, will become less viable. The potential for new value creation will be great; but monetizing and protecting that value will require new business creativity.

The opportunities generated by this new paradigm of Internet development are virtually unlimited. So are the challenges.

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This article was written for publication in the March, 2002 edition of Mantran magazine.

