

What is your Web 5.0 Strategy?

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“The future is already here...[it’s] just not evenly distributed.” William Gibson

In this column, I look at the uneven present and the past to frame how the World Wide Web (WWW) will evolve and influence corporate strategy. I believe the WWW and Internet applications are evolving through five distinct stages to transform businesses. Each transition demands critically different strategic responses from companies.

Web 1.0: The Basic Publishing and Transaction Medium

The early WWW was a very limited medium. It was fundamentally a publishing medium for hypertext documents, which over time, included multi-media objects. The integration of the WWW infrastructure to databases and the ability to dynamically create web pages allowed the WWW to also become an efficient transaction media. Companies like Yahoo, Lycos and Google developed search functions and portals to information. Companies like Amazon and eBay enabled eCommerce, the sale of goods and services on the Internet.

In this period, every major company had to develop a WWW strategy to publish corporate information, communicate with various stakeholders, and enhance internal publishing and communications. Managers also had to decide the role of the WWW as a channel to customers and select either a direct or intermediated selling strategy. These changes forced companies to reframe their customer value propositions in terms of content and channelsⁱ.

Web 2.0: The Social and Co-created Web

Beginning in the late 1990s, we saw the emergence of Web 2.0. This was characterized by a fundamental shift in how content and value was socially and collaboratively co-created by the usersⁱⁱ of the WWW. In Web 2.0, the Internet became a collaborative platform where companies could use the collective power of distributed users to capitalize on data access and network effects (the “Long Tail”) that create extraordinary valueⁱⁱⁱ. Web 2.0 applications like YouTube, Facebook, LinkedIn, deli.cio.us, and Wikipedia all use the contributions of thousands of users to constantly improve content and innovate.

This era’s central strategy question asked managers how to modify business models to tap the value of user-generated content and leverage the “Long tail” to realize extraordinary gains from scaling the impacts of individual contributions. As users collaborate, share information, and aggregate bargaining power, the increased

transparency can also create new management challenges. Users are able to negotiate better prices, use reverse auctions and create social movements to pressure company leaders. Web 2.0 presages the need to deal with transparent markets.

Web 3.0: The Semantic and Intelligent Web

Today, the WWW is transitioning to a third stage: the Semantic Web. The semantic web combines human and increasingly available machine intelligence to make information more rich, relevant, timely and accessible. For businesses, some of the key components of Web 3.0 include better descriptions of web resources through mark-up languages like XBRL (eXtensible Business Reporting Language). For example, corporate disclosures that are marked-up with semantic XBRL tags allow users to quickly and seamlessly extract and compare information across companies. The power of XBRL to enable quick comparisons of information is illustrated by some of the applications of EDGAR Online. As grid and cloud computing, comes to the fore, and Moore's Law enables more powerful processors more are resources available for computationally intensive machine learning applications, Machine learning algorithms can then be applied more easily to WWW data to dynamically synthesize useful information. An illustrative prototype application that illustrates this is PhotoSynth. In this web applications many users can contribute their digital photographs of an object like the Duomo in Florence. PhotoSynth then automatically compares photographs and synthesizes a richer photographic representation of the objects in the photo such as a panoramic view^{iv}. Going forward, applying neural networks, genetic algorithms and other machine learning tools to user-generated content will accelerate and expand the insights derived from the WWW.

For businesses, the Semantic Web demands greater attention to analytics and exploiting computation to create differentiated insights from corporate and user-generated data. Investments in analytic capabilities will position firms to exploit data and information for competitive advantage. As transparency increases, management will have to focus more energies on communicating and trust-building with multiple stakeholders in a noisy world.

Web 4.0: The Mobile, Machine and Object Web

From Web 1.0 to 3.0, most of the information processed is direct, user-generated content that is processed by ever increasing computing power. Today, the proliferation of wireless communications enables another major transition: the ability to connect people and objects anytime, anywhere in the physical and virtual worlds. The widespread addition of objects to the WWW provides another level of user-generated content and analytic services. For example, imagine driving to your office in a car that knows your current location and destination from its GPS system. By analyzing information from many different cars sent to a cloud of computers through wireless services, the automobile's GPS system can come back with suggestions to improve your route to work by analyzing real-time traffic patterns. This could help commuters avoid traffic jams, conserve gasoline, and increase energy efficiency. Perhaps one day, the car will drive by itself, using the most efficient route between two points. Similarly objects may be used to unobtrusively monitor your health or the safety of your property. Information from the

objects will be processed remotely suggest interventions that improve safety in real time. The information will be sent to a cloud, analyzed, filtered and responded to as needed.

Another characteristic of Web 4.0 will be the increased real-time integration between individuals and the virtual worlds and objects they interact with. Whether it's Webkinz or Second Life avatars, individuals are increasingly likely to live in and multitask through physical and virtual worlds. Haptics — where objects and interfaces can give us different touch sensations — represent another major advancement in this field. Already, cell phones with locator devices can pull us toward a store.

The central challenges for strategists in Web 4.0 will be to devise strategies to fully exploit the integration of physical and virtual objects with other user-generated content to create value. This may be to frame the next generation of SCADA (Supervisory Control and Data Acquisition) applications or to generate value from entertainment that combines information from objects and humans. Many applications integrating real and virtual objects with users have yet to be imagined.

Web 5.0: The Sensory-Emotive Web

For the most part, the WWW is an emotionally flat environment. Sure, a contentious blog may stir-up anger that leads to a “flaming debate” on a website, and YouTube videos might make you laugh, but the Web is not a real-time, emotionally responsive space. It does not know your emotional state or your receptivity to specific information. The lack of emotional awareness limits the potential of the Web. After all, people are “feeling” beings in addition to “thinking” beings, and as the behavioral economists have shown, they do not always think or behave rationally.

Today, we are at the threshold of Web 5.0, a quasi emotive web that is more aware of your feelings. For example, the www.wefeelfine.org combs newly posted blogs for the phrases “I feel” and “I am feeling”, categorizes them, and maps the frequency and location of clusters of feelings. As a result, users can find data-supported insights into questions like “What are the most representative feelings of female New Yorkers in their 20s who post on the WWW?” or “What are the guiltiest cities in the world?” or “What do people feel in Baghdad right now?”

Emotiv, a San Francisco based company takes this one step further. They can sense the neurological activity using non-invasive EEGs. Coupled with other indicators such as blood pressure, they can assess various physiological and neurological states of the user. The headset can also be trained to control the expression of objects on a screen or a software game. These signals can be used to directly control software or real objects intermediated by an online channel. Emotiv represents a major shift in the future of human interfaces to the WWW. While some companies claim they can map feelings in real time, this is a bit of a misnomer. Emotions are complex and feelings like love, anger and happiness are difficult to map in the brain, even with an FMRI^V. Instead, today's technologies measure some of the effects of these emotions. Nevertheless, our advances in human machine interfaces push us to new vistas of interaction.

In Web 5.0, the next managerial challenge will be to truly tailor interactions to create rich, emotionally-resonant experiences for users. Today, we see glimpses of this in online gaming environments. eCommerce will have to adapt even more to customized, real-time communications with users. Web 5.0 will also put new demands on advertising, a major source of revenues on the Web. It too will be more targeted to the user's level of arousal and receptivity to information. As with every prior transition, the sensory-emotive web has the potential to change the WWW from a noisy environment to a richer place of thoughtful and affable interactions. It could also become a manipulative and disruptive space for individuals. Time will reveal how we use these new capabilities.

ⁱ Kambil, Ajit. *Doing Business in the Wired World*, IEEE Computer, May 1997 (Cover Feature)

ⁱⁱ Kambil, Ajit, Friesen, G. Bruce & Arul Sundaram, *Co-creation: A New Source of Value in the eEconomy* Accenture Outlook Magazine, June 1999

ⁱⁱⁱ Anderson, Chris (2006). *The Long Tail: Why the Future of Business Is Selling Less of More*. New York: Hyperion

^{iv} Visit labs.live.com/photosynth/ for more information

^v Kagan, Jerome (2007), *What is Emotion: History, Measures and Meaning*, Yale University Press