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How We Connect Defines Who We Are

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Industry pundits have suggested that we are living through the most significant network revolution in history. Most of the preceding societal changes enabled by print, transportation and electronic communication had significant revolutionary impacts in their respective times. In theory, the digital changes of today should really be no different.

But they are.

Connecting through history

Our own network revolution has affected every nook and cranny of our economy, as well as the way we interact and connect on a global scale. And throughout, how we connect is defined by our combined user experience. How we connect has become a definition of who we are.

From the beginning of the human experience until the Middle Ages, communication was defined by storytelling and an oral tradition. The invention of the printing press by Gutenberg was certainly a second revolution and was the earliest form of content distribution. At the time, information was unleashed at unprecedented rates via the rudimentary networks reliant upon distribution of books and printed material.

The next great network revolution occurred almost simultaneously in the mid-19th century. The introductions of both the railroad and the telegraph and later the telephone meant instantaneous communication was now possible across wide distances. Skipping ahead a century, we see that modern corporations or, for that matter most human interaction, came to rely on the marshalling and curating of these communications.

Finally, most recently, communications and information in the form of sound and video has been harnessed on a multi-point basis to connect homes, offices and automobiles over the last three decades. By reaching citizens on a point-to-multipoint basis, broadcasting overcame the

inefficiency of previous point-to-point systems. Connecting the nation's homes, offices and automobiles, over-the-air services created a global platform for shared human experiences, user expectations and the user experience.

Another mini-revolution is the pace at which user expectations have evolved. It took well over 60 years for less than half of people in advanced economies to adopt the revolutionary technology we call the telephone, but only 10 years for the same percentage to adopt the smartphone. Now, 76 percent of people in advanced economies own a smartphone.

Over the last couple of decades, the digital revolution has directly contributed to the size and scale of organizations (including network providers) as well as contributed to the ability for smaller players to take on the larger ones—all good things.

This thumbnail history shows that the power of the network has never been the network itself, but what the network's connections enable. And it is these networks that redefine economies and reshape individual lives. Network technology takes us along for the ride on its path of technological advancement, acceleration and low latency.

High-end user expectations

Wireless distribution of digital information represented the first time in history that the user commanded the information he or she needed. Mobile information retrieval and its proximity to the network, sometimes via Edge computing, for example, empowers the user to order the delivery of whatever information he or she wants to the place where it may be most productively consumed.

In the digital age, innovative enterprises win big by rethinking how to deliver the best experience for their users. For an enterprise to maintain its competitive edge, user experience is everything—whether in streaming a video, a business application, mobile app, cloud-based game, or on devices. Today's users also demand speed: they want to be able to leverage the latest technologies, including the most power-intensive ones, and they want them to be available wherever and whenever they want.

Against this backdrop—and especially as working from home has become more commonplace as the 'new edge'—industries that had not previously embraced next-generation technologies are now seeking to move swiftly into digitization. However, while the digital economy is rapidly creating new business opportunities, it also brings specific challenges.

Technologies such as IoT, Artificial Intelligence (AI) and machine learning, augmented and virtual reality (AR/VR), and robotics are increasingly being deployed to help companies gain a competitive advantage and remain relevant. While progress is positive, these technologies also bring issues of latency and other challenges that a centralized data center architecture cannot adequately support. This, in turn, can have a negative impact on the overall user experience.

To tackle the technological impediments, for example, edge computing is used to interconnect enterprises with cloud, content, and other service providers for latency-sensitive consumer and business applications.

Reinvention through positive user experiences

Healthcare and education are two examples of how evolving, more UX-friendly networks can solve legacy network problems. As medical success permits people to live longer, it also expands the opportunities for health problems. The most expensive way of treating these problems is in the hospital. The new networks create the opportunity to transform medical treatment from an experience dealing with a presented problem to a preventive experience that anticipates the problem and prevents or mitigates it—all at significantly lower cost. They offer, in other words, a combination of the bigness of scale economics with the personalization of the individual design. End-result: positive user experience.

These new approaches also shape the manner in which we educate. The legacy experience was a lecture followed by isolated individual homework in which the student tried to apply the concepts of the lecture.

Our network evolution now permits students to watch the common lecture on a connected device alone and at their own paces. They can stop as needed to repeat something that was not clearly understood. Then the student comes to class, where the teacher can personalize instruction based upon the student's comprehension of the lesson and where the irreplaceable stimulation of collegial discussion can be hosted. Studies by Carnegie Mellon University's Open Learning Initiative have shown that such programs blending online learning with in-person instruction can dramatically reduce the time required to learn a subject while greatly increasing course completion rates. Of course, these ideal pedagogical approaches will need to be tabled until the pandemic passes.

The new networks can create a richer in-school experience. The model falls apart if a student cannot gain access to the Internet at home.Similarly, if students do not have access to a high-speed Internet connection at school, their learning experience is further constrained. Here, as well, the user experience must be top-of-mind.

Economically, networks have always been growth engines, and information delivery networks are the new economy. And the discerning user in the new economy comes in all stripes. In the world of data centers, for example, the legacy approach that focused on centralized data centers and core networks created too many challenges around capacity, lower latency and cost. Enter the edge data centers that can move computing and data storage closer to the end user, enabling higher capacity, lower latency and reduced expenditures.

In addition to cutting costs, a distributed, user-experience-friendly architecture enables users to better align supply with demand. These customers "peer at the edge"—and local gateways enable high-speed connectivity between edge deployments as well as to and from the core network.

Taking the data center example a bit further, connectivity also plays a part in ensuring low latency, critical to the user experience. But regional cloud architectures mean slower performance away from local nodes. There, connectivity solutions like cloud on-ramps can provide tremendous efficiency.

Making the human connection

Our networks have never been more critical to our well-being. The industrial economy has been replaced by the information economy, predicated on the operation of information networks. From healthcare to education to enterprises harnessing the Internet of Things or artificial intelligence,

the growth networks of our economy rely both on core information networks and how closely those networks can touch the user—and positively affect the user's experience.

In the end, it will not be technological advances that will be the measure of network evolution but rather the uniquely human connections they enable.