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Israel and the "Bandwidth Economy"

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Whenever we discuss technology investments we need to distinguish our holdings from the Israeli start-up scene. Start-ups are usually focused on a single new technology seeking to displace established products or fulfill unmet needs in the marketplace. Start-ups often spend large sums of capital before reaping any profits, which can generate big gains for their investors but also high failure rates. Larger, profitable companies with publicly traded stock typically have competitive advantages relative to start-ups including retained earnings, customer relationships and capital for acquisitions.

Most Israeli IT companies are niche players, often complementing the capabilities of "platform" companies such as Cisco Systems, Intel, Oracle or other IT behemoths. The Israeli military has a history of adapting existing technologies for its needs and spawning entrepreneurial commercial enterprises. Israeli IT companies participate in a variety of fields such as software, semiconductors, cyber-security, defense technologies and wireless systems.

A number of Israeli IT companies are benefitting from the explosion in data communications. They sell products to overcome "bandwidth bottlenecks" in the global communications system. With the proliferation of computing devices, and our growing consumption of data intensive services such as video, our communications networks are straining to meet rising expectations. Bottlenecks can be found at every segment of the data communications network, from the massive data centers operated by Google or Amazon to the sometimes frustratingly slow speeds on consumer devices.

IT companies are shifting toward a vision of "cloud" based services where we interact with powerful computers across the internet, storing our content for ready access by any device anywhere. Unfortunately we often encounter limitations due to latency, capacity, cost, quality, functionality and a host of other factors that depend upon the speed of our connections. A number of Israeli companies sell

technologies that facilitate ever faster data communications. Just like the railroad build-out of the 19th century, Israeli IT companies are selling solutions equivalent to the locomotives, box-cars, ties, switches, and signals, but typically not operating the railroad system.

The Data Explosion

The term "bandwidth" is used to define the data transfer rate between devices in a computer network, expressed in bits per second (bps). Since the internet entered our lives twenty years ago, we are now all familiar with the "speed" of our various computer network connections. Initially we used "dial-up" modems that connected our computers through copper telephone wires at 56 kbps (56,000 bits per second). Soon thereafter the cable television companies offered "broadband" connections at 1.5 Mbps (1.5 million bits per second), blazing fast speed at the time. Today a basic consumer broadband plan typically provides download speeds of 25 Mbps while a top tier package delivers 105 Mbps.

Broadband once referred to a PC plugged into a wired network. Today our demand for greater bandwidth encompasses all of our devices, including mobile phones and tablets. In a few years, pundits predict we will utilize a variety of internet enabled wearable devices or experience the "internet of things". In addition to Facebook friends we will communicate with our washing machines and dishwashers as well. Sensors sprinkled around the globe will provide a variety of real time information to those who depend on it. All of these current and future applications are fueling an astonishing explosion in data communications.

Cisco Systems, the world's largest vendor of networking technologies, estimates that the total amount of internet traffic is currently 30 exabytes and will grow to one zettabyte by 2015. Come again? What is an exabyte? How about a zettabyte? An exabyte of data amounts to 36,000 years of high definition streaming video. A zettabyte is equal to 1,000 exabytes and one exabyte is equal to 1,000 petabytes. One petabyte is equal to 1,000 terabytes and one terabyte is equal to 1,000 gigabytes. To put things into perspective the iPhone comes with 16 or 32 gigabytes of memory, so 30 exabytes is approximately equal to the entire contents of 1 billion iPhones. Cisco uses the analogy that if a petabyte is equal in size to an 11 oz cup of coffee, then a zettabyte would occupy the same volume as the Great Wall of China by comparison. In the not too distant future we will run out of nomenclature to describe the quantity of data we communicate via computer networks.

Israeli Companies Alleviate Bandwidth Bottlenecks

While Cisco Systems and other large vendors service the major information highways, Israeli companies focus on the local roads and side streets. For example, Ceragon Networks sells wireless "backhaul" products for telecommunications networks. Once your mobile device connects to a cell tower, the information you communicate must then be combined with all of the other traffic and communicated in bulk with the carrier's network. A speedy, but expensive, solution is to link cell towers by fiber optic cables with massive capacity. Wireless backhaul has less capacity than fiber optics, but is also less expensive. One application for Ceragon products is to boost mobile device bandwidth by installing smaller cell towers in tighter geographies where fiber optic backhaul is impractical. Another application is in developing countries where fiber optics can prove expensive to install.

Another example is Mellanox, an Israeli company whose products increase bandwidth within data centers. Data centers are the lifeblood of the “cloud”. They contain massive arrays of computer servers and storage devices. Every Google search or Facebook post is a data center transaction. Mellanox computer chips speed up the communications between computers inside a data center. While the data center is just one node on the information superhighway, its efficiency is a crucial element enabling cloud computing.

The “Bandwidth Economy” Leverages Israel’s Strengths

The Israeli military adapts civilian technologies for defense purposes while spawning entrepreneurs with solid technological skills. This phenomenon created an ecosystem of Israeli companies focused on data communications. While a major platform company is yet to emerge in Israel, niche players are benefitting from consumer demand for faster download speeds, higher quality video and more data intensive services. Some companies are becoming sizable with greater financial heft, allowing them to compound their competitive advantages. Perhaps Israel will one day produce a dominant platform company like Cisco Systems, but in the meantime its many niche players are enabling the emerging bandwidth economy.