

Mitchell's Musings 7/25/11: Wires and Cables

In last week's musings, I noted the ending of the U.S. space shuttle program. Despite this evident retreat, there is a general public perception that technology is advancing rapidly, more rapidly than at other times in history. That view, it might be noted, is not borne out when one looks at official measures such as productivity growth (or total factor productivity growth). And, if anything, such measures are tilted toward overstating the recent pace of technological improvements (essentially computer/electronic-related) compared to earlier improvements. Much more effort has been put into making "quality" adjustments in output indexes for recent developments (which raise measured productivity growth) and not so much into older developments (tube tires to tubeless, operator-connected calls to dial phones).

I suspect that the public (and news media) perception has much to do with the proliferation of consumer electronics, iPhones, iPads, etc. Yet even electronic information technology developments and improvements are not new. Samuel Morse's telegraph of the 1840s was a dramatic development. It might be noted that he received an initial federal grant to demonstrate its feasibility via a connection between Washington and Baltimore. Once that demonstration succeeded, rapid sharing of news and information became possible, eventually producing a unified domestic marketplace as can be seen on this video:

[Early Telegraph Unites Domestic Market But Not World Market](#) or

<http://www.youtube.com/watch?v=DmolT6pl8eI>

As the video notes, however, telegraph technology was not available across oceans. Initial efforts at a trans-Atlantic cable – like the Morse demonstration - received government support, this time from both the U.S. and British governments. The resulting cable - laid in the 1850s - failed after a few weeks of operation. But Cyrus Field, the entrepreneur behind the effort, had at least shown that it was possible to send messages undersea for long distances. The issue, at that point, became figuring out the cause of the cable's failure (it essentially burned out due to excess current) and ways to avoid a similar failure in the future. In 1866, he succeeded in laying a second cable that worked, thus setting the stage for a worldwide integration of news and markets – globalization! – as celebrated in this second video:¹

[Telegraph cable across Atlantic](#) or

<http://www.youtube.com/watch?v=n6PXf8YnjV4>

¹ Although the soundtrack says the cable was "wired into the North American grid," I doubt that was possible. The trick of success in the second cable was to produce a signal detector that could respond to the extremely weak signal that arrived, since amplification was not possible. It is more likely that a message was received, decoded, and retransmitted – by hand - through the North American grid.



George Ottinger: Last Ride of the Pony Express

The new information technology also made possible an expansion of an existing technology at the domestic level, railroads. California – during the Gold Rush – was reachable from the east by covered wagon (a potentially dangerous journey), by sailing ship around South America (there was no Panama Canal), or by ship to Panama, overland to the Pacific, and then ship again to California. But the California economy in the second half of the nineteenth century was ultimately to be based on agriculture, not gold. To transport farm products, the Gold Rush routes were not practical. Congress, in what was probably the most important “public-private” partnership of that era, provided subsidies and land incentives to build the Transcontinental Railroad. If you listen to the soundtrack of the video below, there are mentions of the telegraph being used to send the signal across the country of the railroad’s completion in 1869:

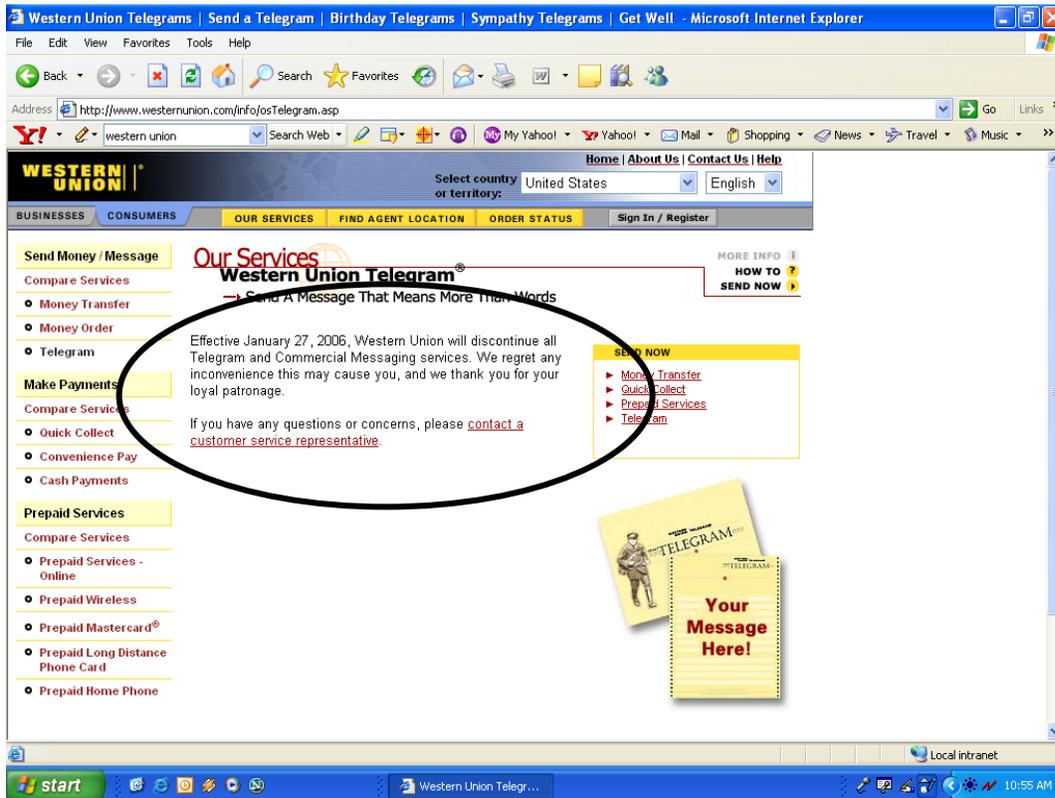
[Completion of Railroad to California](#)

<http://www.youtube.com/watch?v=hcAollyw9i0>

But that description and use vastly understates the importance of the telegraph to the rail venture. If you have a one-track railroad with trains going over long distances in both directions, you better know where your trains are. The telegraph made possible the cross-continent railroad by creating the capability of monitoring train location from afar. The railroad, by being able to move goods as well as people, completed the unification of the national market.

Grand projects of the sort undertaken in the nineteenth century continued with various motivations in the twentieth. Sometimes the motivation was military and political. The transcontinental railroad was underway during the Civil War and its symbolism of unification of the country in the face of evident division was an important part of the motivation.² The federal interstate highway program begun in the 1950s was justified on the basis of national defense. And, of course, the space program was very much a product of the Cold War.

While there is talk today about fostering the jobs of the future, discontinuing the space program and lack of interest in funding infrastructure (beyond short-term stimulus), does not suggest that a 21st century equivalent of the telegraph is on the agenda here. Years ago, when asked about making films with social significance, movie mogul Sam Goldwyn was supposed to have said, "If you want to send a message, call Western Union." Nowadays, you can still call Western Union, but – with the telegraph a thing of the past - you can't send a message there; you can just transfer money. And our collective message on producing the innovations that actually will produce the jobs and workforce of the future seems to be "don't call us."



² Building railroads to unify countries over large areas was not exclusively an American idea in the 19th century. The Russian czar saw the construction of the Trans-Siberian railroad in the same light. Much more recently, the new Chinese rail link to Tibet can be seen similarly.