



Real Time Economics

Economic insight and analysis from The Wall Street Journal.



ECONOMY
5 Things to Watch on the Economic Calendar



ECONOMY
Why Wealth Inequality Is Way More Complicated Than Just Rich and Poor

- MINIMUM WAGE
- EMPLOYMENT
- INFLATION
- FED
- EDUCATION

HOT TOPICS: WSJ ECONOMIST SURVEY JOBS EDUCATION INEQUALITY

1:00 pm ET
Mar 20, 2015 U.S.

50 Million Users: The Making of an 'Angry Birds' Internet Meme

ARTICLE

COMMENTS (2)

MEDIA TECHNOLOGY

Email Print

Facebook 114 Twitter

By TIMOTHY AEPEL CONNECT

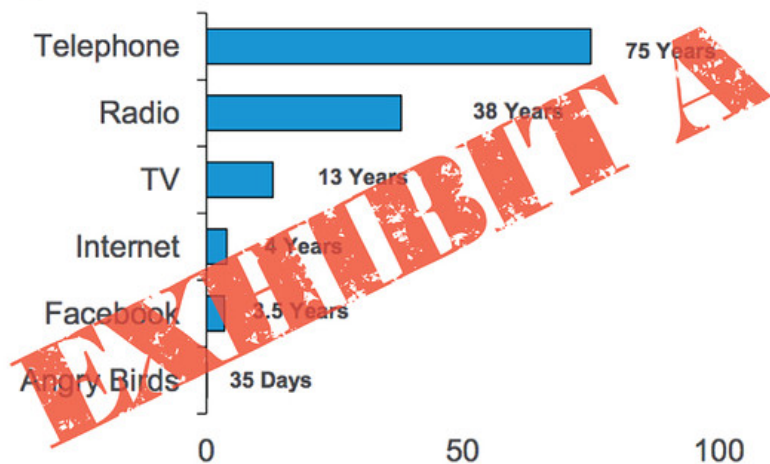
Everyone knows the Internet spread like wildfire. But did it really sweep America that much faster than radio or television?

The answer is highly debatable. But that doesn't stop a "fact" from sweeping across the Internet, as we found here at Real Time Economics with [a recent look at technology diffusion](#).

Last week, we described [a 100-page report on innovation and jobs](#) written by two **Oxford University** economists that cited an eye-catching metric: It took 75 years for telephones to reach 50 million users, while the app "Angry Birds" hit that goal in 35 days. An accompanying chart showed radio took 38 years and TV 13 years. The numbers looked precise enough to appear like they were thoroughly researched.

They weren't.

Figure 5. Time to reach 50 million users



Source: Citi Digital Strategy Team

As we [discussed a bit last week](#), those metrics can be misleading.

For starters, the chart botches the basic rule of apples-to-apples comparison. The gauge

PREVIOUS
College-Savings Accounts Could Be a Key Tool For Reducing Student Debt, New Research Says

NEXT
Mexican Central Bank Leaves Door Open to Act Before or After Fed

SEARCH REAL TIME ECONOMICS

GO

Latest Economy News

About Real Time Economics

Real Time Economics offers exclusive news, analysis and commentary on the U.S. and global economy, central bank policy and economics. Send news items, tips, comments and questions to realetimeeconomics@wsj.com.

Learn more about the team and follow us on Twitter.

Read more [WSJ Economics coverage](#).

Sign up for the [Real Time Economics daily newsletter](#) and follow [@WSJecon](#).

Sign up for [WSJ Pro Central Banking newsletter](#). Follow [@WSJCentralBanks](#).

Follow Real Time Economics on Twitter

Real Time Economics Categories

Fed	5361	ECB	1283
Global	4495	central banking	1264
Credit Crisis	3742	Federal Reserve	858
Employment	3315	U.S.	814
Business Cycles	2764	GDP	778
Consumption	1873	Economy & Business	737

for telephones, radio and TV appears to be the number of U.S. households with that technology, which is tracked by the **U.S. Census Bureau**, while the Internet, Facebook and “Angry Birds” numbers include users of all types, although it isn’t at all clear exactly what’s counted.

In fact, the word “Internet” itself is problematic. The roots of the Internet go back decades, when military and academic researchers began knitting together computer systems. But it was only later that the World Wide Web was created and spread quickly to millions of users.

And about that “50 million” milestone: The U.S. didn’t even have that many households until the mid-1950s, so this guarantees earlier inventions like the telephone took far longer to reach them. A more meaningful comparison would be how fast a large share of the U.S. population at any given time embraced it, and not just in their homes but everywhere. Most Americans got their first taste of the Internet at work—connections at home came later.

Of course, not all inventions are created equal. Apps like “Angry Birds” can ricochet through cyberspace to millions of users—because there’s a system in place that allows that, says **Scott Stern**, an economist at the **Massachusetts Institute of Technology** who studies technology diffusion. Building a telephone system required stringing wires and building sprawling exchanges. Naturally that’s slower.

The irony is that the basic idea behind the chart probably isn’t wrong.

“New technologies are diffusing faster than older technologies—but the Internet isn’t special in that regard,” says **Diego Comin**, a **Dartmouth** economist whose specialty is tracing how technology spreads globally. His research, for instance, shows health breakthroughs like heart and kidney transplants have spread nearly as fast.

But this particular meme’s troubles run deeper.

It turns out many of those figures about technology diffusion—from the telephone to “Angry Birds”—have a squishy foundation. Indeed, variations have been floating around for nearly two decades, though you wouldn’t know that from the chart offered in the Oxford economists’ report, “The Future of Innovation and Employment.”

Inflation	1695	Budgets	732
Economy	1565	Vital Signs	651
Trade	1509	Monetary Policy	640
Housing	1382	Manufacturing	633

Deloitte.

DOWNLOAD REPORT: *Risk Sensing*

© 2015. For information, contact Deloitte Touche Tohmatsu Limited.



James BonTempo
@jamesbt

Follow

To reach 50 million users: telephone - 74 years, radio - 38 years, PC - 16 years, television - 13 years, WWW - 4 years
<http://is.gd/12OJ>

2:45 PM - 24 Jul 2008



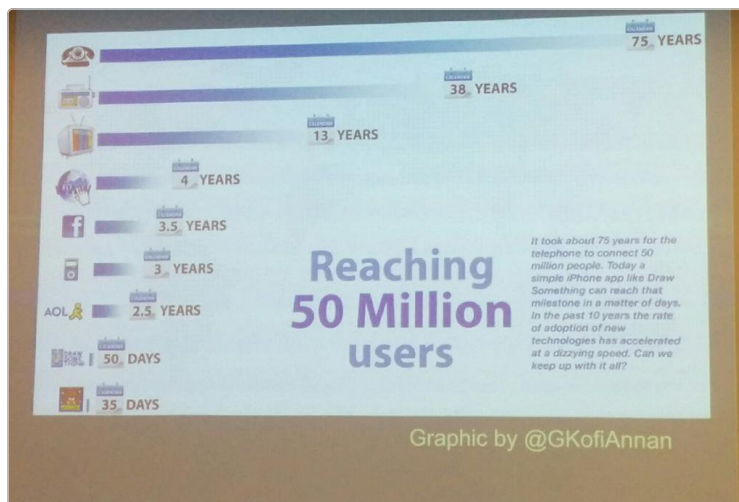
Esther Jacobs
@estherjacobs

Follow

Interesting... Years it took to reach 50 million users: Radio 38 years. TV 13 years. Internet 4 years. Ipod 3 years. Facebook 4,5 months!

7:35 AM - 13 Dec 2010





QuickLearnr
@QuickLearnr

Follow

How long it took these services to reach 50M users. Telephone - 75 yrs vs Angry Birds Space - 35 days #sreeldn @sree

1:41 PM - 30 Sep 2014

2

The economists' report said the chart was the handiwork of the digital strategy team at Citi GPS, which published their work and contributed to its contents.

We posed questions to Citi about its origins. **Sandeep Dave**, a member of Citi's digital strategy team, replied via email that it actually came from **Kofi Annan**, "and therefore I am inclined to believe that we may have used a U.N. report. Unfortunately, I am not sure which report." He added that Citi shouldn't have credited the chart to his team.

But Kofi Annan? The former secretary-general of the United Nations for nearly a decade?

The link Mr. Dave forwarded wasn't actually from a United Nations report. The **G. Kofi Annan** who created the chart Citi says it borrowed is no relation of the Ghanaian diplomat who led the U.N.

"People ask me that all the time," Mr. Annan chuckles. He's a New York-based technologist and writer. When reached at the SXSW conference in Austin this week, he said the chart is a "mashup" of material he collected online, such as a report from [the Council on Competitiveness](#) (which, in turn, cites [a video embedded in a real estate agent's blog](#)). A report from [an energy-saving group](#) he provided cites a different Facebook stat than the one in the chart, based on how long it took the social media site to go from 100 million to 200 million users. (Less than nine months, the report says, [citing Mashable](#).) The "Angry Birds" statistic, Mr. Annan said, came from articles he read on [The Verge](#) and [Engadget](#).

But there's a problem with that, too. "**Angry Birds**" **actually took a year** to reach 50 million downloads, according to its creator. It was "Angry Birds Space"—a later variant—that **achieved the milestone in 35 days**.

It turns out the "50 million" meme has a long and colorful history. **Gisle Hannemyr**, a Norwegian computer scientist, has made tracking its origins a bit of a hobby. He says he first noticed comparisons of technology diffusion rates that used the 50-million-user threshold in 2001. So he started collecting references. In 2003, he published a paper on the topic, titled "[The Internet as Hyperbole](#)."

He believes the first use of the 50-million-user threshold to compare technology adoption was in a 1997 **Morgan Stanley** report on Internet retailers. Its lead writer: **Mary Meeker**, who rose to prominence during the dot-com boom as a stock analyst. A bar chart in the report compares the "Number of Years for New Media To Reach 50 Million U.S. Homes"—and shows 38 years for radio, 13 years for TV, 10 years for cable television and an estimated five years for the Web.

It uses the same numbers for radio and TV as the recent Citi chart—but for the more accurate "homes," not "users." Mr. Hannemyr still had concerns.

"The numbers may not [have] been totally made up (as I previously believed), but may originate from a very confusing use of terms and also comparing apples to oranges," he

wrote in an email. Reached in Norway, where he's a lecturer on informatics at the **University of Oslo**, he says he contacted Morgan Stanley at the time, but the bank didn't explain how it made the calculations.

The report cites two sources for the data in addition to Morgan Stanley Technology Research. **Paul Kagan**, who then closely tracked cable TV, says he provided numbers on that sector. **McCann-Erickson**, which then issued twice-yearly reports on advertising spending, is also cited, but a spokeswoman says she's unsure what the company contributed.

The meme quickly spread. Mr. Hannemyr found a 1998 report from the **U.S. Department of Commerce** entitled "**The Emerging Digital Economy**" that used a variation of the statistics, citing an "Internet Shopping" report from Ernst & Young LLP and an article for growth on online computer stores from Interactive Age Digital.

"The Internet's pace of adoption eclipses all other technologies that preceded it. Radio was in existence 38 years before 50 million people tuned in; TV took 13 years to reach that benchmark.... Once it was opened to the general public, the Internet crossed that line in four years," the Commerce report said.

A "50 million" stat showed up in a report prepared for the **European Commission**. Not long after, a bank report from Singapore used the numbers, but ascribed them to Asia. In an added twist, the factoid also appeared in a publication produced by the United Nations in 2000—attributed to none other than Kofi Annan, the diplomat. A representative of the office that produced the report says, "The report doesn't cite where that particular statistic came from—so finding it 15 years later . . . would be difficult."

The "facts" lived on for decades. A **white paper published by Intel Corp.** in 2012—and **updated in 2014**—includes Mr. Annan-the-diplomat's figures. It also references other sources, including a blog that included its source as "**original source is unknown.**" That blog referred back to a site called The Southern Cross ("Southern Africa's Catholic Weekly"), which published a first-person account of the figures in 2009 without further attribution.

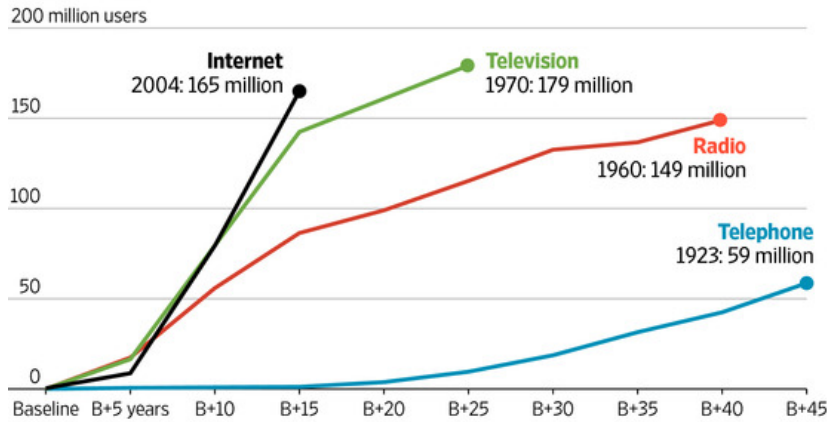
As part of Mr. Hannemyr's somewhat quixotic quest, he did his own comparisons—mostly relying on U.S. Census data on the diffusion of technology in households. He sought to translate the comparison to individuals, to make the comparison more fair. He **spells out his various adjustments in his paper.**

One of the biggest problems in tracking the diffusion of technology is deciding when to mark the start of a new invention. The Internet is a particularly tricky one. Mr. Hannemyr figures there are at least seven different points in time that could be considered the start of the Internet, beginning with the 1964 invention of packet switching by RAND researcher **Paul Baran.**

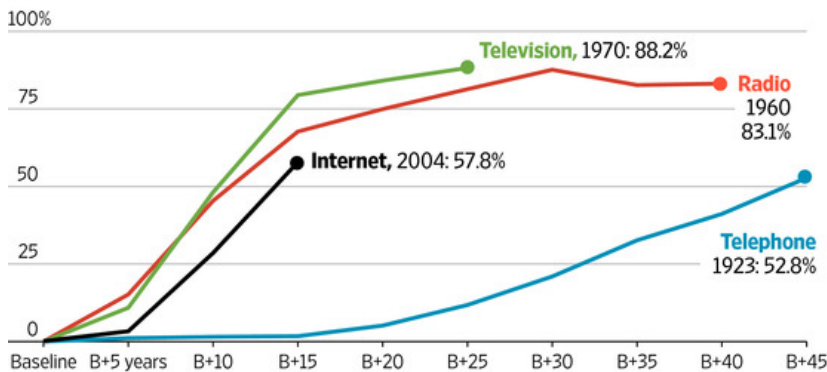
He settled on 1989 for the start of the Internet, which is when the first commercial Internet service providers started operations in the U.S. The upshot is that the Internet doesn't appear to have spread that much faster than some of its predecessors: He figures it took less than a decade for radio, television—and the Internet—to acquire 50 million individual users.

But he also checked what happens when the figures are adjusted for changes in population. As America developed and the population grew, it became easier to reach 50 million people. By that gauge, he concludes Internet adoption was actually a bit slower than for radio and television.

Technology By Users Over Time



Technology Use By Percentage of Population Over Time



Note: Data as of 2004. Base years: Telephone, 1878, first commercial telephone exchange; radio, 1920, first public radio station; television, 1945, postwar production of TV receivers; Internet, 1989, first commercial Internet service providers. Mr. Hannemry's data for non-Internet media stop after they near the Internet's 2004 user-base of 165 million.

Source: Gisle Hannemry, author of "The Internet as Hyperbole: A Critical Examination of Adoption Rates" **THE WALL STREET JOURNAL.**

Shane Greenstein, a professor at Northwestern University's **Kellogg School of Management** who is writing a book about the economic history of the Internet, says it's useful to remember what was going on in the world when Ms. Meeker published her report in 1997. "In comparison to the extreme hype of the late 1990s, she was actually more grounded," he says, noting that she often included cautionary language in her reports that Internet growth would eventually slow.

The report predicted that the Internet would reach 50 million users by 1999.

Mr. Greenstein says the meme could be another example of "Internet exceptionalism," the idea that Internet businesses don't follow the same set of economic principles that govern other kinds of business.

Meanwhile, we asked Morgan Stanley whether it could provide data to support that original 1997 report. "That was 18 years ago," said a spokesman, who has yet to respond beyond that to our request. We also reached out to Ms. Meeker, but she has not responded.

No matter. The meme has long since passed into the realm of too good to check.

Related reading:

[It Took the Telephone 75 Years To Do What Angry Birds Did in 35 Days. But What Does That Mean?](#)

[What Clever Robots Mean for Jobs](#)

[Be Calm, Robots Aren't About to Take Your Job, MIT Economist Says](#)

[The Robots Are Coming for Your Paycheck](#)

[This Wasn't Written by an Algorithm, But More and More Is](#)

Follow @WSJecon 688K followers for economic news and analysis
Follow @WSJCentralBanks 73.3K followers for central banking news and analysis

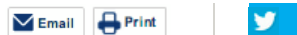
Get WSJ economic analysis delivered to your inbox:

Sign up for the Real Time Economics daily summary

MEDIA TECHNOLOGY

PREVIOUS College-Savings Accounts Could Be a Key Tool For Reducing Student Debt, New Research Says
NEXT Mexican Central Bank Leaves Door Open to Act Before or After Fed

REAL TIME ECONOMICS HOME PAGE



SPONSORED LINKS

- 10 Best Cloud Storage Providers
- Best Annuity Rates
- Best Retirement Investments
- Safe Retirement Investments
- 2015 Stocks to Invest In
- High Interest Savings Accounts
- Luxury Cars 2015
- Affordable Midsize Crossovers
- Top 5 Hybrid Cars
- Real Estate Investing Advice

Add a Comment

NAME We welcome thoughtful comments from readers. Please comply with our guidelines. Our blogs do not require the use of your real name.

COMMENT

CLEAR POST

Comments (2 of 2) [View all Comments »](#)

6:16 pm March 25, 2015
Koyal wrote:
Why does people always play with the actual figure as in most case it's just wrong. It is the case with Forex trading too where most have figure that are over the actual mark. I believe in real facts and figures because in business that is what plays the biggest role. I trade with OctaFX and using their service makes me feel so happy because I get exactly what they say and I can trade with comfort. I use their low spread of just 0.2 pips, high leverage up to 1.500 and plenty of other benefits.

12:27 pm March 23, 2015
James Horn wrote:
1. The 50 million figure is imprecise. Is it US (based on US census figures? UK (Oxford researchers) or world wide?
2. The adoption of the telephone was conditioned partly on expensive infrastructure creation. IUtility poles needed to be installed and wire run. This was not so bad in areas of concentrated population but very expensive per user in rural areas. The Depression era Rural Electrification program may have played an equal role in spreading the use of phones through piggybacking on the powerline poles.,
3. The other items piggybacked on the existing infrastructure. The internet initially used phone lines, and the existing utility poles provided power; high speed internet access also often uses Cable TV lines.



[Subscribe](#)

[Sign In](#)

[Back to Top](#)

Subscribe

[Why Subscribe?](#)

[WSJ+](#)

[Corporate Subscriptions](#)

[Apps](#)

[Professor Journal](#)

[Student Journal](#)

Customer Service

[Customer Center](#)

[Live Help](#)

[Redesign Guided Tour](#)

Tools & Features

[Emails & Alerts](#)

[Guides](#)

[My News](#)

[Portfolio](#)

[RSS Feeds](#)

[Topics](#)

[Video Center](#)

[Watchlist](#)

Ads

[Advertise](#)

[Advertise Locally](#)

[Commercial Real Estate Ads](#)

[Place a Classified Ad](#)

[Sell Your Business](#)

[Sell Your Home](#)

[Recruitment & Career Ads](#)

More

[Conferences](#)

[Content Partnerships](#)

[Corrections](#)

[Jobs at WSJ](#)

[Make Time](#)

[News Archive](#)

[Register for Free](#)

[Reprints](#)