

# Voting machines and election systems - a quick look

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In this Dec. 6, 2013, file photo, a member of the Venezuelan National Electoral Council waits for a voting machine to charge during the preparation of a polling station in Caracas, Venezuela. Digital voting machines are in the spotlight in Venezuela, where a maker of election systems used in the country's tumultuous constituent-assembly election said Wednesday that the turnout figure had been "tampered with." That meant it was off by at least 1 million votes - possibly in either direction. (AP Photo/Fernando Llano, File)

Digital voting machines are in the spotlight in Venezuela, where the head of Smartmatic, a maker of election systems used in the country's tumultuous constituent-assembly election, said Wednesday that the official turnout figure had been "tampered with ." The company's CEO said the count was off by at least 1 million votes—possibly in either direction.

Tibisay Lucena, head of Venezuela's National Electoral Council, dismissed that allegation as an "irresponsible declaration" that might lead to legal action. The government-stacked electoral council claims more than 8 million people voted in the election for a nearly all-powerful constituent assembly. Independent analysts have expressed doubts at that number.

Here's a look at the technology and politics of voting [machines](#) and election systems.

## WHO MAKES VOTING MACHINES?

The voting-machine market is a speck in the prodigious tech sector. Iowa University computer scientist Douglas Jones estimates its annual revenues in the United States at less than \$200 million—roughly what Google pulls in every day. It's much harder to get reliable information about the fragmented global market for election systems.

The biggest U.S. player, ES&S, is private and has just 450 full-time employees. Because the U.S. voting landscape is so disperse and because it's controlled largely at the county level, it's not all that attractive to major corporations. One major player, ATM-maker Diebold, left the election-systems market a decade ago after computer scientists repeatedly identified vulnerabilities in its machines.

Although paperless machines that are essentially impossible to audit are

still used in 14 U.S. states, the trend is toward optical-scan machines that record votes electronically but leave a paper record. The machines used in Venezuela, supplied by Smartmatic, produce a paper record for each voter.

## WHO OVERSEES VOTING SYSTEMS?

The regulation of voting machines and tabulation systems varies by country. Usually, a national electoral authority certifies the voting technology used. Often, outside election observers sponsored by groups such as the Organization of American States monitor elections for irregularities.

In the U.S., individual states provide certification of voting equipment. The federal government plays only a loose coordinating role.

## HOW COULD TAMPERING TAKE PLACE?

Tampering is easiest when a voting [system](#) leaves no paper trail. That's one reason researchers want the U.S. to move entirely to [paper](#) ballots. Paper can't be remotely hacked, and makes it possible to audit election results after the fact.

Many advanced democracies require [paper ballots](#), including Germany, Britain, Japan and Singapore. The Dutch moved this year to the complete hand-counting of ballots.

If all counting at the local level is transparent—and the chain of custody of ballots is closely observed and monitored by impartial observers and participants—it's very difficult to tamper with an election even at the highest levels of government. An exception is if an outcome is extremely close.

## WHY WOULD A VOTING MACHINE COMPANY PUBLICLY ACKNOWLEDGE TAMPERING?

Blowing the whistle on a client might not seem very good for business. But an [election-systems](#) company might see no other option if it believes a government is making unrealistic claims about election turnout, as appears to be the case with Smartmatic in Venezuela.

Failing to speak out could make the company complicit in potential voter fraud. Sunday's [election](#) in Venezuela was internationally condemned as an unconstitutional power grab, and that criticism might have influenced Smartmatic's decision.

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