WASHINGTON—President Donald Trump has suggested he might find a way to cut the number of coveted H-1B visas awarded to outsourcing firms. But the companies appear to be heading in that direction all on their own, amid technological changes.

Outsourcers’ use of H-1B visas, which are reserved for highly skilled foreign workers, fell last year, before Mr. Trump won the Republican presidential nomination, new data show. The slide occurred alongside increasing criticism of the firms’ business model.

Mr. Trump has criticized the lottery that is now used, where companies all have equal chances at the scarce visas, and signed an executive order directing a review of the program. The order called for changes that would ensure visas are awarded to “the most skilled and the highest paid” applicants, to avoid crowding out American workers.

Six of the seven prominent Indian-based outsourcing companies that do work in the U.S. received fewer H-1B visas in 2016 than they did in 2015, and as a group their numbers dropped 37%, according to a new analysis by the National Foundation for American Policy, a think tank that backs increasing the total number of H-1B visas available. Most outsourcers based in the U.S. and elsewhere also saw declines.

For instance, H-1B visas awarded to India’s biggest outsourcer by revenue, Tata Consultancy Services Ltd., plummeted by 56% to 2,040 last year from 4,674 in 2015. For Wipro Ltd, another major Indian firm, the number also dropped by more than half to 1,474 from 3,079 in 2015.

Other research from previous years shows that the use of H-1Bs by individual outsourcing companies peaked in 2012 and 2013, sliding ever since. Many expect that the number of visas given to outsourcers will decline again for 2017, but those numbers aren’t yet available.

Meanwhile, the number of visas awarded to some large U.S. technology firms, who have a different business model and compete with outsourcers for visas, increased last year.
Amazon.com Inc., Microsoft Corp., Alphabet Inc.’s Google and Apple Inc. all received more visas than they did in 2015, the new data show. Such companies typically use the visas to recruit employees with rare skills that attract higher wages than staff employed by outsourcers, and have come under less criticism.

Each year, 85,000 H-1B visas are available, and for the last several years they have been awarded by lottery conducted in April because of overwhelming demand.

Following this year’s lottery, Mr. Trump criticized the process and suggested more visas should go to high-paid jobs as opposed to a lottery where each application has equal chance. Because many outsourcing jobs are paid the minimum required to comply with certain rules—around $60,000 a year—many interpreted Mr. Trump’s comments as a warning to the outsourcers and a possible boon to big tech companies that pay high salaries.

Outsourcing firms also have drawn scrutiny for importing foreign workers to do work once performed by Americans. The companies say they are adhering to the program’s rules and only hire foreigners because they cannot find Americans for the jobs.

Some Indian firms also say they are beefing up their hiring of people in the U.S. Infosys Ltd. last month said it plans to hire some 10,000 American workers locally over the next two years.

Stuart Anderson, who runs the foundation that released the new report, said that the falling numbers undercut critics’ arguments that the number of visas should not be increased because outsourcers are abusing the existing program.

“If their numbers are going to these low levels, then that excuse is no longer valid, if it ever was,” he said.

But Ron Hira, an associate professor of public policy at Howard University who has been critical of the outsourcing firms, said that thousands of visas granted to these firms are still substantial.

“How many careers were wrecked by those hires? Remember the business model is often used to replace U.S. workers,” he said. He added that some of these firms may now be bringing similar workers to the U.S. using other visa programs.

But the falling numbers reflect, at least in part, changes in the industry, as IT firms grapple with a rapidly shifting technological landscape.

In past years, these firms thrived by offering inexpensive solutions for relatively simple work, deploying armies of tech workers to undertake tasks like maintaining servers and updating software for clients. But demand for such work from many clients has been falling for some time.

One factor is the rise of cloud computing, which allows firms to do many technological tasks more easily in-house using web-based tools that are less labor intensive. Another factor is automation, which allows computers to undertake such work with little human assistance.
Meanwhile, many Indian firms’ clients have been cutting back on their IT budgets, which has been biting into Indian firms’ sales.

In response, Indian firms like TCS, Wipro and Infosys Ltd. say they are working to offer newer, so-called digital offerings, like artificial intelligence and big data analytics.

As Indian firms adjust to the new reality, the “transition from legacy to digital could be painful…for both growth and margins,” Nomura analyst said in a research note for investors last month. “Stay cautious.”