From Data to Decision-Making: Smart Diagnostic Tools Linked to Business Growth

STEP Campaign Case Study
Several studies have found that at least one energy-wasting fault exists in 70–90 percent of residential HVAC systems. Smart diagnostic tools can help HVAC technicians prevent, identify, and fix such issues.

Smart diagnostic tools are a suite of digital probes that transmit key HVAC system measurements to smartphone applications that enable commissioning and diagnostics. This ensures air source heat pumps, central air conditioners, and other residential HVAC equipment are installed and operating correctly.

With demand for heat pumps at an all-time high, and with an influx of federal incentives becoming available for heat pump installations, it is critical that these systems be installed and operate correctly from the start. Smart diagnostic tools can help contractors achieve this goal—and help training organizations upskill the HVAC workforce. This case study provides an example of how one company’s implementation of smart tools led to optimal system performance and customer satisfaction, along with significant business growth. It also highlights how the company is helping increase awareness across the industry by providing training on smart tools and preparing technicians for the growing HVAC field.

Smart Diagnostic Tools
Smart diagnostic tools combine digital HVAC diagnostic or commissioning applications and wireless probes to enable real-time fault detection and diagnostics during installation or maintenance of residential HVAC systems. Technicians place wireless probes on different components of HVAC systems to collect key measurements, such as air temperature and flowrates, refrigerant temperature and pressure, and electrical readings.

These measurements conveniently synchronize with the smart diagnostic application, which synthesizes the data to calculate system performance, run real-time diagnostics, and identify potential system faults in existing systems or commission newly installed systems. The smart diagnostic tools can also narrow down points of failure and recommend suggested adjustments or repairs. These tools check that the HVAC system measurements are within industry standard tolerances and that the system is performing optimally.

Once a system is verified, a technician can easily benchmark system performance and save it to a customer’s file. If there is a problem in the future, the team can more easily troubleshoot by comparing to the benchmarked data. The tools make data collection and reporting easy, enabling contractors to set up a replicable commissioning process, and better prepare for service needs or potential issues that may arise in future service visits.

A Smart Pivot
Simpson Salute Heating and Air had been growing steadily over the years when suddenly in 2021, its trajectory changed. During a period of rapid growth in terms of the number of installations completed, the company started noticing a drop in installation quality and an increase in customer call backs. Profits decreased by four percent, and there was a clear negative impact to staff morale and customer satisfaction.

“Then in 2022, we were introduced to measureQuick, a popular smart diagnostic platform, which turned everything around,” said Simpson Salute owner, Chad Simpson.

Organization Quick Facts

Simpson Salute Heating and Air
Founded on more than 100 years of combined experience, Simpson Salute is committed to setting new standards for reliable, superior service in northeast Ohio. Simpson Salute installs and services systems of all types, including gas furnaces, heat pumps, boilers, and more. The company’s 5,000 square foot training center ensures its technicians and other local industry members are on the cutting edge of HVAC technology.

Chad Simpson, owner
Location: New Philadelphia, Ohio
Founded: 1999
Website: simpsonheating.com
Not only did the tool help technicians diagnose and correct more of the potential issues that lead to calls back, but it also increased the efficiency and ease of each call while facilitating communication and understanding between the technician and the customer.

“Using this platform and regularly adding more smart tools to our arsenal, we saw measurable improvements across the board,” Simpson said. “Our call back rate dropped back down from three percent to one percent, in large part because we started using all smart diagnostic probes for every call to find and correct as many potential issues as possible.”

### The Bottom Line

Within one year, the business also saw a significant increase in customer engagement through online ratings and reviews. The number of Google reviews for Simpson Salute increased from 150 to 570 (while maintaining a rating of nearly five stars out of five), and their Facebook followers increased from 328 to 1,518. Another brand under the Simpson Salute umbrella, Bonsky Heating and Cooling, increased its Google reviews from just a few to 526, and its Facebook followers from 11 to 757.

“During periods of business growth, some element of the business typically suffers, such as profit, culture, or customer experience,” Simpson said. “Since introducing smart tools, we were able to improve in all these areas while also growing our businesses dramatically. Bonsky grew from a $700,000 business in 2020 to $6 million in 2023. Simpson Salute grew from a $3.8 million business in 2020 to $10 million business in 2023—and is on track to reach $17 million and 16 percent net profit in 2024.”

### Paying it Forward

Having seen firsthand the impact that technician knowledge of smart tools can have on a company’s bottom line, Simpson Salute has made them a key element of its HVAC technician training program, which the company offers in its 5,000 square foot training center containing a dozen HVAC systems.

“In addition to hands-on learning, we also emphasize the importance of developing technicians’ soft skills,” Simpson explained. “We even go as far as to role play the entire call, starting with knocking on the door. Until recently, however, there wasn’t an easy way to teach technicians how to explain system performance issues and opportunities to customers. Smart tools facilitate the discussion and help customers make informed decisions.”

With this approach, Simpson Salute has earned a reputation for producing knowledgeable and capable technicians, preparing them for quality work in as little as 30 days. They are often approached by other contractors who are interested in training for their own technicians. “We hosted more than 50 companies over the past year,” Simpson said. “We can now announce a new class and have it filled within a day.”

When it comes to competition, Simpson Salute takes a “rising-tide-lifts-all-boats” approach. “Helping increase trust between contractors and customers benefits our industry as a whole,” Simpson said. “Besides, now that we’re seeing the benefits of embracing new diagnostic technology, we’re planning to stay ahead of the curve.”

### References


## About the STEP Campaign

The U.S. Department of Energy (DOE) Smart Tools for Efficient HVAC Performance (STEP) Campaign supports the use of smart diagnostic tools to streamline commissioning, diagnostics, and ensure optimal HVAC system performance. Please reach out if you are interested in joining the STEP campaign as a partner, receiving technical assistance, or being recognized for your company’s adoption of, or training on, smart tools.

**Contact us:** techchallenge@pnnl.gov

**Learn more:** [www.energy.gov/eere/buildings/smart-tools-efficient-hvac-performance-campaign](http://www.energy.gov/eere/buildings/smart-tools-efficient-hvac-performance-campaign)