



**Mumbai**  
Population  
**13.8 million**

# Mastering The Volumes

From its centralized laboratory in suburban Mumbai, India, Thyrocare Technologies processes 100,000 diagnostic tests each night – more than in any other comparable lab worldwide. Made possible by one man's vision coupled with state-of-the-art automation solutions.

Text: Archis Mohan   Photos: Atul Loke



At midnight, a laboratory the size of a football field situated in the basement of a nondescript three-storied building in a suburb of Mumbai sees frenetic activity. Men and women in white lab coats place bundles of bar-coded vials on two serpentine tracks linked to a series of diagnostic machines.

During the day, nearly 25,000 vials with blood and urine samples are flown in from every corner of India. Each sample undergoes an average of four tests on a lab automation solution by Siemens that consists of two tracks of 17 meters and 12 meters in length, with 14 immunoassay analyzers linked to each track.

By the time dawn breaks over the Mumbai coastline, the automation solutions at Thyrocare Technologies have processed nearly 100,000 tests and posted the reports online, almost all without any human intervention.

The man behind Thyrocare is Dr. A Velumani. His entrepreneurial vision, supported by state-of-the-art automation solutions, has made Thyrocare the leader in the Indian diagnostic industry. "Thyrocare is the world's largest single-floor, centralized, fully-automated, IT enabled laboratory," says the 54-year-old CEO and

founder. Thyrocare was also the first in India to use barcodes and bidirectional interfacing in diagnostics to eliminate errors.

## King of Volumes

In 1995, Thyrocare started as a thyroid function testing laboratory. Today it is the youngest of the four key players in the Indian diagnostic industry. Yet, it commands 60 percent market share.

Thyroid function testing continues to generate 70 percent of Thyrocare's business. The thyroid is a vital butterfly-shaped gland below the Adam's apple that releases a hormone that helps the body use energy, stay warm, and keep all organs working normally. It is estimated that 42 million Indians have thyroid disorders.<sup>1</sup>

There are four pillars to Velumani's business model – large volumes, low costs, speed, and accuracy. "We are a single laboratory for a billion people. We are faster than any local laboratory that serves its local population. We are the fastest on earth," boasts Velumani.

He has modeled his business on the newspaper industry. Every morning, Thyrocare's franchisees collect blood samples from 20,000 collection points

in hospitals, nursing homes, and laboratories across the country. Each patient sample is collected in Thyrocare pre-barcoded empty vials. The barcode identifies each patient specifically during collection, ruling out the majority of pre-analytical errors. After entering the data related to the barcodes in the webserver, the Thyrocare franchisee aggregates all the vials, and packs them in a temperature-controlled transportation system for air-cargo delivery to Mumbai. So while the patient data typically reaches Thyrocare in couple of minutes, the consignment of vials takes a couple of hours by airplane.

Most consignments reach the city by ten in the evening and are collected by Thyrocare employees, who deliver them to the centralized laboratory within a couple of hours. All samples are in the laboratory by two in the morning. These samples are subsequently loaded onto the two lab tracks with the immunoassay instruments that read the barcodes, conduct the tests, and post the reports online by six in the morning.

Laboratory workers across the length and breadth of India punch in a password on the laboratory's website to download and dispatch the reports to customers. Thyrocare boasts a turnaround time of less than 20 hours from the time the sample was collected.

The immunoassay analyzers offer more than 275 assays for screening, diagnosis, prognosis, and monitoring of most diseases.

"Siemens rules my floor and I am proud of it," says Velumani of the decade long association. Siemens has accompanied Velumani at every step and turn of Thyrocare's meteoric rise.

## From Rags to Riches

Velumani hails from a very poor family from Appanaickenpatti Pudur, a small village 28 kilometers from Coimbatore in Tamil Nadu. At the age of 16, Velumani enrolled at a college in Coimbatore to study chemistry. He even worked as a domestic servant in a rich man's house to ensure that his graduation dream would come true.

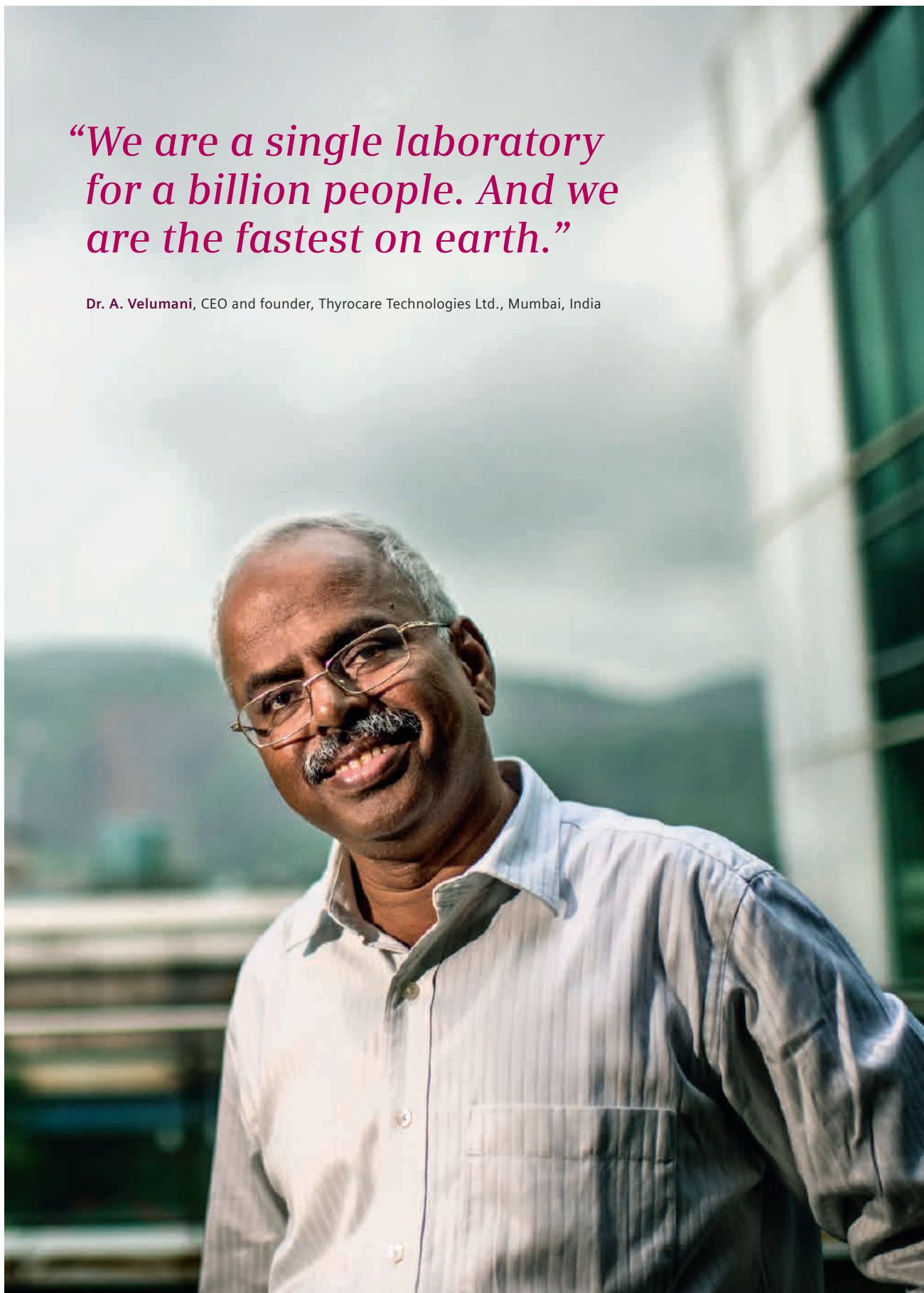
At 23, Velumani arrived in Mumbai and was lucky enough to find a government job as a lab researcher at the Bhabha ▶



Thyrocare's headquarter houses a laboratory the size of a football field in the basement.

*“We are a single laboratory  
for a billion people. And we  
are the fastest on earth.”*

Dr. A. Velumani, CEO and founder, Thyrocare Technologies Ltd., Mumbai, India





Once the sample cooling boxes arrive at Thyrocare from Mumbai airport, the lab staff assembles the vials in specific tube trays.





Few staff resources are required to monitor the automated testing process. All procedures can be reviewed in a centralized IT system.



# Thyrocare: Key Facts

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Thyrocare is the ***biggest*** centralized single-floor laboratory in the world

It has **20,000** collection points across India

It collects **25,000** blood samples  
from 1,000 towns daily

It performs **100,000** tests every night

It maintains **90 days'** stock of reagents

It has **650** business partners and **500** employees

Its turnaround time is less than **20 hours**, including transport time

Annual turnover (2012-13): INR **1,800** million (US\$ 27 million)

Total business value:

INR **20,000** million (US\$ 300 million)

Network vast enough to process **500,000** tests a day

Its ***manpower cost*** is **7%** of turnover – the lowest in the industry

Atomic Research Center (BARC). It was the first of many lucky turns that eventually led Velumani to become an entrepreneur. At the age of 37, Velumani found his job becoming more routine and monotonous. He quit his cozy government job and started the "romance with risk" stage of his entrepreneurial journey.

In 1995, he set up his first laboratory in a small garage – while studying for his Master's degree followed by a doctorate in order to hone his skills.

Velumani rented 150 square feet of space in a garage, hired an underutilized testing machine, and started offering thyroid-function testing for one-fourth of the existing market price, on the assumption that as volumes increased the reagent costs would decrease. He offered nearly 60 percent profit to his franchisees while his competition offered only 15 percent.

By the turn of the century, Thyrocare was testing 4,000 samples a day. The boom in the aviation industry helped Thyrocare transport samples from across India at low cost, while the growth in the IT and telecoms industry enabled uploading of test reports which could be downloaded the next morning even in the most remote corners of India.

## Advantage Automation

With time, the number of vials Thyrocare received every day continued to increase – as did the number of systems on the lab floor. By 2011, the test volume was so high that Thyrocare installed an automated lab solution with scalable tracks to connect its analyzers together into a single consolidated workstation.

Automation significantly decreased costs. It reduced the turnaround time by three hours, made the workforce more productive while reducing the overall need for manpower as well as the quantity of consumables such as number of vials and quantity of reagents. At present, Thyrocare has 650 associates across India who collect and send samples to Mumbai.

Velumani pegged the cost of thyroid testing to the lowest in the market. Volumes went up and the cost of reagents came down since he bought in bulk. He brought the cost of the thyroid func-

tion test down by 75 percent and claims he has not increased the price once in 18 years.

"My reagent costs are low because Siemens gives me the best possible rate," he says.

Velumani's vision is to provide the entire gamut of diagnostic tests at an affordable cost. He wants to provide body profiling of 125 tests for as little as US\$ 50. "Health insurance in India is in its infancy and people pay from their pockets. That's why affordable preventive healthcare is crucial," says Velumani.

Thyrocare estimates that increased volumes would require it to scale up its current level of automation. According to M. Chandrasekhar, General Manager (Infrastructure), in 2014 Thyrocare will become the first laboratory in the world to install a truly unified high-end Siemens automation system which will have two customized tracks of 75 meters each, with each track having 32 immunoassay analyzers attached to it. It could potentially do one million tests a day.

Velumani says his dream is to have 12 single-floor, fully-automated laboratories across the globe, each servicing areas within a three-hour flying time. In addition to Mumbai, these hubs could be in Bahrain, Johannes-



## See India's Largest Lab in Action

How does Thyrocare handle this impressive sample throughput? What challenges faced the enterprise? CEO Dr. A Velumani shares more insights into his business model in our documentary film.

[www.siemens.com/thyrocare-india](http://www.siemens.com/thyrocare-india)



To watch the video, scan the QR codes using the reader app on your smartphone or paste the URL into your browser.

burg, Nigeria, Brazil, New York, Los Angeles, Paris, Moscow, Jakarta, Hong Kong, and Shanghai.

Asked if that weren't a rather ambitious dream, he replies, "I don't dream. I never dreamt I would be an entrepreneur one day. In fact, the only thing that hasn't changed in my life in the last 35 years is my wife, Sumathi."

And what about competition? Velumani says it is impossible to replicate his model. "There are many entry-level barriers, for example the cost of air-cargo," he says. "Without volumes, this rate is not possible. And without this rate, this volume is not possible. Checkmate." ■

➔ [www.siemens.com/laboratory-automation](http://www.siemens.com/laboratory-automation)

<sup>1</sup> Unnikrishnan AG, Menon UV. Thyroid disorders in India: An epidemiological perspective. *Indian J Endocr Metab* [serial online] 2011 [cited 2013 Oct 22];15:78-81. Available from: <http://www.ijem.in/text.asp?2011/15/6/78/83329>

The outcomes achieved by the Siemens customers described herein were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that others will achieve the same results.

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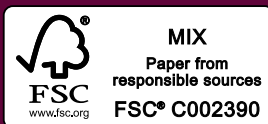
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