



Redesigning the Financial Landscape

With unwavering focus on low operating cost and high efficiency, Vortex Engineering has developed a reliable and secure range of ATMs that have changed the face of banking in India. Efforts such as these assume more significance in the wake of the recent demonetisation drive by the government and help in India's journey towards a cashless economy. Sathyan Gopalan, CEO of Vortex, talks about how their indigenously designed ATMs are aiding financial inclusion in the country.

The journey of Vortex started at a time when penetration of banks was quite low in the country—in many rural areas, people had to travel for nearly two hours to access banking services. ATMs too were hard to come by, unlike in urban areas. In 2004, IIT Madras conducted a study on how information and technology could be leveraged to help banks reach out to a larger population, especially those who do not fall within the ambit of conventional banking. They approached us for execution of the idea. And we, at Vortex Engineering, were drawn into the project.

At that point in time, there were rural internet kiosks offering a range of services such as email, video chat, etc., on payment of ₹5 or ₹10. We experimented by delivering value-added banking services—insurance products and small loan offerings—getting delivered through the kiosk operators. But soon we identified a problem—they were not equipped to conduct due diligence on the credentials of the recipients of the services. And for a bank to send its staff for this would be an expensive proposition. This set us thinking on how to find an economically viable solution. Installing an ATM seemed a bright idea indeed, but we were ap-



prehensive whether people in rural areas, who were not even familiar with the concept of banks, would trust a machine. However, as IIT Madras too wanted it, we started work on developing ATMs for rural India, meeting a number of performance criteria conventional ATMs do not.



The challenges were many—creating a secure, viable and reliable mechanism, developing a low-cost model, and low availability of ATM-fit currency. As a pilot project, we installed ATMs that run on solar power, in a few villages. Resistance to change and fear of technology stood in our way. Also, the concept of a four-digit PIN number made people feel too vulnerable, especially women who hide their earnings from men, out of fear of them splurging it on liquor. Even banks felt that most ATM frauds were owing to careless use of the PIN. The project team too felt it was not feasible to install ATMs in rural areas because most of the time, the machines were not working properly.

Another problem was that in rural areas, the quality of currency notes tended to be poor since many do not keep them in wallets. Owing to the shortage of ATM-fit currency, banks faced the problem of paper jams and notes getting stuck while loading. ATMs used to go out of service often, and it used to take long for service engineers to repair them.

The most critical problem was the long hours of power outage, sometimes stretching to 2-3 days. To ensure security, ATM machines are enclosed in thick steel containers. These could get extremely hot and lead to a breakdown. Installing ACs was the way out, but this would add to the problem of high power consumption by the ATMs.

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SOLUTIONS

We soon started working on the findings of the pilot. Biometric authentication was offered as an option to using the PIN number. Customers could choose how they wanted to be authenticated, and the banks could have some customers PIN-based and others biometric-based.

To ensure better quality of currency, we overhauled the way cash was dispensed. Since the currency counting mechanism (of the ATMs) was modelled on how people count notes (using two or three fingers, it did not consume more than 2 watts, notionally), there could not be any plausible reason why an ATM dispenser should consume 800 or 1,000 watts. We came up with a simple, reliable, and futuristic design that helped us handle a wider spectrum of currency quality compared to conventional ATMs, consuming only 5% energy. This helped us solve the problem of the ATMs generating too much heat. Even in the hottest of places, temperatures would only touch nearly 50 degrees Celsius and electronic equipment would work well in temperatures up to 70 degrees. This ruled out the use of ACs, and added to the savings on power. As a result, the power consumed by our ATMs was a single-digit percentage of what was then the conventional norm.

Batteries were recharged whenever power was available, to sustain the ATMs for longer periods of time. A four-hour back-up was built into the ATMs as default, and in areas which faced a major power crisis, a small solar panel was installed for all the ATMs.

PILOT PROJECT

We made pilot installations in 2008 with State Bank of India (SBI) in Cuddalore district of Tamil Nadu, under a UNDP-sponsored project for MGNREGA (Mahatma Gandhi National Rural Employee Guarantee Act) beneficiaries. The conventional method being followed for distributing pay, under this scheme, was: the panchayat head maintained a log of the work hours of employees, and the total amount payable was transferred to his account by the district headquarters. He would then withdraw the money and distribute it among the workers whose signatures or thumb impressions were taken to complete the transaction. This was a risky affair, for two reasons—a huge amount of cash was being carried over long distances, and there was no assurance that the beneficiaries received what is due.

Our ATMs were deployed at five locations, and used by MGNREGA beneficiaries as well as others. However, this was a time-bound project, but it made SBI understand the potential of ATMs in rural areas. They called for a request for proposal (RFP) for around 1,000 'rural ATMs', a term technically invented by us.

Nearly 550 such ATMs were deployed in different areas, and initially, they were supposed to be at contiguous locations close to Chennai. But since these ATMs had novel features, the bank allotted them at branches across the country. Later, more private as well as public sector banks approached us, and the Vortex network stands at nearly 3,000 Vortex ATM installations across Asia and Africa (Nigeria, Sudan, Tanzania, and Madagascar).

INNOVATION-CENTRIC

For Vortex, innovation is about providing more for less, providing accessibility to customers otherwise not reachable, and reducing cost and time to procure and operate. Our focus has always been to take user experience to the next level, through economical and eco-friendly products.

Our ATMs are designed to run without air-conditioners and needs the lowest possible UPS/battery and solar panel infrastructure. Being the lowest power-consuming ATMs (60 Watts) in the world, they reduce operating costs by nearly one-third when compared to conventional ones. Also, all the Vortex ATMs offer regional language receipts, without switch intervention.

Funds have been flowing steadily, offering a boost to our innovative efforts. In 2010, we developed the Gramateller Duo for State Bank of India, across the country, and in 2013, came out with Eco-teller Mini, the first desktop ATM in the Indian market. It offers the advantages of conventional ATMs (automation of cash dispensation) and micro-ATMs (mobility), and mitigates the disadvantages of both. It is deployable in mobile cash vans or shared spaces such as post-offices, weighs less, and is low on power consumption (60W) since it is designed to run without air-conditioners. It uses the Linux open source application, which protects it against malware attacks; this is also in line with the government guidelines on e-governance solutions. Ecoteller Mini ATMs have been installed in five public sector banks in the country, among which 100 are installed for United Bank of India via the first-ever desktop RFP. It bridges the last-mile access gap—which has been an inhibitor for conventional ATMs—and aids in the government's financial inclusion programme.

THE ROAD AHEAD

At present, we have two manufacturing facilities—in Chennai and Puducherry—with an annual produc-



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tion capacity of over 12,000 ATMs. We also have the most comprehensive tools for predictive maintenance at our service centres in 35 different locations across the country, ensuring support 24/7.

Low operating cost and low power consumption have always been our USP, and the fact that we own nine patents points to the fact that we offer the best of technology at affordable prices to our customers. We are the only Indian company to have developed dispenser technology in association with IIT Madras.

We now plan to assist global retail banks adopt new processes and technology in their self-service channel. To this end, we are continuously expanding our product range of both hardware and software products. ■