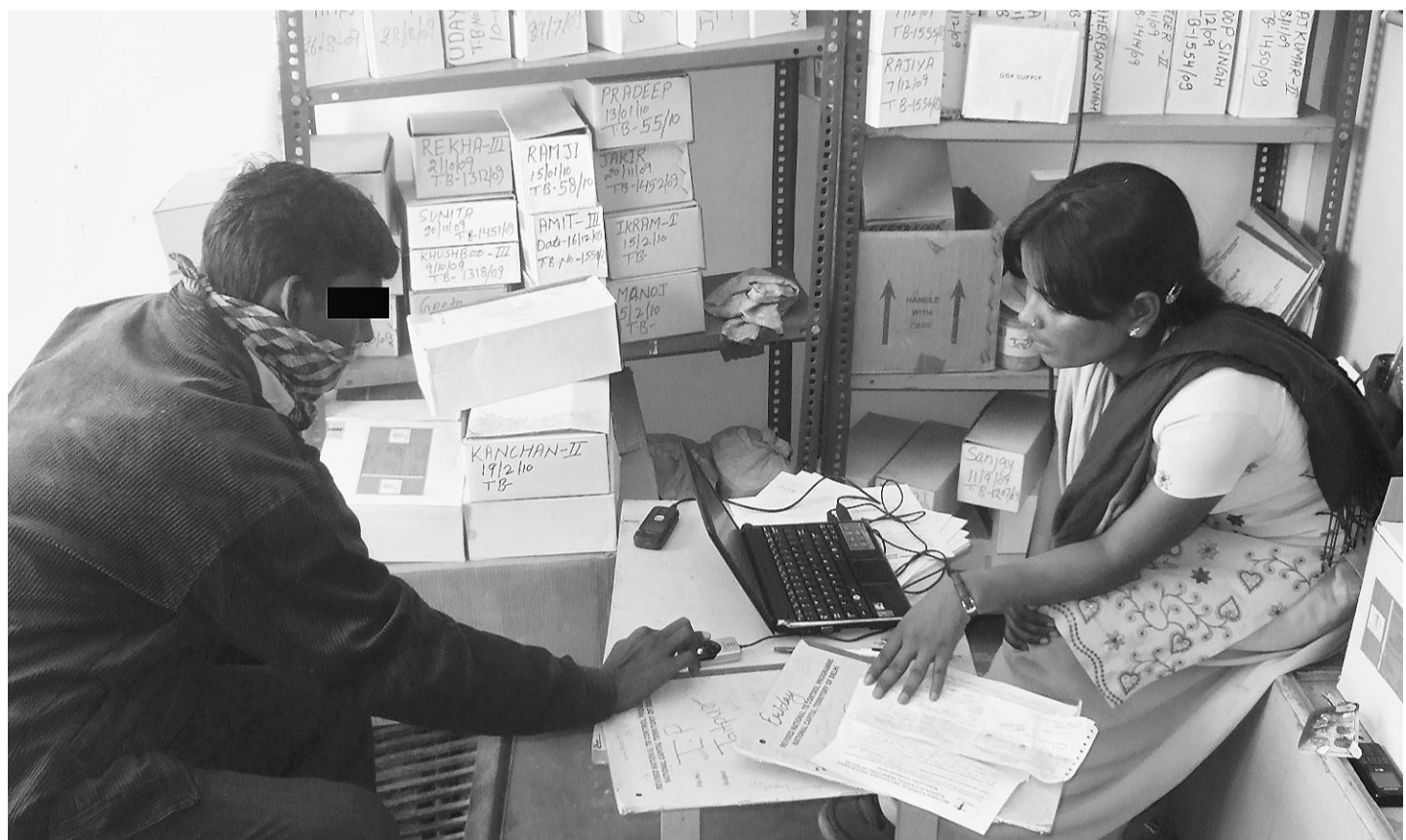Researchers at Microsoft's lab are given a free-hand and not everything is aimed at developing products

Research for research's sake

Software giant Microsoft has seven research "labs" around the world. One is in Bangalore. **Indulekha Aravind** visits to find out what it does and why Microsoft Research has deliberately delinked R (research) and D (development)

The biometric system developed at the lab is being used by an NGO to track delivery of medicines to 1,200 TB patients

A research facility from a long memo. That would be the story of Microsoft Research's genesis in one line. The memo in question was from Nick Myhrvold, considered at one time Microsoft founder Bill Gates's right-hand man, to the company's board of directors. It explained why such a facility would be critical in coming years, and asked for $10 million to get started. Microsoft Research, set up soon after in Redmond, went on to build a strong team of researchers and expanded to seven locations around the globe. One spot on that map was placed in India in 2005 when the research facility was set up in Bangalore. It was one of the venues, last month, of the celebrations across the world to mark 20 years of Microsoft Research.

"Lab", here, is used in the broadest sense: there is not the remotest similarity between the image of white-coated scientists darting about, that the word might conjure up, and MSR India's swanky office in the 154,000 sq ft building on Lavelle Road near downtown Bangalore. In fact, the central quadrangle of its office, with its traditional wooden pillars, would look at home in an interior design magazine. MSR India occupies the first floor of the glass-fronted building which it shares with the Microsoft India Development Centre. And a walk through the corridors will re-

veal that, apart from the usual cabins and cubicles the office is divided into, there is even a nap room with a bunk bed for tired researchers to catch forty winks! The lab now has 55 full-time staff, which includes 33 PhDs, in addition to which it attracts over a hundred interns at different times of the year, peaking in the months of June, July and August.

When talking to different people at the lab, the innovation that invariably pops up as an example of the success of Microsoft Research is Kinect. And with good reason. The controller-free, motion-sensing camera for the Xbox 360, incubated in the Cambridge lab, sold a record 8 million units within two months of its release.

While the Bangalore lab is yet to come up with a product that has generated that much buzz, its recent innovations include Wikibhasha, a tool that allows users to translate content from Wikipedia into other languages and then either create new articles or add to articles already in the multilingual Wikipedia. There are also a Bollywood song search which uses a Roman-to-Hindi transliteration engine to provide query completion while searching for a Bollywood song, and the DebugAdvisor, used in many Microsoft product groups worldwide, which makes debugging easier by helping a user find similar bugs, giving guidelines on how to

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> **P ANANDAN**
> **Managing Director, MSR India**

debug similar problems and even providing a list of experts who can help solve the problem. Rich Interactive Narratives, or RIN, is another innovation that has attracted attention — the project, which combines traditional forms of storytelling with digital narratives that let you stop a video when you want to explore different aspects in the video such as another room or a sculpture, or to shift the focus, and enables 3D walk-throughs. There is one through a temple.

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MRS India Managing Director P Anandan, who mooted the idea for an India lab in 2004, says he is quite satisfied with the progress, even without a blockbuster innovation. Production, emphasises the old Redmond hand, is not measured in terms of the number of innovations or the money spent. As evidence, he points out that someone from the Bangalore lab has made it to MIT's TR35 (Technology Review 35, an annual list of the top 35 innovators across the world under 35) every year for the past three years. "We've been able to meet the bar of the other Microsoft Research labs," he adds.

Aishwarya Ratan is one of those who made it to MIT's TR35 this year. Ratan was on the list for her digital slate which converts paper records to digital in real time, something she hit upon while working with Microsoft Research India, as a solution to help

local microfinance outfits maintain accurate records. An electronic ballpoint pen is used to write on a notebook kept on the slate, which converts the handwritten entries into a digital record in real time — the familiar notebook format makes the transition easy for users, while digitisation ensures accuracy of record and easy updating. Ratan has since moved on to Yale, but her erstwhile colleague at MSR India, Indira Medhi (herself part of TR35 the preceding year), says the slate is now being tried out in Madhya Pradesh by NGO Real Medicine Foundation to track the nutrition levels of 65,000 children suffering from malnutrition.

Medhi is part of the "technology for emerging markets" group at MSR India, as was Ratan. This is the most eclectic of the seven core research groups and unique to the India arm, with people from backgrounds as varied as cognitive neuroscience and communication research coming together with the idea of finding technological solutions for low-income sections of society.

"This is the only group of its kind I found where there is an overlap between technology and development," says 33-year-old Bill Thies, who came on board in 2008 after doing a PhD in computer science and engineering at MIT. Thies's ongoing projects at MSR India include a fingerprint-based biometric system for tracking attendance. It uses a netbook, a fingerprint reader and a low-cost mobile phone and is currently being used by an NGO to track the delivery of medicines to 1,200 TB patients.

There are six more core groups here: algorithms research, cryptography, security and applied mathematics, mobility networks and systems, multilingual systems, rigorous software engineering, and vision, graphics and visualisation.

Where Microsoft Research differs from other corporate labs, says Anandan, is that not everything is aimed at products, and researchers are given a free hand. "People don't believe such free-flowing models will work but that's how we function." Something else Anandan and his team had trouble convincing people in India about is the concept of re-

search for research's sake. "Delinking the R (research) from the D (development) was quite a task. So in the initial years we were evangelising why research is important," says the Microsoft veteran.

Research for research's sake could result in many innovations that might not fit into any of parent Microsoft's many products, but that in no way is a deterrent. Nor do researchers constantly think about how a product might find a place on the shelf.

That's where B Ashok and his advanced development group come in. Ashok, also an old Microsoft hand of over 20 years, and his team are the bridge between product groups and the researchers. "We are the interface for both sides and we help ensure some of the research becomes products," says Ashok, whose job profile includes "keeping his ear to the ground". The idea is not to create a solution after encountering a problem but to have something in the pipeline that could eventually be used, he says.

If all the research that goes on does not end up as a Microsoft product in some form or the other, and if Anandan is not always looking over the researchers' shoulders, how is the work at the lab evaluated? "Peer reviews," explains Saikat Guha, a researcher with the mobility, networks and systems group. "We have to prove the utility to broader research groups worldwide, and publishing papers is one way to do this." "By making our research public, we could end up with something much bigger than the sum of the parts," says Guha, who is working on a solution to ensure targeted delivery of online advertisements that will not breach users' privacy, for which he is collaborating with researchers in Redmond and Germany.

With several papers having been published by its researchers and the lab having proved it is "world-class", Microsoft Research India is now very much a part of the Microsoft Research arsenal, says Anandan. "The goal now," he says, "is to come up with things that will create a legacy." And he, for one, seems confident that that is only a matter of time.