



by Julie Middleton

Rock star of the number crunchers

For most of us, R is the 18th letter of the alphabet, or the label attached to adult movies.

But for many of the world's best-known and biggest companies, like Google, Pfizer, Shell, Facebook and Microsoft, R is a must-have software package that has radically changed the way they wrangle data. Universities like Cambridge, Oxford and Harvard use it too!

R was born in New Zealand thanks to Ross Ihaka, an Associate Professor of Statistics at the University of Auckland. What's more, R is completely free; people can pick it up and adapt it to suit their tasks. And they do, in their hundreds of thousands, all over the world. The prestigious *New York Times* recently raved about R in a widely circulated online article.

Ross, 55, of Pakeha and Ngati Kahungunu ki Wairarapa descent, says he never thought R would go global, "not in my wildest dreams – I didn't really expect it would ever be used outside of the University of Auckland".

R is used anywhere people need to organise data, run calculations and create graphical representations – and in universities, industry, business and government, there's a vast amount of data being generated. Every day, for example, our supermarket purchases, internet searches and Facebook behaviour is collected and that vast amount of information needs to be sorted into something meaningful.

Enter R. Its success lies in its user-friendly simplicity coupled with power and versatility: people without major programming training find it easy to customise, and it has become a serious threat to commercial competitors. The programme is now available through 75 internet sites in 30 countries and it has spawned more than 40 books.



Ross Ihaka - stats genius and Friend of Oakley Creek.

But its beginnings were pretty humble – in a University of Auckland corridor, in fact. Back in the early nineties, Ross got talking to then-colleague Robert Gentleman, a Canadian, about the lack of user-friendly technology for their first-year students to analyse data and do graphs.

Ross had already developed a few ideas, and the pair, although not expert programmers, decided to start building “a basic structure that people could start plugging things into”.

It was all a bit DIY, says Ross, blended with a fair amount of Kiwi ingenuity: “We basically didn’t know where we were going at the start.”

Ross and Robert called their baby R for the initials of their first names, and because single letters can’t be trademarked. They decided to develop their new language, which was released in 1996, under a public licence. This means that the software is free – anyone can develop it as long as they share it and the underpinning source code, a concept known as ‘free software’.

“It’s to encourage community participation,” says Ross, a staunchly independent thinker (he calls himself an anarchist) who resisted pressure to commercialise R. “Essentially, the licence says ‘I will share my stuff with you, provided you share with me.’ If people’s rights weren’t protected, there would be no incentive for them to contribute.” Developers, he says, are driven by altruism and the chance to show off their skills.

Ross describes R’s success as an example of “the rusting-hulk model of software development,” a phrase coined by a visiting colleague who remarked on its can-do beginnings.

“If you went to a junkyard and hauled out an old junker and put it by the road and stood there looking helpless, people, being do-it-yourself types, would step and help you out and after a couple of hours you’d have a pretty good car,” Ross says.

“So we cobbled this thing together and hung it out by the side of the internet, and after

a few years we had a pretty good piece of software. But it’s the contribution of lots of people.”

Indeed. Some IT companies have estimated that more than one million people use R. Whatever the tally, enthusiasts have developed more than 2,500 add-ons to R, including one that analyses speech patterns and another that is used to study the human genome.

The non-profit R Foundation is funded by entities such as bank, pharmaceutical, research and biotech companies, a hotel chain and even our own Telecom. R is a teaching tool at hundreds of universities, including Stanford, Berkeley, Harvard, Oxford and Cambridge. In the developing world, R is often the only software people can afford.

Ross, a separated dad of daughters Clara, 19, a florist, and student Emma, 16, lives in Avondale, Auckland. He and older siblings John, who now lives in Featherston, and Jill, now in Queensland, grew up wherever their late parents, Jack and Edna, worked as teachers: Paeroa, Alfriston, Rarotonga in the Cook Islands (“we all went feral there”), and Whangarei.

His paternal great-grandfather Piripi Ihaka, who was born in Papawai, Wairarapa, married

Surrey-born Mildred Baker; they lived at Taueru, near Masterton. “My impression is that Piripi felt that the way forward for the family was to integrate with Pakeha, to the extent that he would not let my father speak te reo,” says Ross.

“My father described going to get the old man’s blessing when he went away to high school: ‘You learn everything those Pakeha have got to teach you, or I’ll kick your arse!’ It’s something I like to pass on to others.”

Ross says that from Piripi’s standpoint it was a good move. “My father was one of the first from his area to go to high school; I have a PhD. These are big steps in two generations.”

But there is a personal cost: “I haven’t been terribly connected with my Maori roots; on the other hand, I have never been particularly connected with Pakeha roots either, so maybe it’s just me. However, my father made sure we knew who we were and where we were from.”

Ross, who had a prized rock collection as a kid, initially wanted to be a geologist: he got a first-class honours degree and a masters, both in maths and both from Auckland, then a doctorate from the University of California, Berkeley.



Back in the department. Ross and student at work at Auckland University.

Ross has also been involved with Maori research, in particular Te Hau Mihi Ata, a recent Foundation for Science and Technology project led by Waikato University's Linda Tuhiwai Smith. It explores ways to link matauranga Maori and western science.

"The people who held traditional knowledge were brought together with scientists to try and break down the barriers, to see whether we could encourage discussion that might lead to cross-fertilisation."

Ross describes himself as a Westie who gets a lot of pleasure pottering among his new citrus trees. He's a keen supporter of Oakley Creek, a west Auckland roadside gully that has been transformed into an urban gem, which he weeds and plants with his fellow Friends of Oakley Creek.

He supported local groups resisting plans for State Highway 20 to run overland in west


Auckland, appearing in the Environment Court to present the statistical evidence that air pollution would damage residents' health (most of the highway is now going underground).

In 2008, Ross won the country's top award for technology, the Royal Society's Pickering Medal. On 5 August, this quietly wry academic will be in Vancouver to accept, jointly with Robert, who now works in the US, a \$9000 award for innovation from the American Statistical Association (ASA).

But Ross isn't comfortable being a poster boy; he finds the accolades "kind of embarrassing" and always points out how much others have helped. (When the ASA asked if Ross would accept nomination for the award, he suggested it should go to someone younger who needed a career boost.)

But there have been unanticipated personal

spin-offs: the experience has tempered Ross' well-honed cynicism (he reckons he's pretty grumpy).

"R changed my opinion of humanity to some extent, to see how people are really willing to freely give of themselves and produce something larger than themselves without any thought of personal glory. There's a lot of work with no recognition." 

Ross Ihaka's secret to success

"Follow your passion, whether that's writing obscure statistical software or cooking, or pig-hunting. Find what it is that really motivates you and do that, because you will be much happier and more fulfilled."



Darrin Sykes Chief Executive

SIX MONTHS ON

I have been in the job for coming close to six months shortly and I am beginning to appreciate the level of scrutiny that is applied from both the government and

claimants towards the Trust's funding policies.

It is worth reminding the sector that the Crown Forestry Rental Trust was set up because Sir Graham et al took the government to task over its planned sale of the state forestry estate in the mid/late 80's.

The Trust is an independent funding organisation governed by its Trust Deed. It does not hold Maori funds, nor does it source its funding from the public purse.

The Trust is the by far the largest Treaty sector claimant funder outstripping contributions from both The Office of Treaty Settlements and the Waitangi Tribunal combined.

The Trust is expecting to spend \$27.5m on claimants involved in direct negotiations with the Crown over the next year. This is in contrast with the Office of Treaty Settlements allocation of \$10m for claimant funding to support the settlement of historical Treaty claims.

Furthermore the Trust is allocating \$7.5m to claimants groups involved in the Waitangi Tribunal process. The total government appropriation (for the 2010-2011 financial

year) to the Waitangi Tribunal is \$9.9m, but this is related to the purchase of research and administrative services related to the management of claims through the Waitangi Tribunal, as opposed to the direct funding of claimant groups in a Waitangi Tribunal process.

The Trust funds available for settlement of outstanding claims will reduce at an increasing rate over the next few years, as highlighted in our 2010/11 Business Plan. It is worth noting that the cost of a settlement generally remains the same regardless of the size of the claimant group, the nature of the Treaty breach against them or the assets and likely settlement package.

We may be approaching a time where serious consideration needs to be given to ways of making the process more cost effective. One alternative is that at some point in the future it may become necessary for the Trust to place ceilings on the levels of funding available for particular activities.

The Trust regularly undertakes funding forecasts to anticipate the future resources required to support claimant groups and this is evident with the forecast / financial statements for the five years ending 31 March 2014 contained in the 2011-2011 CFRT Business Plan. This work has been extremely useful and gives confidence that with prudent management by the Trust, and efficient management within claimant groups CFRT will have the income to provide reasonable support to groups seeking to resolve their claims over Crown forest licensed land in the years ahead.

While this gives claimant groups assurance for the future, the Trust would like to see claims involving Crown forest licensed land settled much quicker so that the rental assets are released to the confirmed owners which will in turn enable them to realise their true economic potential sooner.

Ngā Kaitiaki Rēti Ngahere

CROWN FORESTRY RENTAL TRUST

