The Whittle Story
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Jeff Whittle's Speech at AO Dinner - Meccano to Mining

By Jeff Whittle, April 20, 2018

My name is on this award, but I didn't earn it on my own.

When we started in the 1980s, computer optimisation in pit design was a radical idea. I remember when Ruth and I had our first booth at the Society of Mining Engineering exhibition in the USA, I had a mining engineer tell me that "my granddaddy taught me how to design pits, and that's good enough for me"! That conservative attitude was what we were up against – and, to a certain extent, we still are, though daylight is slowly creeping in.

For a radical idea to succeed, you need three things. You need ideas, but you also need a lot of hard work and a lot of luck.

I will take credit for the optimisation program ideas, but a lot of ideas have also come from other people. For example. Gerald's concept of "Money Mining" was new to me, and Tech Services at Whittle Consulting have done a lot of things with the software that I had never envisaged.

When it comes to hard work, most of the people in this room have contributed over the last thirty odd years. In particular, I must mention Ruth. She took on the job of marketing my software right at the start and sold it world-wide before she retired in about 2000.

After ideas and hard work, we come to luck. A lot of things have happened over the years, and if any one of them hadn't happened, I don't believe that we would be here tonight.

In 1935, at the age of five, I was given a Meccano set, which changed my life. I built up the skill of taking a range of different components and putting them together to make something. Even back then I had no interest in making things that just looked good. They had to work. I built a lot of ever-more-elaborate cranes!

In 1953, having qualified as an experimental physicist, I went to work at Harwell, a large atomic energy research establishment in Berkshire, England. There I was billeted in a staff club containing seventy men and seven women, and I got lucky! Ruth and I married in 1954 and started our family. By 1961 we had four children, and another on the way. The World was in the middle of the Cold War, and the Russian president Nikita Khrushchev, had "promised" England thirteen hydrogen bombs. Through my work, I knew that there was likely to be a two-hundred-mile region downwind of any hydrogen bomb detonation where survival was difficult or impossible because of the fallout. Then there was a report of Russian troops massing on the Turkish border! There was a clearly a small but real possibility of a nuclear war, and England is not very big. It was quite easy to see where most of the hydrogen bombs would go, and almost everywhere would be downwind of one of them.

You think differently when you have small children and, one Monday night, we decided to get out of England. Since the atmospheres of the Northern and Southern hemispheres don't mix much, and since any nuclear war at that time was going to take place in the Northern hemisphere, we had to go to the Southern hemisphere. We settled on Melbourne because, although I had never met them, I had relatives here, and because our British passports, at that time, gave us the right to live in Australia.

Sixteen days later, Ruth and our four boys boarded the first of the nine 707 flights that it took in those days to get to Melbourne! I followed a month later having worked out my notice and packed up our house. We frankly didn't expect to like Australia. That was not the reason for coming, but we quickly grew to love it.

In 1962, I found that I had a calculation to do, as part of my physics work at the Defence Standards Laboratory in Melbourne, that was going to take me four months sitting at a mechanical calculator! To say the very least, I didn't fancy it! However, luck intervened, and the first bureau computer, a Ferranti Sirius, became available in Melbourne. So, I went and learned to program it, and over the next few years I did more and more computing and less and less physics.

In 1967, I moved to the new Monash University Computer Centre, and I stayed there for ten years. I had the good fortune to work on all aspects of computing with some very bright and creative people. I stayed there for ten years and I learned a huge amount, including techniques that I still use to this day.

In 1979, Newmont Australia, now Newcrest, advertised for a programmer to move 400 programs consisting of 250,000 lines of computer code from an old computer to a new one. This involved some significant structural changes to the code and would clearly have been very error-prone if done manually as they imagined. An additional problem was that they no longer had the test data for the programs. I persuaded them that, using skills that I had learned at Monash, I could write a translator which would do the code conversion in a way that guaranteed that the output would be unchanged.

It took me about three months to write the translator and another three months to translate all the code. By then, Newmont were used to me and I stayed on to work on a range of technical programs, including some optimisation programs.

In 1982, I came across a 1965 paper by Lerchs and Grossmann giving an algorithm for optimising the three-dimensional shape of an open pit - a very complicated problem. I also read that "mining would love to use the Lerchs-Grossmann method, but it's too hard to program"! Well that was a challenge wasn't it? I figured out how to program it on the very limited hardware then available and offered to write it for Newmont. However, they wouldn't take the financial risk, because it was "too hard to program".

In about 1983, with only one child still living at home, Ruth and I decided to develop the program as a private venture. Ruth said she would do the marketing, and that was the start of Whittle Programming.

Without the good luck of Meccano, Harwell, Khrushchev, the Ferranti Sirius, Monash, Newmont and Ruth's leap of faith, I don't believe we would have been here today. I am very grateful. Finally, this our award, not just mine. It legitimises computer optimisation in mining. Thank you, thank you, thank you.

Jeff Whittle AO, FAusIMM, FACS

Jeff Whittle's involvement with the mining industry began in 1979, by which time he had had 17 years of technical programming experience. He has since written a series of optimisation programs which are now widely used throughout the mining industry.

Since about 2000, he has concentrated on the simultaneous optimisation of mine scheduling, cut-off optimization, capital expenditure, mining rate and a range of other factors that influence mine value. This has resulted in the Prober series of optimisers, which are used by Whittle Consulting Pty Ltd. Prober has now been used in over 100 optimisation studies of single mines and mining complexes world-wide.

Jeff is an Officer of The Order of Australia (AO) – awarded in 2018 for services to international mining. He is also a Fellow of AusIMM and the Australian Computer Society.

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