



A Career in Commercial Mathematics

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Biarri

COMMERCIAL MATHEMATICS

- ✓ Set up Biarri in January 2009
- ✓ Involved with optimisation companies for 10 years primarily managing sales and marketing
- ✓ ‘Translator’ between mathematicians and business people
- ✓ Roles at Opcom, Carmen Systems and Boeing

Before commercial mathematics

- ✓ Management consultant in Australia, Asia, UK and US
- ✓ Transport manager with the United Nations
- ✓ Australian Army Officer
- ✓ Bachelor of Arts from UNSW (RMC Duntroon)
- ✓ MBA from UWA



The need for a quantitative capability

- ✓ Data is ubiquitous and cheap
- ✓ The analytical ability to utilise that data is scarce
- ✓ Biarri was established to provide analytics and optimisation to help business operate more efficiently
- ✓ We use operations research to solve complex business problems at an affordable price

Accessible Optimisation



Models for decision support: Insight, Collaboration, Analysis

Quantitative Models
Business analytics and custom models...

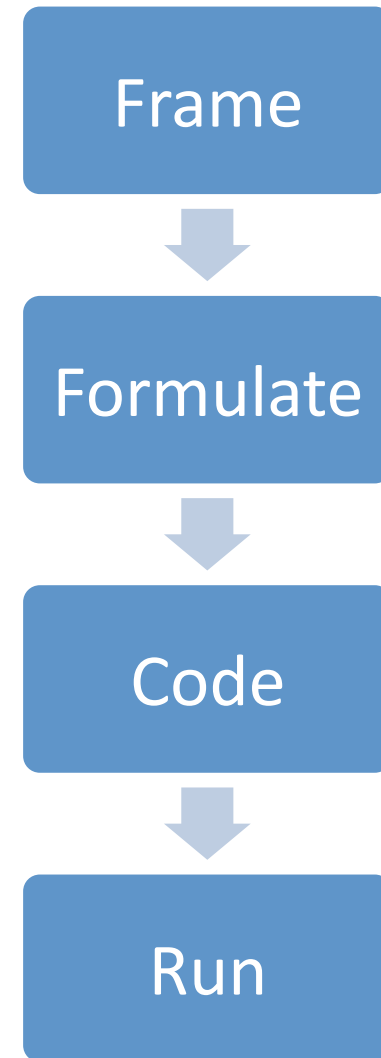
The graphic for Quantitative Models shows a stylized building with a grid of windows on the left. A red line graph starts from the building and trends upwards to the right. The background is filled with faint, light-blue binary code (0s and 1s).

Web Apps
Optimisation tools for planning and scheduling...

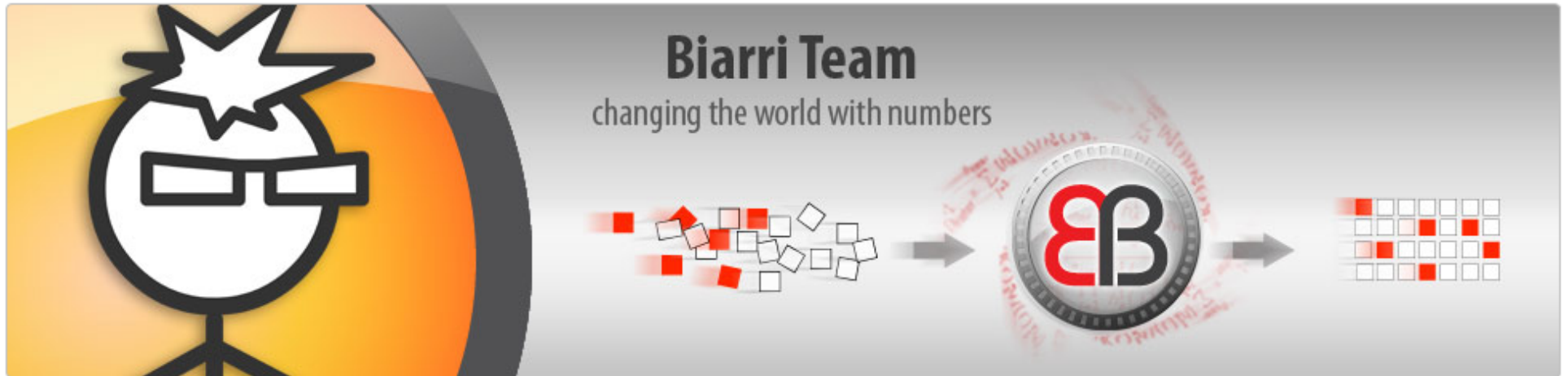
The graphic for Web Apps features a horizontal row of seven circular icons. From left to right, the icons represent: a server rack, a factory, a person at a computer, a network diagram, a truck, a person with a tool, and a globe. The background is light blue with faint, light-blue binary code.

What we Want

- ✓ Commercial Mathematicians
- ✓ Mathematical modelling, statistics, optimisation and simulation to arrive at optimal or near optimal solutions to complex problems
- ✓ Achieve improvement goals using **scientific methods**



Who we Have



- ✓ Aim was to make optimisation available to more businesses
- ✓ Put in place a team of experts: mathematicians, computer scientists, designers, industry and commercial specialists, developers and analysts
- ✓ See some examples . . .



Ben Hollis

Optimisation Guru

- ✓ Modelling, Design and Development
- ✓ PhD

Ben is an optimisation guru.

Education

- ✓ Ph.D. (Operations Research) Candidate, University of Queensland, Australia
- ✓ B.Sc. Hon. (Physics) 1st class, University of Queensland, Australia, 1999
- ✓ B.Sc. (Physics) University of Queensland, Australia, 1999

Areas Of Expertise

- ✓ Senior Consultant / Lead Software Engineer
- ✓ Pure and applied Operations Research. Specific techniques include:
 - ✓ Vehicle and Crew Scheduling
 - ✓ Train Scheduling
 - ✓ Vehicle Routing
 - ✓ Linear and Integer Programming
 - ✓ Delayed Column Generation
 - ✓ Column Generation acceleration techniques
 - ✓ Techniques for solving large Integer Programming formulations
 - ✓ Dynamic Programming
 - ✓ Meta-Heuristics



Loki Davison

Loki Davison

Computer Scientist

- ✓ Design and Development
- ✓ Bachelor of Computer Science (Honours)

Education

- ✓ Monash University | Bachelor Of Computer Science (Honours)
Thesis: Synthesis Of Electronic and Ethnic Drums
- ✓ University of Ulm | Diplom Informatik (Exchange)
Awarded Baden-Württemberg Scholarship by the German Ministry of Science and Research
Language of tuition: German.
- ✓ Monash University | Bachelor Of Computer Science
Awarded Merit and Equity Scholarship
Studied natural languages for all free electives

Relevant Professional Experience

- ✓ 2008 | Senior Computer Scientist - TaguchiMail
- ✓ 2006 | Computer Scientist - IntrepidTravel
- ✓ 2005 | Computer Scientist - HostExchange
- ✓ 2003 | System Administrator/Programmer - Advancen
- ✓ 2002 | System Consultant - Christian Blind Mission International
- ✓ 2001 | System Administrator/Programmer - Northeast Telecommunications Co-operative



Chris Forbes

Senior Optimisation Consultant

- ✓ Modelling and Planning
- ✓ Bachelor of Science (Mathematics)

Profile

Education

- ✓ B.Sc. (Mathematics), University of Queensland, 2010
- ✓ B.Sc. Hons (Mathematics), University of Queensland, 2011 (current)

Professional Background

- ✓ Software Engineer
- ✓ Pure and applied Operations Research
- ✓ Data Visualisation
- ✓ Data Analysis

Relevant Professional Experience

- ✓ Schweppes: Nightly vehicle routing and scheduling for East Coast Australia deliveries.
- ✓ NBN: Extension of formulation and optimisation of the layout of cable and location of hubs
- ✓ Ausenco: Optimisation of the earthworks and tracklaying schedule for the railway between Alpha Coal Mine and Abbot Point



Steven Donaldson

Steven Donaldson

Senior Optimisation Consultant

- ✓ Modelling and Planning

Education

- ✓ Bachelor of Mathematics, Queensland University of Technology (2010)
- ✓ Bachelor of Information Technology, Queensland University of Technology (2010)

Professional Background

- ✓ Software Engineer
- ✓ Applied Operations Research
- ✓ Data Visualisation
- ✓ Advanced Excel Modelling and Visualisation
- ✓ Data Analysis

Relevant Professional Experience

- ✓ Origin Energy: Optimisation of logistics network for Coal Seam Gas project in Queensland. The analysis included, warehouse/laydown sizing and positioning, vehicle routing, and materials/parts distribution.
- ✓ Schweppes: Nightly vehicle routing and scheduling for East Coast Australia deliveries.
- ✓ Queensland Rail: Optimisation of yield and maintenance.
- ✓ Transmax: Optimisation of on-ramp / traffic-light metering, capable of minimising the congestion on motorways.
- ✓ Queensland Cotton: Seasonal scheduling of transports to export locations over a transport network.

Advice

- ✓ Tools of the trade
- ✓ Work on your T
- ✓ Passionate about the power of mathematics

Questions



WE WANT YOU!

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