CHAIRMAN'S ADDRESS

This volume contains the proceedings of the 33rd International Symposium on the Application of Computers and Operations Research in The Mineral Industry (APCOM), held for the first time in Latin America, in Santiago de Chile.

During APCOM 2003 held in Cape Town in the honor of Professor Daniel G. Krige the International Council named the Mining Engineering Department of the University of Chile a host of the 2007 Symposium, a distinction for which I am deeply grateful.

APCOM, an international forum that has existed for 46 years, has exposed a wide range of traditional mining subjects such as Geological Exploration, Geostatistics, Mine Planning, Production Scheduling, Rock Mechanics, Process Optimization and Control, Maintenance, Emerging Technologies, and the like. Pioneering works on Geostatistics were published by such distinguished authors as D. G. Krige, G. Matheron, A. G. Journel, M. David, J. M. Rendu and many others. The same is true for the other disciplines. Today many of these subjects have specialized conferences of their own, such as Geostats, Mapla, Paste, Mineclosure, Hydrocopper, Minin and Massmin. In my view, APCOM is returning to its origins and although the traditional subjects are still interesting and valid, computer technology contributions have increased rapidly and subjects such as Information Technology, Corporate Information Systems, Knowledge Management, Global Optimization and Systems Integration have found a home in APCOM.

Applications have increased in quantum leaps since the old days when only large corporations could afford main frame computers. Personal computers and notebooks were not available, time sharing was common practice and there was a lack of commercial software. Perhaps, I can illustrate this with a short trip down the memory lane.

In the late 60's using a computer was quite an experience: usually you had to know a language like Algol or Fortran to write your own programs, also you had to know a computer dependent dreaded thing called "Job Control Language" (JCL). Something as simple as opening a file required you to write a few lines of incomprehensible gibberish, let alone a direct access file or extracting some data set stored in a large storage facility along with data from many other clients. When you had everything ready for input in punched cards you were given an appointment at 2:13 am to submit your "job". The computer was housed in a large heavily air-conditioned room where you were attended by operators dressed in white who looked like they had just got off a space ship. Very humbly you handed your 8,236 cards (4 boxes) and hoped that the operator would submit them in the correct order without shuffling them. You came back three days later at 4:28 am when you were given a very thin print out with many lines of stars and hieroglyphics, that looked very much like insults, and finally a line that read: "JCL ERROR, JOB ABORTED"…. "Well, next Friday at 5:26 am might be a beginning of a better day".

In the early 70's Dr. T. B. Johnson supervised my MSc thesis at The Colorado School of Mines. The subject was an application of Linear Programming to production planning

for block caving mines. The problem formulation for a small production level of the Climax Molybdenum Mine contained approximately 600 variables and constraints. No integer variables were allowed and each of the 5,000 or so matrix entries had to be fed to the computer through punched cards. The optimum solution in the US Bureau of Mines Burroughs B-5500 computer was reached in almost 6 hours. Today, problems that include several mines and treatment plants with millions of rows and columns and thousands of integer variables can be fed into the computer through matrix generators, and solved in a few hours on a personal computer. Optimization has gone from local to global.

In the late 70's and early 80's I worked with Professor D. G. Krige at Anglovaal Ltd. in South Africa where we pioneered the application of Geostatistics to resource estimation at the company's gold and copper mines. The price we paid was the toil of writing our own software. I remember well that Dr. J. M. Rendu and Mrs. G. Knox spent many months writing the Prieska Copper-Zinc Mine and the Gold Mines resource estimation systems through time sharing at the local university's main frame computer. Resources were estimated only once a year. Today several commercial systems exist and large mines estimate models that contain over 20 million blocks and several variables on a monthly or even daily basis.

A few months ago I visited one of the largest porphyry copper mines in Chile. The GPS system was down. Drilling rigs did not know where to drill the blast holes, shovels had lost the ore-waste dig limits. A lot of people were seized with panic. When we crushed in the early days we did it in a tricycle, today we do it in a Ferrari at 280 mph.

Today's systems such as those used to control large trucks and shovels generate real time databases that contain several tens of gigabytes of information. Linking these systems to other corporate ones, sorting and extracting useful information such as costs, equipment down time, cycles, etc. is a challenge on its own. Undoubtedly, today these data can be fed directly to mine planning and optimization systems that provide real time optimal allocations of equipment and maximize equipment availability. The level of efficiency and sophistication reached nowadays was never dreamed of before.

With today's revolutionary advances in computer and communications technology the trend seems to be the handling of vast amounts of data, summarizing and extracting useful information, linking to other corporate or global systems, examining and evaluating millions of alternatives for optimization, control and management decisions. If you examine the articles published in this book you will find that this is the global trend of research in our field, and I am certain that APCOM will continue to be the forum for discussing and sharing these experiences.

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