

How can the interactions between Statistics and Business be improved?

Reflections on a journey from Pure Mathematics to Management Consulting

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15 February 2012

I was an exchange student at Moscow State University 1964-65



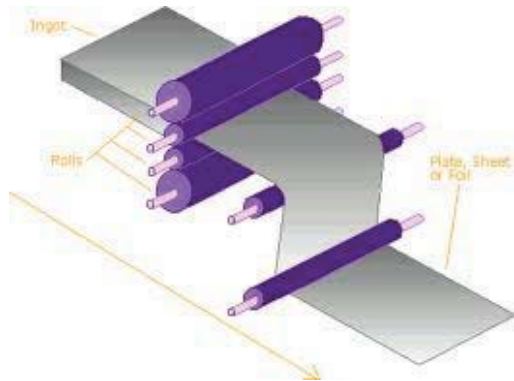
I first heard of DVJ from Boris Vladimirovitch Gnedenko



Agenda

- Statistics and Business
- Educating managers about statistics and statistical thinking
- Statisticians and strategic decision-making
- Looking forward

A schematic of a Rolling Mill

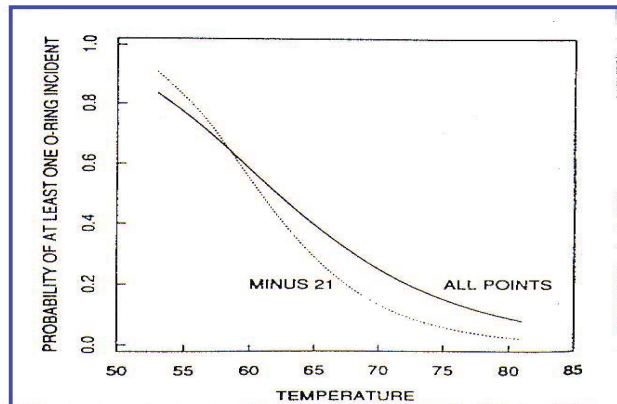


The data you looked at are those of the Challenger Space Shuttle O-ring failures



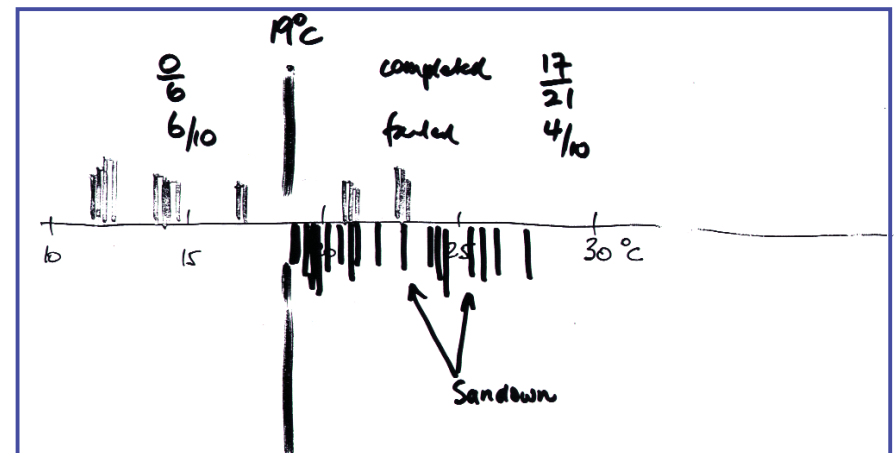
A formal analysis of the O-ring failure data

▲ O-ring failure in the Challenger Space Mission

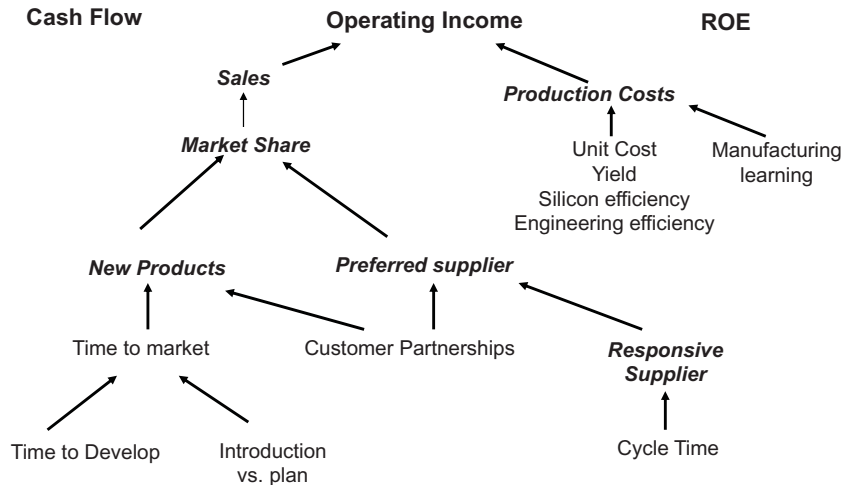


A managerial analysis of the O-ring failure data

▲ O-ring failure in the Challenger Space Mission



Even with linkages, the *Balanced Scorecard* for an electronic component manufacturer misses the point:



A managerial view of Six Sigma



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To be more effective helping businesses in the future, statisticians will need to:

- Be able to tease out the interdependencies, including the links to the bottom line
- Understand complex systems with a healthy dose of Systems Theory
- Be willing to advise on process as well as on content.

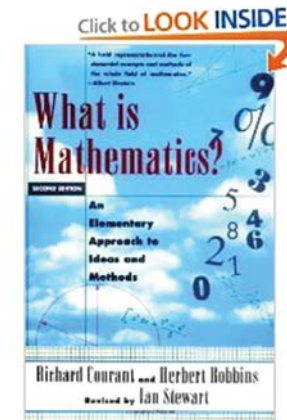
**Olga Sergeevna Akhmanova,
Dean of the Philological Faculty MGU, 1964**



Kolmogorov and pupils from his boarding school, Internat #18



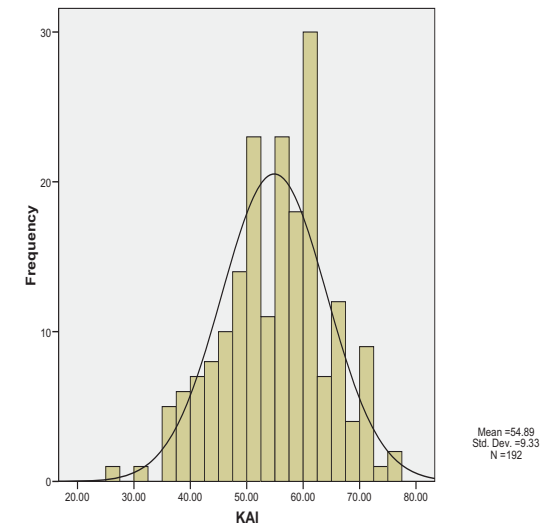
The text we used to teach English to bright mathematicians at Internat #18, 1964-65



How can we improve the teaching of statistics and statistical thinking to managers?

- Use business examples
- Concentrate on process rather than technical skills
- Use simulation to introduce distributions, extremes, outliers, and hypothesis testing
- Take account of cognitive style

KAI norms from 192 subjects (20 item scale).



There are two extremes of Cognitive Style:

Sensate

- Focus on details
- Search for facts
- Look at the present
- Concerned about practicalities
- Use conventional procedures
- Seek consensus
- Seek to do things better

Intuitive

- Focus on the big picture
- Search for patterns
- Look at the future
- Concerned with possibilities
- Restructure problems
- Are willing to upset
- Seek to do better things

Source: Kirton, JAP, 1976

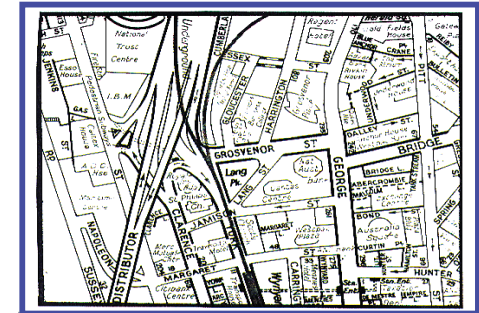
There are differences between strategic and operational issues:

▲ Do you need a compass or a street directory?

Go West



Go to 53 George Street



Two different ways of using mathematical/statistical thinking have been identified in the past



Boethius: *The Consolations of Philosophy* (14th C)

A typical assignment: help Adam develop the future direction of his company:

Anxious Adam:

41 year-old State Sales Manager for a Division of Company X that has a macho, competitive culture. Personable, action-oriented, ambitious and intelligent but with no formal education. Has been tasked to develop new products that will transform the company from a commodity player to a solutions provider.

He needs:

A well researched and compelling Report

Development of own knowledge and skills in strategy innovation

Frameworks and a process that can be used repeatedly

Cost containment

in order to:

Have a Report that will be praised and acted on by the Executive

Increase his self confidence and increase his standing in the organisation

Be allowed to 'play' again



Mathematicians/Statisticians have the ability to extract order from chaos – structuring solutions



How can Statisticians help in strategic decision-making?

- Framing the issue
- Structuring the solution
- Testing the logic; identifying risks

These roles require the support of specific skills:

- Being independent
- Asking the naive questions
- Knowing what a good outcome would look like
- Chairing efficiently
- Listening
- Dispensing tough love

The future:

Sharpen
your
company's
reflexes.

“While most companies focus first on automating customer contact through operational CRM software, a CRM strategy will not succeed long-term if it does not include an analytical component. Without analytics, the company will not be able to make sense of and act upon the data it is collecting through the operational system”

Meta Group on CRM



There is a ‘rosy’ future for some statisticians in business with the advent of enormous amounts of data available.

- Video from a Keynote Presentation by Hal Varian - Chief Economist, Google, to IBM’s 2008 Almaden Institute - "Innovating with Information".