

APPENDIX 3

REAL-TIME MANAGEMENT

A Science Fact Discussion

The two men had met for a light lunch were walking back to Bob Truscott's office.

'But surely, Bob', said Monty Finch, 'you still have regular reports each month, annual statements, and so forth?'

'Sure we do'. Bob smiled. 'Got to keep the place tidy, report to the shareholders - not to mention the tax man.'

'Then when you say real-time management you mean that your information is more timely, bang up to date.'

They were on the way up to Truscott's floor.

'It's that all right, Monty. In fact none of the data I work with is more than a day old. But it's what the data measure that matters.'

'Don't see that you can get away from production, sales, distribution, as per usual, and it all comes down to the bottom line, doesn't it?'

'Damn right it does', answered Truscott. 'That's taken as read. But what real-time management measures is incipient instability.' He motioned Finch to a comfortable arm-chair.

'Is what?' Finch collapsed into the chair.

'It will be easier to show you. Take a look around. This is the management centre. We threw out the boardroom, sold off the mahogany table and chairs, and built this instead. I spend most of my time in here.'

They were occupying two of the seven armchairs in a large, pleasingly decorated room. The decor had been designed to minimise the hi-tech flavour of the various screens that dominated the place. One of these, a metre high, and slightly wider, was illuminated. In very distinct red lettering on a pale green ground stood a message:

BOB TRUSCOTT. THURSDAY 02/03/89. 13:05

SLOPE CHANGE DOWNWARD IN SALES AFRICAN HOLDING

'Came on just after I went out to meet you', said Truscott. It relates to yesterday's results.'

'Impressive, but what the heck does it mean?'

'Let's find out.' Truscott closed his right hand over a numerical pad built into the upholstery of the armchair.

'Let's select the appropriate option from the menu in the side screen'. After pressing the appropriate keys the illuminated screen went blank, and immediately ran out the co-ordinates of a graph, calibrated in days on the horizontal axis. The title said:

AFRICAN HOLDING

SALES WEEKLY MOVING AVERAGE

The graph showed a good deal of fluctuation, but the last four points were on a downward path. The final one was marked with a flashing red arrow, pointing downwards.

'What do you think of that ?' asked Bob Truscott.

'Well...', Finch demurred. 'Couldn't that be a chance fluctuation?'

'Yes, it could', Truscott chuckled. 'This arrow is there to say that it probably isn't. In fact, it came because there is a high chance that a downward trend has set in. In short, my bit of Africa -the sales of our holding there- is incipiently unstable. It might recover, but it might not.'

'Questions, questions, questions !' Finch had clapped his hand to his forehead.

'I bet you have. Shoot, Monty.'

'How does it know ? If the thing is supposed to tell you if there are four points in a row, well, I could understand that might be a useful warning signal. But a high probability that a downward trend has set in, what does it mean?'

'The thing, as you called it, monitors all data as they come in, all the time. Take this graph. It looked at today's new point, and asked -as you did- if it were likely to be a chance fluctuation. It measured that probability, using an extremely elaborate and sensitive piece of software devised by mathematical statisticians. Most of the time, the new point is most probably a random movement - and so I don't get to hear about it, thank God. Next, the program asks itself if the point is likely to be a transient -you know, a bit of "noise" in the system, faulty data or whatever, that has no significance. If that's very likely, I don't get bothered with that either. Look closely at the graph, Monty. There are two huge peaks along the way - each marked a small up and down symbol. As you see, it was a good job I wasn't gotten out of bed for those fellows. Everything immediately returned to normal.'

'So the program produces probability measures for both chance variation and for transient variation for the same point?' Truscott nodded. 'So then it measures the probability of a slope change too, which is what we've got.'

'Correct', replied Truscott. 'There's a fourth estimate too. How if it's a step change? If a transient looking point isn't actually a transient, it might mark a total shift of level that will flatten out into a plateau'

'So. Now we have four probability measures associated with this one point. Next question: how does the system decide what to report? I suspect that if either the slope or step measure is, say, more than 70%, you will hear about it.'

'Shrewd question, Monty. As I think you're wondering, it's not that simple. Highly volatile measures might result in alerting signals more or less daily by comparison with the more placidly flowing series. I should become inundated with warnings, and end up a nervous wreck.'

'So ?'

'There are thousands of series in the organisation, and each has its own mathematical characteristics. That's really we're saying. So each series has to be specially "tuned", is the word we use. It means that the frequency of alerting will be geared to the management's ability to cope with them.'

'That doesn't sound very objective to me', said Finch.

'It was ever thus', Truscott responded. 'Science isn't objective, because it is inseparable from its own expectations and especially observations. Management the more so. But even so, real-time management is a complete breakthrough.'

'I think I'm getting it', Finch spoke thoughtfully. 'Do you reckon you could encapsulate the breakthrough for me in a neat epigram?'

'Oh yes', Truscott said, unruffled. 'Trouble with epigrams is that they sound fine, but may not be fully understandable. Here goes, anyway. If you manage through last month's results -or even yesterday's- the best you can do is learn from bitter (or sometimes happy) experience. If you manage incipient instability -here it comes- you can change the future.'

'Hey, that's philosophically heavy, Bob'.

'Oh I dunno. We do it in our own lives as a matter of course.'

'What do you mean?' asked Finch.

'Aw, c'mon' Truscott threw it away: 'If the TV set is on the blink the day before the World Series final, you check it out. If your car starts coughing, you check that out too. You don't wait for your life support systems to fail before you take action. Still less do you wait for your kid to die before consulting a medic. But the standard management procedures, with their built-in time-lags of at least a month -and in government's case probably much more- do exactly that. Most management meetings are post mortems.'

'I didn't learn that in the Business School', said Monty Finch, M.B.A.

'Nor did I. But the tools are designed for dealing with the business cadaver, aren't they? My business is a viable system. That's why I want to detect incipient instability. Then I can act, in advance of possible disaster.'

'It's wonderful, Bob. But what a job: you are storing thousands of graphs, and each time series has to be specially tuned. It has to be a vast data base, manned by how ever many mathematicians?'

'Hold it', Truscott said. 'The mathematical man-hours are already in the program. That's to say it's an expert system that will tune any series based in earlier experience. Second, we don't store graphs at all. I can call up a graph, for any of the indices in store, in any mode, and the computer will generate it. I could generate thousands of graphs. So in a sense they all exist, but most of them will never be seen. Economical, isn't it? In fact, Truscott ended, 'I've never seen this African graph before today.'

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