

**Hands on Systematic Innovation**by **Darrell Mann**

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Mann, D., Hands On Systematic Innovation – for Business & Management. IFR Press – Malaysia 2004, 538 pages.

Mr. Mann spent 15yrs with Rolls Royce ultimately becoming chief engineer and later an industrial fellow at the University of Bath focusing on systematic innovation research. Presently he is Blackswan's CTO, and, CEO & Technical Director of Systematic Innovation Ltd. – both management consulting companies. He has given courses to over 3000 on systematic innovation and is amongst the most widely published in the field (600+ papers & articles).

Primary/secondary sources reference the twenty-three chapters, e.g. Analytica [www.lumina.com](http://www.lumina.com), E. deBono "Serious Creativity" Penguin Books 1992, H.J. Linde "Innowis & Wois" keynote paper at TRIZcon2002 St. Louis.

The book is one volume of a two part series – the second focuses on the "Technical" side, whereas this looks at the macro view – "Business and Management". The philosophy is analyze one's specific situation, map it to a similar generic one, consider the world's best ideas for such, then deduce a customized solution. The text is structured into six unequal sections 1) introduction, 2) problem definition, 3) tool selection, 4) problem solving tools, 5) solution evaluation, and 6) future directions – deliberately supporting a pick'n'dip reading style. Pithy quotes intersperse throughout, e.g. "the average man would rather face death or torture than think (Bertrand Russell)". Systematic innovation requires – di/convergent & lateral thinking, pattern recognition, different thinking hats (deBono's spectrum), mind-mapping, and group psychology awareness. Perspective is enhanced by charting system v time (sub->super v past->future), neuro-linguistic programming layers (NLP), SWOT, association/dissociation matrix, & VAKOG analysis, plus "going around the loop again". Projected future evolution includes merging QFD (quality function deployment), Six Sigma, Lean, Sustainability, TOC (theory of constraints) and Kansei into the framework.

The core sub-processes are – "problem definition", and "solving" – one approach (chapter) for each is minimally necessary, though optimal combinations are explained. Drilling down to illustrate – "problem definition" (Ch5-9) is via problem/opportunity explorer, function and attribute analysis, S-curve analysis, IFR (ideal final result), and/or perception mapping. For example in IFR – one works backward from a perfect solution, asking what's preventing this, how problems can be overcome, resource availability, and considering evolutionary trends of others' solution taking multiple perspectives (system/time) into account. "Solving" (Ch11-21) can use conflict resolution via inventive principles, contradiction elimination, measurement standards, (non-)linear evolution trends, resources, knowledge, re-focus/frame, trimming, IFR, psychological inertia, and/or subversion analysis. The elimination of conflicts and making trade-offs are central to systematic innovation – the closest that readers will recognize as traditional TRIZ (Altshuller). The section's first chapter describes this approach – business conflict matrix and the 40 inventive principles. The conflict matrix (31x31) charts the parameter to be improved against that which gets worse. Row-column intersections contain a list of inventive principles applicable to resolve the paradox. The 31 business conflict matrix parameters are, e.g. 1) R&D spec/capability/means... 26) convenience... For each there is – a list of inventive principles that improve the parameter, a decreasing order of frequency list, and a list of principles relevant to each specific worsening parameter. Analyzing ~3million successful solutions (e.g. via patent filings) from all areas of human endeavor (science, art, politics, engineering, business) researchers have discovered (just) 40 inventive principles, e.g. 1) segmentation... 4) asymmetry... If the conflict matrix does not work then strategies include using the generic most commonly used principles-sequence, or a selection based on the improving parameter. A simplified "Scamperr-model" (5x3 matrix) is proposed to provide yet another perspective. Extrapolating – a non-minimalist approach requires the knowledge and use of many complex tools.

Qua TRIZ *per se* the accompanying (Technical) volume seems a must. An interactive DVD/online-course would help comprehension bringing the material to life. More case based examples with clear linkage (causality) between problems & solutions, plus sample extractions of inventive principles from patent databases would be helpful.

Overall – recommended with reservation: a massive piece of work, intriguing and difficult read since it's clearly the basic textbook for an extended course in the field – maybe enough for a master's degree? The topic requires lecturing, tutoring, application and practice to grasp/absorb the concepts enough to become an effective practitioner.