

ASIGURAREA CALITĂȚII – QUALITY ASSURANCE

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Quality Management versus Risk Management

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Abstract

The purpose of this paper is to analyse the field of risk management in relation to the connection to quality management. It poses and attempts to answer three important questions: What can quality teach risk management? What can risk management teach quality? And what must both risk and quality management still learn? This is an area, which has so far not been explored by the quality management fraternity. The examination is built on more than twenty years experiences in the area of quality management and extensive involvement in recent developments around risk management (e.g. the Australian/New Zealand standard for risk management (AS/NZ4360), the development of a risk management model by the European Foundation for Quality Management, and the launch of risk based instruments by a number of private companies). Amongst the major findings are that there are three types of risks – predictable risks that organisations know they face; the risks which an organisation knows it might run but which are caused by chance; and the risks which organisations do not know they are running. The paper outlines how the quality management discipline can help with the management of these types of risks. It is pointed out that in the past the challenge for quality management professionals was to support process and design improvements but the challenge in the future is to improve relationships in order to reduce and manage the most important risks.

Keywords: Risk Management, Quality Management, quality model, risk model, standard, EFQM, teaching.

References:

- [1] Antonovsky, A. (1997), *Unravelling the mystery of health: How people manage stress and stay well*, Jossey-Bass, San Francisco.
- [2] Antonovsky, A. (1993), “The structure and properties of the sense of coherence scale”, *Social Science and Medicine*, Vol.36, pp.725-733.
- [3] Australia and New Zealand Standard on Risk Management AS/NZS 4360 (2004), Standards Australia, Sydney, and Standards New Zealand, Auckland.
- [4] Australia New Zealand Handbook; Risk Management Guidelines Companion to AS/NZS 4360 (2004), Standards Australia, Sydney, and Standards New Zealand, Auckland.
- [5] Baro, F., Haepers, K., Wagenfeld, M. and Gallagher, T. (1996), “Sense of Coherence in caregivers to demented elderly persons in Belgium”, In: Stefanis, C., Hippus, H. and Muller-Spahn, I.F. (Eds.), *Neuropsychiatry in Old Age: an Update*, Toronto, Hogrefe and Huebr Publishers, pp.145-156.
- [6] Basel Committee on Banking Supervision (1996), *Update on work on a new capital adequacy framework*, Basel.

- [7] Basel Committee on Banking Supervision (2003), Advanced measurement approaches for operational risk, Supervisory Expectations, May.
- [8] Bazerman, M.H. and Watkins, M.D. (2004), Predictable surprises; the disasters you should have seen coming, Harvard Business School Press, Boston.
- [9] Bowen, G.L., Mancini, J.A., Martin, J.A., Ware, W.B. and Nelson, J.P. (2003), “Promoting the Adaptation of Military Families: An Empirical Test of a Community Practice Model”, *Family Relations*, Vol.52, No.1, p.33.
- [10] Chenhall, R.H. (2003), “Management Control Systems design within its org context”, *Accounting Organisations and Society*, Vol.28, pp.127-168.
- [11] Committee of Sponsoring Organisations (COSO) of the Treadway Commission (2004), Enterprise Risk management Framework, American Institute of Certified Public Accountants, <http://www.aicpa.org>
- [12] Conti, T. (1997), Organizational self-assessment, Chapman and Hall, London.
- [13] Coyle, J. and Schnarr, N. (1995), “The soft-side challenges of the ‘virtual corporation’”, *Human Resource Planning*, Vol.18, No.1, pp.41-42.
- [14] Davidow, W. and Malone, M. (1992), “Virtual Corporation”, *Forbes*, pp.102-107.
- [15] Deming W.E. (1986), *Out of the Crisis*, MIT Centre of Advanced Engineering Study, Cambridge, Mass.
- [16] Dunnett, R.S., Levy, C.B. and Simoes, A.P. (2005), Managing operational risk in banking, *McKinsey Quarterly*, No.1.
- [17] European Foundation for Quality Management (2004), EFQM Excellence model, Brussels.
- [18] European Foundation for Quality Management (2005), EFQM Framework for Risk Management, EFQM, Brussels (to be published).
- [19] Frey, S.C. Jr. and Schlosser, M.M. (1993), “ABB and Ford: Creating value through cooperation”, *Sloan Management Review*, Vol.35, No.1, pp.65-72.
- [20] Geiger, H. (2000), Regulating and Supervising Operational Risks for Banks, Paper given at Conference ‘Future of Financial Regulation’, Tokyo, 17 October.
- [21] George, M.L. (2002), *Lean Six Sigma: Combining six sigma quality with lean production speed*, McGraw-Hill.
- [22] Grabowski, M. and Roberts, K. (1999), “Risk mitigation in virtual organisations”, *Organisational Science*, Vol.10, No.6, pp.704-722.
- [23] International Organisation for Standardisation (2000), ISO 9000:2000 quality management system standard, ISO, Geneva.
- [24] Juran, J.M. and Blanton Godfrey, A. (1998), (Editors), *Juran’s Quality Handbook*, McGraw-Hill Companies, 5th edition.
- [25] Juran, J.M. (1989), *Juran on Leadership for Quality: An Executive Handbook*, The Free Press, New York.
- [26] Kaiser, C. F., Sattler, D. N., Bellack, D. R., and Dersin, J. (1996), “A conservation of resources approach to a natural disaster: Sense of coherence and psychological distress”, *J. Soc. Behav. Person*, Vol.11, pp.459–476.
- [27] Larsson, G., Kallenberg, K., Setterlind, S. and Starrin, B. (1994), “Health and loss of a family member: Impact of Sense of Coherence”, *International Journal of Health Sciences*, Vol.5, pp.5-11.
- [28] Malcolm Baldrige National Quality Award (2005), *Criteria for Performance Excellence*, ASQ, Milwaukee.
- [29] Mayer, R.C, Davis, J.H, Schoorman, F.D. (1995), “An integration model of organizational trust”, *Academy of Management Review*, Vol.20, No.3; pp.709-734.
- [30] McAllister, D.J., “Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations”, *Academy of Management Journal*, Vol.38, No.1, p. 24-59.
- [31] Mittelstaedt R.E. Jr. (2005), *Will your next mistake be fatal? Avoiding the chain of mistakes that can destroy your organisation*, Wharton School Publ., Upper Saddle River.

- [32] Newton, P., Paxson, D.A. and Widdicks, M. (2004), “Real R&D Options”, International Journal of Management Research, Vol.5/6. No.2, pp.113-130.
- [33] Power, M. (2003), The invention of operational risk, Centre for Analysis of Risk and Regulation (ESRC), London School of Economics, London, discussion paper, No.16.
- [34] Roberts, J. (2004), The Modern Firm, University Press, Oxford.
- [35] Senge, P. (1999), “It’s the learning: The real lesson of the quality movement”, Journal of Quality and Participation, Vol.22, No.6, p.34-40.
- [36] Shewhart W.A. (1931), Economic control of quality of manufactured products, D. van Nostrand Co Inc, New York.
- [37] Shostack , G.L. (1987), “Service positioning through structural change”, Journal of Marketing, Vol.51, No.1, pp.34-43.
- [38] Viviers, A.M. and Cilliers, F. (1999), “The relationship between salutogenesis and work orientation”, Journal of Industrial Psychology, Vol.25, No.1, pp.27–32.

Quality Politics: Costs and Return of Investments

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Abstract

This paper analyses some issues concerning the economic aspects of quality. The quality management system holds a vital place in the company's structure but sometimes requires important operating costs. These costs are known as Quality Obtaining Costs (QOC) and may be considered as an investment. Planning an investment, means evaluating its return in order to see if it is profitable or not. Measuring the return of quality politics investment raise some delicate problems. We may calculate some aspects of the return of investment by measuring the shape of non-quality costs. An eventual decrease of these costs could be synonym with a profitable investment. But the advantages of good quality politics cannot be measured only by taking into consideration the non-quality costs (even if they include direct and indirect costs). There are also intangible advantages (like mark image, competences, polyvalence, client's satisfaction...) that derive from quality approaches. How to evaluate this type of consequences / advantages? The idea developed in this article is to considerate the quality politics like un immaterial/intelligent investment. Therefore could it be advantageous / possible to use the immaterial investment's measuring and evaluation techniques for studying the quality politics return of investment?

References:

- [1] J.A.F. Stoner and F.M. Werner, "Managing Finance for Quality", ASQC Quality Press, Wisconsin, 1994.
- [2] A.Y. Portnoff and V. Lamblin, "Le capital reel des organizations", *Futuribles*, No. 288, July-August 2003.
- [3] M. Hirschey and J.J. Weigandt, "Amortization policy for advertising and research and developpement", *Jurnal of Accounting Research*, No.23, 1985.
- [4] L. Edvinsson, "Developing Intellectual Capital at Skandia", *Long Range Planning*, Vol.30, June 1997.
- [5] W.E. Deming, "Out of the crisis", (SPC Press), 1982 .
- [6] C. Robledo, R. Lupan, "Measuring the Shareholder Value after the ISO 9000 Quality System Certification", *The 3rd International Conference in Management of Technological Change*, Chania, Greece, 29-30 August 2003.
- [7] L. A. Schlesinger, J. L. Heskett, „Breaking the cycle of failure in services“, *Sloan Management Review*, 1991.
- [8] W. A. Shewhart, "Statistical Method from the Viewpoint of Quality Control", *The Graduate School, U.S. Department of Agriculture*, Washington, 1939.

- [9] J M Juran and others, “Quality Planning and Analysis: From Product Development Through Use”, McGraw-Hill, 1980.
- [10] W. E. Deming, “Quality Productivity and Competitive Position”, Massachusetts Inst Technology; June, 1982.
- [11] T. Pyzdek, “The Six Sigma Handbook, Revised and Expanded : The Complete Guide for Greenbelts, Blackbelts, and Managers at All Levels”, McGraw-Hill; 2 edition, March, 2003.
- [12] E. M. Goldratt, “Theory of Constraints”, North River Press; December, 1999.
- [13] P. Caspar and Ch. Afriat, “L’investissement immatériel. Essai sur l’économie de l’immatériel”, Economica-Centre de Prospective et d’Evaluation, Paris, 1988.
- [14] G. Murard and M. Ternisien, “Le traitement des investissements incorporels en économie d’entreprise”, Creaflux pour le Commissariat général au plan, septembre 1987.
- [15] Sofaris, “L’investissement en “matière grise” des PME”, February 1988.
- [16] B. Martory, Ch. Pierrat, Ch. Thibierge and Ch. Hoarau, “Evaluation et rentabilité de l’investissement intellectuel”, rapport for the Research Minister, Paris, December 1993.
- [17] C. Pierrat and B. Martory, “La gestion de l’immatériel”, Nathan editions, Paris, 1996.
- [18] J.-Y. Prax, “Le guide de Knowledge Management”, Dunod, Paris, 2000.
- [19] K.E. Sveiby, “Knowledge management, la nouvelle richesse des entreprises”, Maxima, Paris, 2000.
- [20] C. Pierrat, “Immatériel et comptabilité”, Encyclopédie de Comptabilité, Contrôle de Gestion et Audit, Economica, Paris, 2000.
- [21] ISO 9000:2000 „Quality Management System-Requirements“.
- [22] M. Harry & R. Schroeder, “Six Sigma. The Breakthrough Management Strategy Revolutionising the World’s Top Corporations”, New York, Doubleday, 2000.
- [23] P. Lorino, “Méthodes et pratiques de la performance”, Editions d’Organisations, Paris, 2003.
- [24] I. Bacivarov, .A. Stoichitoiu and A. Kobi, “Quality and Dependability”, Mediarex 21, Bucharest, 2008.

Reliability Considerations at Nanometer Scale

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Abstract

This paper analyses some aspects concerning the reliability at nanometer scale. Although higher reliability is expected from submicron and nanotechnology so far only a few attempts have been made to apply reliability theory to submicron and nanodevices. The way to reliable nanotechnology is to identify relevant physical failure mechanisms and corresponding failure rates, determine reliability indices, and investigate reliability models down to nanoscale including quantum processes. Perhaps the most significant problem concerns the sensitivity of future IC generations face to various noise sources, and in particular face to energetic particles. This paper analyses some of the above problems. At the same time, we propose the implementation of a new soft error detecting technique based on time redundancy.

Keywords: Reliability, Fault tolerance, Redundancy, Submicron and nanodevices, Soft-error.

References:

- [1] M. Nicolaidis, Time Redundancy Based Soft-Error Tolerance to Rescue Nanometer Technologies, in Proceedings of the 17th IEEE VLSI Test Symposium, April 1999-07-12.
- [2] M. Alexandrescu, A Bacivarov, Tehnici de toleranță la defectări în circuitele CMOS submicronice, UPB, 2000.
- [3] U. Sennhauser, J. Reiner, P. Nellen, Nanoreliability, in Proceedings of 13th NID Workshop, 04-06 February 2004, Athens, Greece.
- [4] J.C. Reiner, P. Gasser, U. Sennhauser, Novel FIB- based sample preparation technique for TEM analysis of ultra thin gate oxide breakdown, in Microelectronics and Reliability, vol. 42, 2002.
- [5] S. Paul, C. Pearson, A. Molloy, M.A. Cousins, M. Green, S. Kolliopoulou, P. Dimitrakis, P. Normand, D. Tsoukalas M.C. Petty, Langmuir-Blodgett Film Deposition of Metallic Nanoparticles and their Application to Electronic Memory Structures, in Nano Letters, 3(4), 533-536 (2003).
- [6] M. Nicolaidis, N. Achouri, L. Anghel, Memory Built-In Self-Repair for Nanotechnologies, in IEEE International On-line testing Symposium, July 2003, Kos, Greece.
- [7] M. Nicolaidis, N. Achouri, L. Anghel, A Memory Built-In Self-Repair for High Defect Densities Based on Error Polarities, in IEEE Defect and Fault Tolerance Symposium, November 3-5, 2003 – Cambridge, MA, U.S.A.
- [8] M. Nicolaidis, N. Achouri, L. Anghel, A Diversified Memory Built In Self Repair Approach for Nanotechnologies, in IEEE VLSI Test Symposium, April-May 2004, Napa Valley, CA, USA.
- [9] D. Alexandrescu, L. Anghel, M. Nicolaidis, New Methods for Evaluating the Impact of Single Event Transients in VDSM Ics, in Proceedings of the 17th IEEE International Symposium on Defect and Fault-Tolerance in VLSI Systems, 6-8 November 2002, Vancouver, Canada.
- [10] C. Roman, S., Mir B. Charlot, Building an analogue fault simulation tool and its application to MEMS, in Microelectronics Journal, Vol. 34, No.10 , 897-906 , 2003.

Superconductivity Applications and Reliability

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Abstract

After a short introduction, the most important problematical issues are presented. The paper – intended to inform the non-specialists and decision makers – explores advanced superconductivity solutions for next generation micro- and nano-electronics in key applications areas.

Keywords: superconductivity, properties, challenges, reliability, critical temperature, applications, single flux quantum (SFQ).

References:

- [1] Wheeler, F., and P. Freilinger, “Superconductivity”, <http://teachers.web.cern.ch/teachers/archiv/HST2001/accelerators/superconductivity/superconductivity.htm>.
- [2] Onnes, H. K., *Commun. Phys. Lab. Leiden*, 140c (1914); reprinted in *Proc. K. Ned. Akad. van Wetenschappen (Amsterdam)* 17 (1914), p. 278.
- [3] Meissner, W, and R. Ochsenfeld, *Naturwissenschaften*, Issue 21 (1933), p. 787 [in German].
- [4] Josephson, B. D., *Phys. Lett.*, Issue 1(1962), p. 251.
- [5] Uchida, S., “Forefront in the Elucidation of the Mechanism of High-Temperature Superconductivity”, *Japanese Journal of Applied Physics*, Vol. 51 (2012), pp. 010002-1 to 010002-5.
- [6] Kitazawa, K., “Superconductivity: 100th Anniversary of Its Discovery and Its Future”, *Japanese Journal of Applied Physics*, Vol. 51 (2012), pp. 010001-0100014.
- [7] Kuwano, Y., *The Economist*, 67 [34] (1989) 60.
- [8] Kumakura, H., “Development and Prospects for the Future of Superconducting Wires”, *Japanese Journal of Applied Physics*, Vol. 51 (2012), pp. 010003-1 to 010003-6.
- [9] *** “Superconducting magnetic energy storage,” http://en.wikipedia.org/wiki/Superconducting_magnetic_energy_storage. “Superconductivity – Present and Future Applications,” http://www.ccas-web.org/pdf/ccas_brochure_web.pdf