

take significant time from the end-user's daily tasks and occasionally duplicate software applications already in use elsewhere in the organisation.

As part of the research some underlying issues will be identified. The main concentration will be on determining who the end users are in the organisation, what they do as part of the daily roles and what training, if any, they have been subjected to in order to enhance their end-user computing and end-user development skills.

It is important to note that all of this can be investigated but, as identified clearly by Cotterman and Kumar (1989), it is an essential part of any study into EUC that the users be clearly defined. To this end a thorough investigation of the Cotterman and Kumar model in terms of today's technology and user skill must be undertaken.

Many researchers have briefly looked at the strategies required to improve the end-user development of applications but to this point no researcher has investigated the implementation of these strategies and their impact on the individual and the organisation. The answer to this question will not only identify who the end-user developers are in the case organisations but also the tasks they are undertaking and the applications they are developing. By identifying issues such as cultural background and end-user environment it is expected that the researcher will develop an identification model to assist in the early detection of end-user developers giving direct line managers the capacity to implement management strategies more effectively.

#### TYPE OF STUDY

This study will be undertaken using an exploratory approach to investigate the questions posed by utilising a case study format. Qualitative research techniques of interview and focus group will be utilised in conjunction with an initial questionnaire to determine demographic and end-user classification information. The results of the qualitative and quantitative methods used will be analysed through an interpretive viewpoint. Interpretivism is 'concerned with approaches to the understanding of reality and asserting that all such knowledge is necessarily a social construction and thus subjective' (Walsham, 1993, p5). The interpretive approach can potentially 'produce deep insights into information systems phenomena' as it assists researchers in understanding 'human thought and action in social and organizational contexts' (Klein & Myers, 1999, p67).

Walsham (1993, p4-5) stated that interpretive methods of research are 'aimed at producing an understanding of the *context* of the information system, and the *process* whereby the information system influences and is influenced by its context'. The major criteria for being a case organisation in this study are that end-user application development happens to some extent within the organisation by at least two employees and that these employees report to a direct line manager. To analyse the impact of this development the most obvious approach will be to

investigate the *process* of the application development within the *context* of both the organisation and the end-user developer.

Brancheau and Brown (1993, p472) identified case studies would play an important part in the future research into EUC stating 'they are uniquely suited to open-ended, detailed investigation of EUC phenomena'. The case study approach has been identified as being one of the most appropriate methods for conducting Information Systems empirical research in the tradition of interpretation and generally involves the use of more than one case study in order to allow for comparison (Walsham, 1993). This approach will allow the researcher to investigate the impacts of end-user developed applications on the organisation by interviewing the users and their direct managers and thus developing a case based view of different organisations.

#### REFERENCES

- Alavi, M. & Weiss, I.R. (1985). Managing the Risks Associated with End-User Computing, *Journal of Management Information Systems*, 2(3), 5-20
- Brancheau, J.C., & Brown, C.V. (1993). The Management of End User Computing: Status and Directions, *ACM Computing Surveys*, 26(4), 437-482
- Chan, Y.E. & Storey, V.C. (1996). The use of spreadsheets in organizations: Determinants and consequences, *Information & Management*, 31(3), 119-134
- Cotterman, W.W. & Kumar, K. (1989). User Cube: A Taxonomy of End-users, *Communications of the ACM*, 32(11), 1313-1320
- Doll, W.J. & Torkzadeh, G. (1989). A discrepancy model of end-user computing involvement, *Management Science*, 35(1), 1151-1171
- Govindarajulu, C. (2003). End Users: Who Are They?, *Communications of the ACM*, 46(9), 152-159
- Klein, H.K. & Myers, M.D. (1999). A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems, *MIS Quarterly*, 23(1), 67-94
- Leithseier, R.L. & Wetherbe, J.C. (1986). Service Support Levels: An Organized Approach to End User Computing, *MIS Quarterly*, 10(4), 337-349
- McBride, N. & Wood-Harper, A.T. (2002). Towards User-Oriented Control of End-User Computing in Large Organizations, *Journal of End User Computing*, 14(1), 33-42
- McGill, T. (2002). User Developed Applications: Can End Users Assess Quality?, *Journal of End User Computing*, 14(3), 1-15.
- Powell, A. & Moore, J.E. (2002). The focus of research in end user computing: where have we come since the 1980s?, *Journal of End User Computing*, 14(1), 5-22
- Rockart, J.F. & Flannery, L.S. (1983). The Management of End User Computing, *Communications of the ACM*, 26(10), 776-784
- Walsham, G. (1993). *Interpreting information Systems in Organisations*, John Wiley & Sons, Chichester

# “...Some People Achieve Greatness...”: A Study Correlating Early Vocational Behaviour with Ultimate Vocational Achievement

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#### EXECUTIVE SUMMARY

Discovering the right people for the job, any job, is a complex, frustrating and often fruitless activity. In recruiting graduates, employers are not simply looking for someone to do a job, they are more likely seeking to take on candidates

who have the potential to rise to the highest ranks within organisations. They are seeking those candidates who, a decade hence, will be seen as high-achievers, but identifying such potential in fresh graduates has proven to be elusive. While the decision support role of Information Systems should be considerable

within this domain, in fact an IS framework founded on actual vocational data is entirely lacking.

The crux of this research is to generate and analyse that data in order to determine whether known high-achieving employees exhibited signature behaviour when they were raw recruits almost a decade earlier. It is proposed that the results from this research be used as enabling knowledge for the development of sophisticated assessment simulation Information Systems, whereby signature behaviour may be potentially stimulated and evaluated. In particular the research seeks to establish:

1. Can future vocational outcomes be accurately predicted by initial vocational behaviour?
2. How does initial vocational behaviour relate to an individual's ultimate potential?
3. How may an understanding of vocational behaviour be integrated into a design framework for predictive assessment Information Systems?

If successful, the outcomes of this PhD project could provide a model upon which future candidate assessment information systems are predicated.

## BACKGROUND

In his 1979 book (Wolfe, 1979) describing America's National Aeronautical and Space Administration's (NASA's) recruitment process to find the early astronauts, the author is reduced to describing successful applicants as having the "right stuff". Wolfe makes it clear that a mixture of abilities, background and "correctness" were prescribed as selection criteria, even though this filter eliminated arguably the finest test pilot of the day, Chuck Yeager. In the absence of more definitive data, this vague and overarching evaluation adjective "right-stuff" is still used today to retrospectively describe individuals who rise to become high-potential industry achievers.

In an attempt to specify their ideal graduate profiles to either recruitment agencies or internal human resource departments, corporate directors and managers often bemoan the time, complexity, obtuseness, cost and effective failure of the entire recruitment process. When pressed, they say "I know this is important for us, that's why I put the time in. But I really just want them to find me another two grads like him." As they say this they will often point through frosted glass to a bright-eyed staff member whom they employed the previous year and who has proven to be everything they expected of a new graduate, in fact a "golden employee".

Is it possible to predict such high-potential employees at a very early stage? Would such candidates exhibit particular key behaviour if placed in a work-based scenario, such that an accurate prediction of their vocational potential could be made? In part, the research goal of this project aims to answer the question, does such signature behaviour exist?

## METHODOLOGY

A quantitative approach was determined to be most appropriate for this research, data mining and statistical techniques were utilised to generate and assess correlations between variables in the data. The instrument designed to generate and gather the data is briefly outlined here.

Earlier valuable research in this area has been based upon retrospective survey data using content and factor analysis e.g. (Lombardo & Eichinger, 2000) in an effort to verify a "hunch" that a particular factor was key signature behaviour (in the case of Lombardo & Eichinger the postulated key behaviour was post-appointment learning ability.).

For reasons of real-world validation and because this research will bootstrap and is key to proposed further work on simulator development, the author of this research sought to determine if actual vocational data could be accessed and if so, what would be its optimum form and how could the data be obtained. Several assumptions guided the course of actions culminating in the data gathering instrument.

**Assumption 1:** Signature behaviour may be observed over a relatively short period of time due to an individual's particular reaction to a particular set of vocational circumstances. This assumption led to the conclusion that, if an average "golden employee" takes 6 to 10 years to establish ultimate vocational

success within a large New Zealand company (this condition based on anecdotal evidence), then vocational behaviour data collected over a 3–4 month period should prove sufficient to generate evidence of signature behaviour.

**Assumption 2:** That signature behaviour is more likely to be observed within data of relatively fine granularity. It is simply more plausible that the greater the number of recorded time periods in a single working day the more accurate will be the picture of individual behaviours rather than a set of behaviours all classified together under a daily collective code.

**Assumption 3:** That an employer of substance would be required for this research project, one which annually employed a significant number of graduates and which could be easily and logically subdivided into hierarchically organised departments.

**Assumption 4:** That the data collected would be of a highly sensitive nature both internally and commercially and that simply approaching a company and asking to see their employees timesheets records for the past 3 months would not be a reasonable course of action. This assumption led to the formulation of an 8 year association with one of the leading accounting practices in New Zealand and the design and development of a nationwide practice management system.

**Assumption 5:** That in order for the data to be valid it would need to be verified as correct, internal to the employers organisation. This assumption led to a major increase in scope of the practice management system and to the decision that customer billing data would be generated from the employee behaviour data.

**Assumption 6:** That, despite the passage of 8 years, the employer would remain willing and able to provide data on the vocational progress of the employees involved in the study. Happily, this assumption proved correct despite a significant change in personnel. This final batch of data was collected in 2006.

## STAGE OF THE RESEARCH

The author is two years into a part-time PhD research program. To date it has been a voyage of discovery in an attempt to narrow the conceptual scope and discover the true focus of the project. Initially, a deconstructionist model was adopted, which asked why a particular human being behaved in a particular way. It was felt that if the behaviour of hi-potential candidates/employees could be accurately analysed in this way the knowledge learnt could be applied to compare prospective employees. There is a great deal of literature which adopts this deconstructionist approach to analyse an individual's behaviour particularly in terms of facets of personality. Conceptually, the research model for this project is shown in figure 1, with each contributing body of knowledge appearing as a node, providing input to the central trunk.

As the work has progressed, so the nodes have increased in number until, during a recent re-evaluation a further significant factor was identified as being absent from the study and "fitted" to the original model. This produced the concept model shown in figure 2, which brought into question the validity of the original concept.

Figure 1

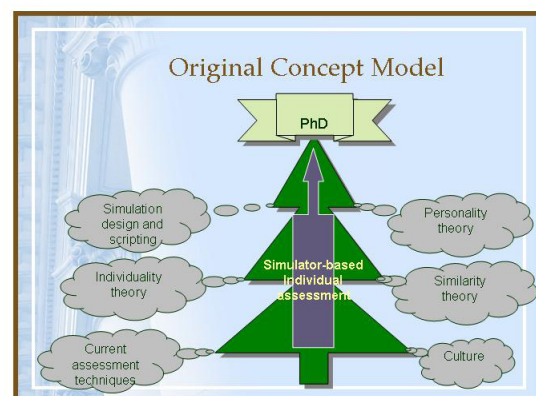


Figure 2

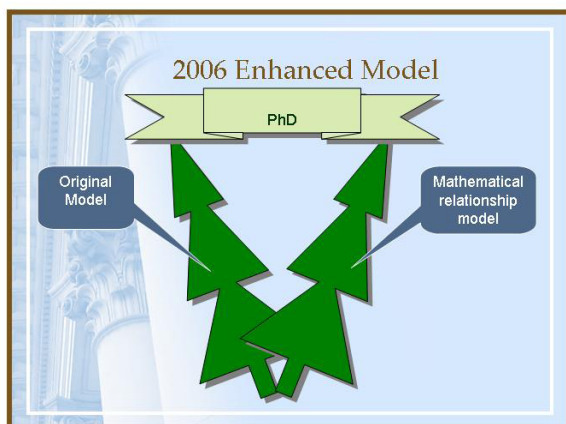
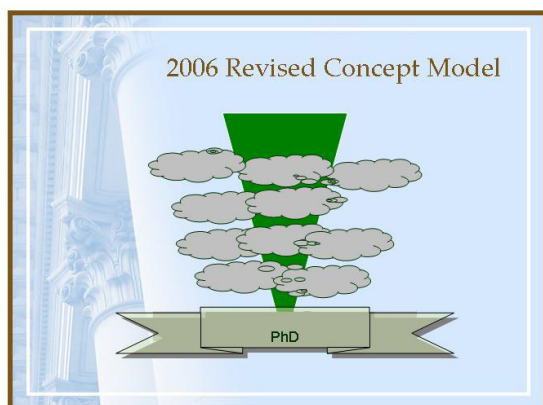


Figure 3



It was felt that this model lacked elegance, clarity and a discernable timetable for completion, indeed feedback from academic advisors declared this concept to contain not one but ten PhDs. A rethink was in order and by re-examining the contributing nodes and loosely applying input/output relationships to them a new concept model was developed, as shown in figure 3.

This model placed the PhD study not at the top but at the bottom, examining the node representing the enabling body of knowledge upon which all other aspects of the initial project were predicated. The research problem at the heart of this project and covered by this bottom-line node of knowledge considers whether, in a group of employees, vocational behaviour at the start of their careers can be correlated with their vocational achievement over a prolonged period of time.

The bibliography generated is included below for reference; the data has been gathered and is awaiting analysis via data-mining and statistical techniques. The current timeline sets completion of the PhD study to June/July 2008.

## REFERENCES

\*Bibliography generated by literature review so far:

- Agarwal, R., & Ferratt, T. W. (1999). *Coping with labour scarcity in information technology*. Cincinnati, Ohio: Pinaflex Educational Resources.
- Aha, D. W. (1992). Tolerating noisy, irrelevant and novel attributes in instance-based learning algorithms. *International journal of man-machine studies*, 36, 267-287.
- Ambition\_recruitment. (2005). *Market trends and salaries report*. Retrieved 21/11/2005, 2005, from <http://www.ambition.com.au/PageSys/DocView.aspx?DocumentID=206>
- Autherson, R. (2003, February 28). Banking on change. *Career times*.
- Baillie, L. (2003). *IT employers' skills demands: Do they know what they want?*
- Bassok, M., & Medin, D. L. (1997). Birds of a feather flock together: Similarity judgements with semantically rich stimuli. *Journal of memory and language*, 36, 311-336.
- Berno, T., & Ward, C. (2003). *Cross-cultural and educational adaptation of asian students in new zealand*. Retrieved 30/11/04, 2004, from <http://www.asia2000.org.nz/about/programmes/research/various/Ward%20and%20Berno%20report.pdf>
- Bernstein, L. E., Demorest, M. E., & Eberhardt, S. P. (1994). A computational approach to analysing sentential speech perception: phoneme-to-phoneme stimulus/response alignment. *Journal of the acoustical society of America*, 95, 3617-3622.
- Borg, I., & Groenen, P. (1997). *Modern multidimensional scaling. Theory and applications*. New York: Springer.
- Buros-Centre-For-Testing. (2006). *Mental Measurements Yearbook*. Retrieved 13/02/06, 2006, from <http://www.unl.edu/buros/>
- Bush, R. R., & Mosteller, F. (1951). A model for stimulus generalisation and discrimination. *Psychological review*, 58, 413-423.
- Carr, N. (2004). *Does IT matter*: Harvard business school press.
- Carroll, J. D., & Wish, M. (1974). Models and methods for three-way multidimensional scaling. In D. H. Krantz, R. C. Atkinson & R. D. Luce (Eds.), *Contemporary developments in mathematical psychology* (Vol. 2, pp. 57-105). San Francisco: Freeman.
- Caspi, A. (2000). The child is father of the man: Personality correlates from childhood to adulthood. *Journal of Personality and Social Psychology*, 78, 158-172.
- Cortier, J. E. (1987). Similarity, confusability and the density hypothesis. *Journal of experimental psychology: general*, 116, 238-249.
- Cortier, J. E. (1988). Testing the density hypothesis: Reply to Krumhansl. *Journal of experimental psychology: general*, 117, 105-106.
- Cox, T. F., & Cox, M. A. A. (1994). *Multidimensional scaling*. London: Chapman & Hal.
- Crooks, T. (2004). *Tensions between assessment for learning and assessment for qualifications*. Paper presented at the 3rd Conference of Commonwealth Examinations and Accreditation Bodies (ACEAB), Nadi.
- Dillingham, S. (2002). *New Zealand workforce: qualifications and evidence of upskilling*, from <http://www.dol.govt.nz/PDFs/new-zealand-labour-upskilling.pdf>
- Dipboye, R. L. (1982). Self-fulfilling prophecies in the selection-recruitment interview. *Academy of management review*, 7(4), 579-586.
- Drennan, L. (2001). Quality assessment and the tension between teaching and research. *Quality in Higher Education*, 7(3), 167-178.
- Eisler, H., & Ekman, G. (1959). A mechanism of subjective similarity. *Acta Psychologica*, 16, 1-10.
- Estes, W. K. (1994). *Classification and cognition*. New York: Oxford university press.
- Everitt, B. S., & Rabe-Hesketh, S. (1997). *The analysis of proximity data*. London: Arnold.
- Fernandez, R. M., & Weinberg, N. (1997). Sifting and sorting: personal contacts and hiring in a retail bank. *American sociological review*, 62(6), 883-902.
- Fitzsimons, M. (2004). Managerialism and the university. *New Zealand Journal of Tertiary Education Policy*, 1(1), 16-18.
- Forio-Software. (2006). *Leadership Simulation*, from <http://www.forio.com/index.htm>
- French, S. (2002). Genetic testing in the workplace: the employer's coin toss. *Duke Law Technology Review*, 0015.
- Frisch, S. A., Broe, M. B., & Pierrehumbert, J. B. (1995). *The role of similarity in phonology: Explaining OCP-place*. Paper presented at the 13th Annual congress of the phonetic sciences, Stockholm.
- Garner, W. R. (1974). *The processing of information and structure*. New York: Wiley.
- Garrison. (2005). *Plus-32 Employment Testing*, from [www.Plus-32.com](http://www.Plus-32.com)
- Geertz, C. (2000). *Available light: Anthropological reflections on philosophical topics*. Princeton, NJ: Princeton University Press.
- Gentner, D., & Ratterman, M. J. (1991). Language and the career of similarity. In S. A. Gelman & J. P. Byrnes (Eds.), *Perspectives on language and*



- thought interrelations in development (pp. 225-277). Cambridge: Cambridge University Press.
- Glimore, G. C., Hersch, H., Caramazza, A., & Griffin, J. (1979). Multidimensional letter similarity derived from recognition errors. *Pereception and Psychophysics*, 25, 425-431.
- Gluck, M. A., & Bower, G. H. (1990). Component and pattern information in adaptive networks. *Journal of experimental psychology:general*, 119, 105-109.
- Goldstone, R., & Medin, D. L. (1994). The time course of comparison. *Journal of experimental psychology:learning, memory and cognition*, 20, 29-50.
- Goldstone, R., Medin, D. L., & Gentner, D. (1991). Relational similarity and the nonindependence of features in similarity judgements. *Cognitive Psychology*, 222-263.
- Goldstone, R., & Son, J. (2005). Similarity. In K. Holyoak & R. Morrison (Eds.), *The cambridge handbook of reasoning and thinking* (pp. 13-36). Cambridge: Cambridge university press.
- Goodman, N. (1972). Seven strictures on similarity. In N. Goodman (Ed.), *Problems and projects* (pp. 437-446). New York: The Bobbs-Merrill co.
- Gottman, J., Murray, J., Swanson, C., Tyson, R., & Swanson, K. (2003). *The mathematics of marriage*: MIT Press.
- Grigorenko, E. L. (2002). In search of the genetic engram of personality. In D. Cervone & W. Mischel (Eds.), *Advances in personality science* (pp. 29-82). New York: Guildford Press.
- Guttman, L. (1954). A new approach to factor analysis: the radex. In P. Lazarsfeld (Ed.), *Mathematical thinking in the behavioral sciences* (pp. 258-348). New York: New York Free Press.
- Hahn, U., & Chater, N. (1998). Understanding similarity: A joint project for psychology, case-based reasoning and law. *Artificial intelligence review*, 12, 393-427.
- Hahn, U., Chater, N., & Richardson, L. (2003). Similarity as Transformation. *Cognition*, 87, 1-32.
- Harre, R. (1998). *The singular self: An introduction to the psychology of personhood*. London: Sage.
- Heit, E., & Rubenstein, J. (1994). Similarity and property effects in productive reasoning. *Journal of experimental psychology:learning, memory and cognition*, 20, 411-422.
- Hubel, D. H., & Wiesel, T. (1968). Receptive fields and functional architecture of monkey striate cortex. *Journal of Physiology*, 195, 215-243.
- Hunter, M. G. (1994). Excellent systems analysts - key audience perceptions. *Computer Personnel*, 15-31.
- Jakobson, R., Fant, G., & Halle, M. (1963). *Preliminaries to speech analysis: The distinctive features and their correlates*. Cambridge, MA: MIT Press.
- Kagan, J. (1994). *Galen's prophecy: Temperament in human nature*. New York: Basic books.
- Kagan, J. (1999). Born to be shy? In R. Conlan (Ed.), *States of mind* (pp. 29-51). New York: Wiley.
- Katz, J. J., & Fodor, J. (1963). The structure of semantic theory. *Language*, 39, 170-210.
- Keil, F. C. (1989). *Concepts, kinds and development*. Cambridge MA: MIT Press.
- Kohonen, T. (1995). *Self-organising maps*. Berlin: Springer-Verlag.
- Krumhansl, C. L. (1978). Concerning the applicability of geometric models to similarity data: The interrelationship between similarity and spatial density. *Psychological review*, 85, 450-463.
- Krumhansl, C. L. (1988). Testing the density hypothesis: Comment on Corter. *Journal of experimental psychology:general*, 117, 101-104.
- Krushke, J. K. (1992). ALCOVE: an exemplar-based connectionist model of category learning. *Psychological review*, 99, 22-44.
- Kruskal, J. B. (1964a). Multidimensional scaling by optimizing goodness of fit to a nonmetric hypothesis. *Psychometrika*, 29, 1-27.
- Kruskal, J. B. (1964b). Nonmetric multidimensional scaling: a numerical method. *Psychometrika*, 29, 115-129.
- Labuschagne, A. (2003). Qualitative research - airy-fairy or fundamental. *The qualitative report*, 8(1).
- Lamberts, K. (2000). Information accumulation theory of speeded-categorisation. *Psychological review*, 107, 227-260.
- Li, M., & Vitanyi, P. (1997). *An introduction to Kolmogorov complexity and its applications* (2 ed.). New York: Springer-Verlag.
- Lombardo, M., & Eichinger, V. (2000). High potentials as high learners. *Human Resource Management*, 39(4), 321-329.
- Maki, P. (2004). Assessing for learning: building a sustainable commitment across the institution. In (pp. 85-118). Sterling VA: Stylus Publishing.
- Markham, A. B., & Gentner, D. (1993a). Splitting the differences: A structural alignment view of similarity. *Journal of memory and language*, 32, 517-535.
- Markham, A. B., & Gentner, D. (1993b). Structural alignment during similarity comparisons. *Cognitive Psychology*, 25, 431-437.
- Medin, D. L., & Schaeffer, M. M. (1978). A context theory of classification learning. *Psychological review*, 85, 207-238.
- Milojevic, I. (1998). Women's higher education in the 21st century. *Futures journal*, 30(7), 693-703.
- Moore, J. E., & Burke, L. A. (2002). How to turnaround turnover culture in IT. *Communications of the ACM*, 45(2), 73-78.
- Murphy, G. L. (2002). *The big book of concepts*. Cambridge MA: MIT press.
- Murphy, G. L., & Medin, D. L. (1985). The role of theories in conceptual coherence. *Psychological review*, 92, 289-316.
- Naur, P. (1993). Understanding Turing's universal machine: personal style in program description. *The Computer Journal*, 36(4), 351-372.
- Neisser, U. (1967). *Cognitive Psychology*. New York: Appleton-Century-Crofts.
- Nickerson, R. S. (1986). Binary classification reaction time: A review of some studies of human information processing capabilities. *Psychonomic monograph supplements*, 4(6), 275-317.
- Nosofsky, R. M. (1986). Attention, similarity and the identification-categorisation relationship. *Journal of experimental psychology:general*, 115, 39-57.
- Nosofsky, R. M. (1991). Stimulus bias, asymmetric similarity and classification. *Cognitive Psychology*, 23, 93-140.
- NZMoE. (2004). *Statement of tertiary education priorities 2005 - 2007 discussion document*.
- Pervin, L. A., Cervone, D., & John, O. P. (2005). *Personality theory and research*: Wiley.
- Plomin, R., & Caspi, A. (1998). DNA and personality. *European Journal of personality*, 12, 387-487.
- Plomin, R., & Caspi, A. (1999). Behavioural genetics and personality. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (pp. 251-276). New York: Guildford.
- Podgorny, P., & Garner, W. R. (1979). Reaction time as an indicator of inter-intra-object visual similarity: Letters of the alphabet. *Pereception and Psychophysics*, 26, 37-52.
- Polkinghorne, D. (1988). *Narrative knowing and the human sciences*. Albany, NY: State University of New York Press.
- Quine, W. V. (1969). *Ontological relativity and other essays*. New York: Columbia university press.
- Quine, W. V. (1977). Natural kinds. In S. P. Schwartz (Ed.), *Naming, necessity and natural kinds* (pp. 155-175). Ithaca New York: Cornell university press.
- Richardson, M. W. (1938). Multi-dimensional psychophysics. *Psychological bulletin*, 35, 659-660.
- Ripley, B. D. (1996). *Pattern recognition and neural networks*. Cambridge: Cambridge university press.
- Rips, L. J. (1989). Similarity, typicality and categorisation. In S. Vosniadu & A. Ortony (Eds.), *Similarity, analogy and thought* (pp. 21-59). Cambridge: Cambridge university press.
- Rips, L. J., & Collins, A. (1993). Categories and resemblance. *Journal of experimental psychology:general*, 122, 468-486.
- Ross, B. H. (1987). This is like that: the use of earlier problems and the separation of similarity effects. *Journal of experimental psychology: Learning, memory and cognition*, 13, 629-639.
- Ross, B. H. (1989). Distinguishing types of superficial similarities: Different effects on the access and use of earlier problems. *Journal of experimental psychology:learning, memory and cognition*, 15, 456-468.
- Rowe, D. C. (1999). Personality: contemporary theory and research. In V. J. Derlega, B. A. Winstead & W. H. Jones (Eds.), *Heridity* (pp. 66-100). Chicago: Nelson Hall.
- Ryan, A. M., & Tippins, N. T. (2004). Attracting and Selecting: What psychological research tells us. *Human resource management*, 43(4), 305-318.
- Rynes, S. L., Colbert, A. E., & Brown, K. G. (2002). HR professionals' beliefs about effective human resource practices: Correspondence between research and practice. *Human resource management*, 41, 149-174.
- Saxe, L., & Ben-Shakhar, G. (1999). Admissibility of polygraph tests: The application of scientific standards post-Daubert. *Psychology, Public Policy and the Law*, 5(1), 203-223.

- Schank, R. C. (1982). *Dynamic theory: A theory of reminding and learning in computers and people*. Cambridge MA: Cambridge university press.
- Schmidt, F. L., & Hunter, J. E. (1988). The validity and utility of selection methods in personnel psychology: practical and theoretical implications of 85 years of research findings. *Psychological bulletin*, 124, 262-274.
- Schmidt, L. A., & Fox, N. A. (2002). Individual differences in childhood shyness. Origins, malleability and developmental course. In D. Cervone & W. Mischel (Eds.), *Advances in personality science* (pp. 83-105). New York: Guilford press.
- Segrave, S. (2003, December 7 - 10). *Bench marking design of simulated professional practice for authentic learner engagement*. Paper presented at the Annual conference of the Australasian society for computers i learning in tertiary education (ASCILITE), Adelaide, Australia.
- Shepard, R. N. (1962a). The analysis of proximities: multidimensional scaling with an unknown distance function Part 2. *Psychometrika*, 27, 219-246.
- Shepard, R. N. (1962b). The analysis of proximities: Multidimensional scaling with an unknown distance function Part 1. *Psychometrika*, 27, 125-140.
- Sjoberg, L. (1972). A cognitive theory of similarity. *Goteborg Psychological Reports*, 2(10).
- Stewart, J., & Knowles, V. (2000). Graduate recruitment and selection practices in small businesses. *career development international*, 5(1), 21-38.
- Stobart, S., & Gipps, C. (1997). *Assessment - a teacher's guide to the issues*: Hodder and Stoughton.
- Strelau, J. (1998). *Temperament: A Psychological perspective*. New York: Plenum Press.
- Tan, F., & Hunter, M. G. (2000). *Cognitive research in information systems using the repertory grid technique*. Unpublished manuscript.
- Tarr, M. J., & Gauthier, I. (1998). Do view-point-dependant mechanism generalise across members of a class? *Cognition*, 67, 73-110.
- Taylor, M. S., & Collins, C. J. (2000). Organisational recruitment: Enhancing the intersections of research and practice. In C. L. Cooper & E. A. Locke (Eds.), *Industrial and organisational psychology: linking theory with practice* (pp. 304-330). Oxford UK: Blackwell.
- Taylor, S. E. (1989). *Positive illusions: Creative self-deception and the healthy mind*. New York: Basic Books.
- Tenenbaum, J. B. (1999). *Bayesian modeling of human concept learning* (Vol. 11). Cambridge: MIT Press.
- Torgerson, W. S. (1958). *Theory and methods of scaling*. New York: Wiley.
- Truex, D., Baskerville, R., & Travis, J. (2000). Amethodical systems development: the deferred meaning of systems development methods. *Accounting Management and Information Technology*, 10, 53-79.
- Truex, D., Travis, J., & Baskerville, R. (1992). Systems without method: the impact of new technologies on information systems development projects. In K. Kendal, K. Lyytinen & J. DeGross (Eds.), *Transaction on the impact of computer supported technologies in informatuion systems development* (pp. 241-260). Amsterdam: Elsavier.
- Tversky, A. (1977). Features of similarity. *Psychological review*, 84, 327-352.
- Tversky, A., & Gati, I. (1982). Similarity, separability and the triangle inequality. *Psychological review*, 89, 123-154.
- Tversky, A., & Hutchinson, J. W. (1986). Nearest neighbour analysis of psychological spaces. *Psychological review*, 93, 3-22.
- Upward-Motion. (2006a). *Real Estate Simulator*. Retrieved 10/02/06, 2006, from <http://www.realestatesimulator.com/index.asp>
- Upward-Motion. (2006b). *Sales Simulator*. Retrieved 10/02/06, 2006, from <http://www.salessimulator.com/b2bsales/index.asp>
- Wolfe, T. (1979). *The Right Stuff*: Farrar, Straus and Giroux.
- Young, G., & Householder, A. S. (1941). A note on multidimensional psychophysical analysis. *Psychometrika*, 6, 331-333.
- Yourdon, E. (1993). *The decline and fall of the american programmer*. New Jersey: Prentice Hall Englewood Cliffs.
- Zhang, S., & Markham, A. B. (1998). Overcoming the early entrant advantage: The role of alignable and non-alignable differences. *Journal of marketing research*, 35, 413-426.

# Requirements Engineering Framework for Information Utility Infrastructure for Rural e-Healthcare Service Provisioning

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## ABSTRACT

*The accessibility to important healthcare resources and the costs of healthcare services are serious challenges facing the rural communities of most developing countries. In order to address these problems, we are pursuing rigorous experimental investigations for the development of an information utility infrastructure, which takes advantages of emerging Utility Grid Computing (UGC) and Body Area Network (BAN) for ubiquitous e-Healthcare service provisioning. In this paper, we derive the system requirements from enterprise models and delineate the general framework guiding the development of the infrastructure.*

**Keywords:** Healthcare Management, Body Area Network, Grid Computing, Enterprise Model

## 1. INTRODUCTION

Most rural communities in developing countries are facing debilitating situations regarding accessibility to quality healthcare services. There is high demand for increased accessibility to important healthcare resources, increased efficiency and quality-oriented healthcare services with limited financial resources. Rural communities are characterized by prevailing issues such as low health level, low literacy level, limited resources and professional isolation.

In a modern information society, patient care increasingly requires healthcare practitioners to access accurate and complete health information so as to effectively manage the safe and efficient delivery of complex and knowledge intensive healthcare. There is also the need to share this information within and between care teams. On the other hand, patients require access to their own health information in

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