Association for Information Systems
AIS Electronic Library (AISeL)

All Sprouts Content | Sprouts

12-7-2010

Cybernetics and the Agility Question

George Hobbs
University of Melbourne, georgehobbs@gmail.com

Rens Scheepers
University of Melbourne, r.scheepers@unimelb.edu.au

Follow this and additional works at: http://aisel.aisnet.org/sprouts_all

Recommended Citation
Hobbs, George and Scheepers, Rens, " Cybernetics and the Agility Question" (2010). *All Sprouts Content*. 406.
http://aisel.aisnet.org/sprouts_all/406

This material is brought to you by the Sprouts at AIS Electronic Library (AISeL). It has been accepted for inclusion in All Sprouts Content by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

芽|Sprouts Working Papers on Information Systems ISSN 1535-6078

Cybernetics and the Agility Question

George Hobbs
University of Melbourne, Australia

Rens Scheepers
University of Melbourne, Australia

Abstract
The ability to sense and respond effectively to fluctuations in an environment is the fundamental problem addressed by cybernetics. When applied to the context of the organizational IT function, agility denotes the capacity of the IT function to perceive "signals" from its internal and external environments, to interpret these, and respond appropriately. The processing of such signals requires the selection and filtering of information to drive decision-making for response in a timely way. The challenge for the IT function is processing an overwhelming collection of signals, in un-standardized formats, and from overlapping sources, that tends to overload decision-makers. Informed by a cybernetic model, we studied how the IT function enables agility. We found evidence (1) that the more mature the policy processes of the IT function, the more the IT function will create agility in information systems; (2) The more mature the intelligence processes of the IT function to look outside the organization, the more the IT function will create agility in information systems and; (3) The more mature the control processes of the IT function that focus on the current use of information systems, the more the IT function will create agility in information systems.

Keywords: Cybernetics, Agility, IT Function

Permanent URL: http://sprouts.aisnet.org/10-114

Copyright: Creative Commons Attribution-Noncommercial-No Derivative Works License

Reference: Hobbs, G.A., Scheepers, R. (2010). "Cybernetics and the Agility Question," Proceedings > Proceedings of IFIP 8.2/Organizations and Society in Information Systems (OASIS) . *Sprouts: Working Papers on Information Systems*, 10(114). http://sprouts.aisnet.org/10-114

芽|Sprouts

Cybernetics and the Agility question

George Hobbs and Rens Scheepers*
Department of Information Systems
The University of Melbourne
Victoria, Australia
{ georgehobbs@gmail.com, r.scheepers@unimelb.edu.au *contact author}

Keywords: Cybernetics, Agility, IT Function

The ability to sense and respond effectively to fluctuations in an environment (Overby et al., 2006) is the fundamental problem addressed by cybernetics (Ashby, 1956, Beer, 1984). When applied to the context of the organizational IT function, agility denotes the capacity of the IT function to perceive "signals" from its internal and external environments, to interpret these, and respond appropriately. The processing of such signals requires the selection and filtering of information to drive decision-making for response in a timely way. The challenge for the IT function is processing an overwhelming collection of signals, in un-standardized formats, and from overlapping sources, that tends to overload decision-makers (Seo and La Paz, 2008). From an agility perspective, this signal overload problem (typical of complex IT environments), must be dealt with effectively. Cybernetic theory, in particular the law of requisite variety (Ashby, 1956, Conant and Ashby, 1970), offers some insights in this regard. The law of requisite variety recognizes that the external environment inherently contains more variety than the IT function can absorb and therefore demands approaches and procedures to attenuate environmental variety to what is requisite to manage the function effectively. Second, cybernetic theory acknowledges that the controller of a system cannot know all the details of the system's internal processes and must have this internal variety attenuated as well to manage the system effectively. Therefore, theoretical perspectives on agility of the IT function imply a requisite knowledge base to manage and deal with signal complexity from the environment and internal processes to respond effectively, e.g. through adaptations of existing IT and work processes (Desouza, 2006).

#|Sprouts

We contend that cybernetics offers a useful grand theory (Gregor, 2006) to adapt and inform agility of the IT function. For example, technology forecasting, scenario planning, etc., can be understood as necessary activities of an IT function to anticipate environmental fluctuations; similarly, internally focused interventions, such as monitoring and promoting effective use of systems (Desouza, 2006, Galliers, 2006, Peppard and Ward, 2004) also have an underpinning cybernetic rationale. From an industry perspective, the COBIT framework can also be understood through the cybernetic lens. In COBIT, "Control is defined as the policies, procedures, practices and organizational structures designed to provide reasonable assurance that business objectives will be achieved and undesired events will be prevented or detected and corrected" (IT Governance Institute, 2007 p. 13).

Informed by a cybernetic model (Beer 1984), we studied how the IT function enables agility (Hobbs 2010). We found evidence (1) that the more mature the policy processes of the IT function, the more the IT function will create agility in information systems; (2) The more mature the intelligence processes of the IT function to look outside the organization, the more the IT function will create agility in information systems and; (3) The more mature the control processes of the IT function that focus on the current use of information systems, the more the IT function will create agility in information systems.

References

Ashby, W. R. (1956) *An Introduction to Cybernetics*. London: Chapman & Hall.

Beer, S. (1984) "The Viable System Model: Its Provenance, Development, Methodology and Pathology," *The Journal of the Operational Research Society* (35) 1, pp. 7-25.

Conant, R. C. and W. R. Ashby (1970) "Every good regulator of a system must be a model of that system," *International Journal of Systems Science* (1) 2, pp. 89-97.

Desouza, K. C. (2006) *Agile Information Systems: Conceptualization, Construction, and Management*. Oxford: Butterworth Heinemann.

(cc) BY-NC-ND

Galliers, R. D. (2006) Strategizing for Agility: Confronting Information Systems Inflexibility, in K. C. Desouza (Ed.) *Agile Information Systems: Conceptualization, Construction, and Management*, Oxford: Butterworth Heinemann.

Gregor, S. (2006) "The nature of theory in information systems," *MIS Quarterly* (30) 3, pp. 611-642.

Hobbs, G. A. (2010) *Enabling agility in existing information systems: A capability structure for the IT function*. PhD thesis, The University of Melbourne, http://repository.unimelb.edu.au/10187/8550

IT Governance Institute. (2007) *COBIT 4.1: Framework, Control Objectives, Management Guidelines, Maturity Models*. IT Governance Institute.

Overby, E., A. Bharadwaj, and V. Sambamurthy (2006) "Enterprise agility and the enabling role of information technology," *European Journal of Information Systems* (15) 2, pp. 120-131.

Peppard, J. and J. Ward (2004) "Beyond strategic information systems: towards an IS capability," *Journal of Strategic Information Systems* (13) 2, pp. 167-194.

Seo, D. B. and A. I. La Paz (2008) "Exploring the dark side of IS in achieving organizational agility," *Communications of the ACM* (51) 11, pp. 136-139.

#|Sprouts

芽|Sprouts

Working Papers on Information Systems | ISSN 1535-6078

Editors:
Michel Avital, University of Amsterdam
Kevin Crowston, Syracuse University

Advisory Board:
Kalle Lyytinen, Case Western Reserve University
Roger Clarke, Australian National University
Sue Conger, University of Dallas
Marco De Marco, Universita' Cattolica di Milano
Guy Fitzgerald, Brunel University
Rudy Hirschheim, Louisiana State University
Blake Ives, University of Houston
Sirkka Jarvenpaa, University of Texas at Austin
John King, University of Michigan
Rik Maes, University of Amsterdam
Dan Robey, Georgia State University
Frantz Rowe, University of Nantes
Detmar Straub, Georgia State University
Richard T. Watson, University of Georgia
Ron Weber, Monash University
Kwok Kee Wei, City University of Hong Kong

Sponsors:
Association for Information Systems (AIS)
AIM
itAIS
Addis Ababa University, Ethiopia
American University, USA
Case Western Reserve University, USA
City University of Hong Kong, China
Copenhagen Business School, Denmark
Hanken School of Economics, Finland
Helsinki School of Economics, Finland
Indiana University, USA
Katholieke Universiteit Leuven, Belgium
Lancaster University, UK
Leeds Metropolitan University, UK
National University of Ireland Galway, Ireland
New York University, USA
Pennsylvania State University, USA
Pepperdine University, USA
Syracuse University, USA
University of Amsterdam, Netherlands
University of Dallas, USA
University of Georgia, USA
University of Groningen, Netherlands
University of Limerick, Ireland
University of Oslo, Norway
University of San Francisco, USA
University of Washington, USA
Victoria University of Wellington, New Zealand
Viktoria Institute, Sweden

Editorial Board:
Margunn Aanestad, University of Oslo
Steven Alter, University of San Francisco
Egon Berghout, University of Groningen
Bo-Christer Bjork, Hanken School of Economics
Tony Bryant, Leeds Metropolitan University
Erran Carmel, American University
Kieran Conboy, National U. of Ireland Galway
Jan Damsgaard, Copenhagen Business School
Robert Davison, City University of Hong Kong
Guido Dedene, Katholieke Universiteit Leuven
Alan Dennis, Indiana University
Brian Fitzgerald, University of Limerick
Ole Hanseth, University of Oslo
Ola Henfridsson, Viktoria Institute
Sid Huff, Victoria University of Wellington
Ard Huizing, University of Amsterdam
Lucas Introna, Lancaster University
Panos Ipeirotis, New York University
Robert Mason, University of Washington
John Mooney, Pepperdine University
Steve Sawyer, Pennsylvania State University
Virpi Tuunainen, Helsinki School of Economics
Francesco Virili, Universita' degli Studi di Cassino

Managing Editor:
Bas Smit, University of Amsterdam

Office:
Sprouts
University of Amsterdam
Roetersstraat 11, Room E 2.74
1018 WB Amsterdam, Netherlands
Email: admin@sprouts.aisnet.org

芽|Sprouts