From anticipation to anticipatory awareness

Dr. Dave Snowden

Founder & Chief Scientific Officer

Cognitive Edge Pte Ltd

Abstract:

This research seminar will report on the theoretical basis, and application of a part of the Singapore Government's Risk Assessment and Horizon Scanning (RAHS) system. This in turn built on US Government DARPA funding in the general field of anti-terrorism, weak signal detection and issues relating to cognitive bias.

The theoretical basis underlying the approach uses the application of the science of complex adaptive systems to social systems and the understanding from the cognitive sciences about the pattern, and fragmented basis of human decision making.

When? **Monday, February 4, 2008,** 17.00 – 18.30 h
Where? ETH Zürich**, ZUE, Auditorium G-Floor** (Zürichbergstrasse 18)

(Extended abstract see next 3 pages)

This research seminar will report on the theoretical basis, and application of a part of the Singapore Government's Risk Assessment and Horizon Scanning (RAHS) system. This in turn built on US Government DARPA funding in the general field of anti-terrorism, weak signal detection and issues relating to cognitive bias.

The theoretical basis underlying the approach is termed naturalising sense-making. This builds on both the general tradition of sense-making (Weick, Dervin, Klein) but also the naturalising tradition within philosophy, which seeks to root that discipline in the natural sciences. Specifically this means:

- The application of the science of complex adaptive systems to social systems. Such systems are inherently unpredictable in outcome, but at the same time are retrospectively coherent, with the benefit of hindsight it is possible to see a chain of cause and effect relationships, but it is not possible use that understanding to predict the future. However there are tangible aspects of a complex system which allow us to gain insight and influence its evolution.

- Understanding from the cognitive sciences about the pattern, and fragmented basis of human decision making. This supports experimental work by Klein and others which demonstrated that decisions in the field were based on a first (not a best) fit pattern match with previous or hypothecated future experience. This together with general work on cognitive bias has major implications for issues such as weak signal detection, and understanding of "alien" issues. Work in this area has also demonstrated that there are natural limits to semantic analysis.

Based on this theory, coupled with insight from knowledge management, in particular the role of narrative in knowledge transfer and cross cultural understanding, the RAHS system provides a range of methods and software which provides a different approach to what is known as pre-hypothesis research and anticipatory awareness. This will be described in the seminar and includes the following:

- The design of large volume databases of fragmented material designed utilising an indexing structure which is a half way house between social computing and more traditional and hierarchical taxonomies. Current experience in a range of government and industrial projects indicates that this provides a quantitative approach in areas traditionally covered by qualitative techniques and creates high quality output for statistical techniques and analysis.

- The use of fitness landscapes to represent complex issues relating to abstract factors such as motivation, belief systems etc. In experimental deployment which allows multiple cultural perspectives of a situation to be represented as landscapes, with a capacity to go from abstract representation to original source data without the disinter-mediation of analysis and interpretation.

- The use of narrative defined models to provide early warning of potential phase shifts in the nature of social interactions in large populations, coupled with appropriate early warning alerts. This approach also provides an alternative to key word and other boolean search mechanisms on large volume datasets.

The above is not a complete list of the approach, or of the material to be covered in the seminar, but it is indicative.

References

Kurtz, C & Snowden, D (2003) “The New Dynamics of Strategy: sense making in a complex-complicated world” in *IBM Systems Journal”* Volume 42 Number 3 pp 462-483

Snowden, D (2005) “Multi-ontology sense making – a new simplicity in decision making” in *Informatics in Primary Health Care* 2005:13:00-00 (updated version)

Lazaroff, M & Snowden, D “Anticipatory modes for Counter Terrorism” in Popp, R & Yen, J *Emergent Information Technologies and Enabling Policies for Counter-Terrorism* Wiley-IEEE Press 2006

Kurtz, C & Snowden D “Brambles in a Thicket” in Gibbert, Michel, Durand & Thomas *Strategic Networks: Learning to Compete* Blackwell