Making the invisible visible: a theory of security culture for secure and usable grids.

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Making the invisible visible

A theory of security culture for secure and usable grids

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Introduction

Why Security Culture

- Values conflict.
- Existing understanding based on inappropriate contexts.
- Tools are value-free and not contextualised.

Method

1. Grounded Theory [Corbin and Strauss, 2008] analysis from existing literature.
2. Comparative model derived from empirical data.
3. Theoretical and empirical models applied to a secure design process.

Case Studies

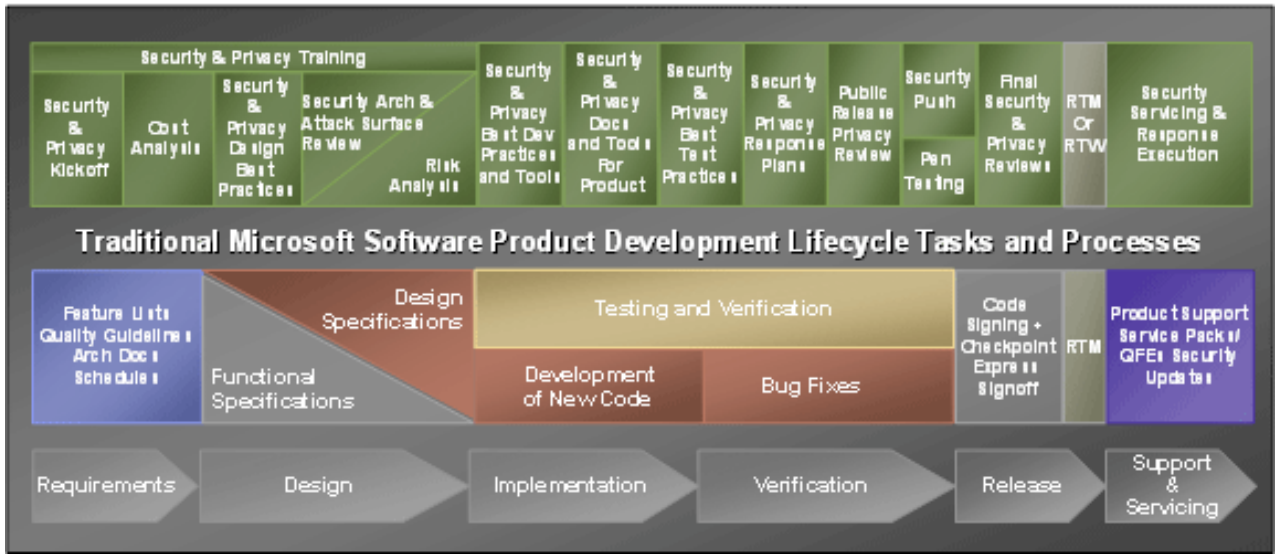
NeuroGrid

- A grid based collaborative research environment [Geddes et al, 2006].
- 3 clinical exemplars : Stroke, Dementia and Psychosis.
- Data both sensitive and distributed.

Case Studies

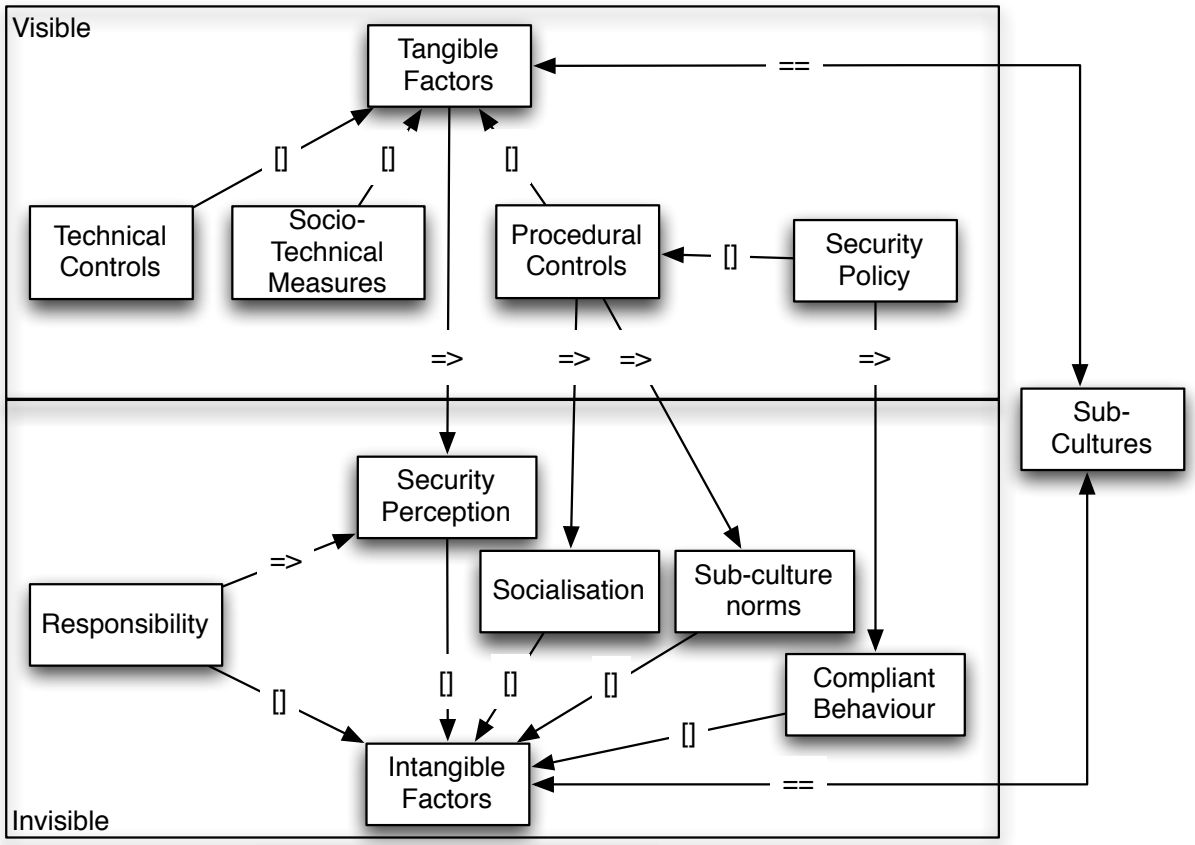
Security Development Lifecycle

- A software development process for developing secure software [Howard and Lipner, 2006, Microsoft Corporation, 2008].
- Pragmatic : based on Microsoft's experience securing Windows 2000, .NET and Windows Server 2003.
- Prescriptive: guidance for all stages of the secure software development lifecycle.



What is Security Culture?

A combination of *tangible* and *intangible* factors within both an organisation's culture and its subcultures.

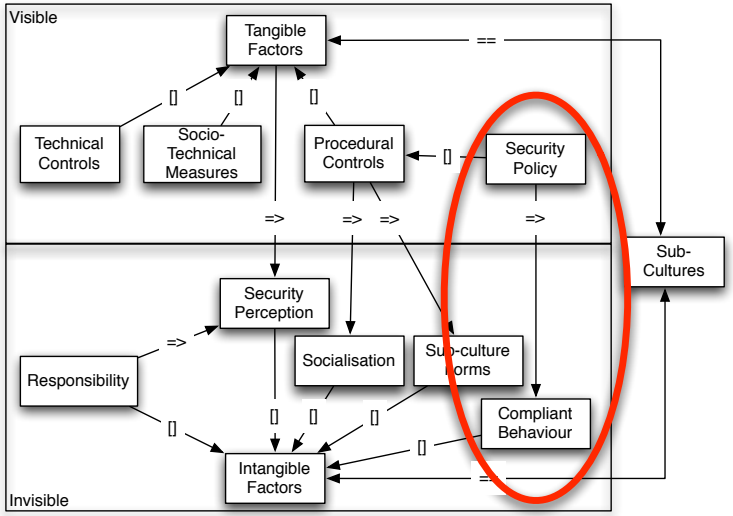


Label	Relation
==	C is-associated-with C2
[]	C1 is-part-of C2
=>	C1 is-cause-of C2

Guideline 1

Have a single, visible, security policy

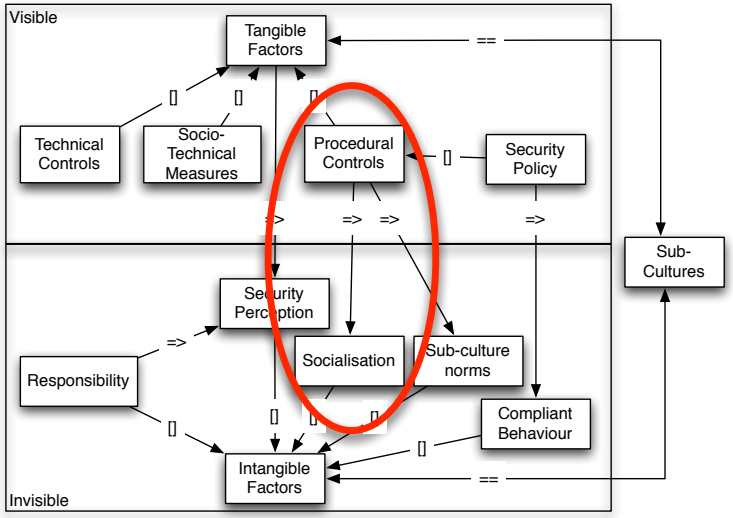
- Statements of management intent.
- Multiple forms of procedural control lead to multiple security perspectives.
- Reliance on social networks in lieu of visible policies.



Guideline 2

Leverage socialisation

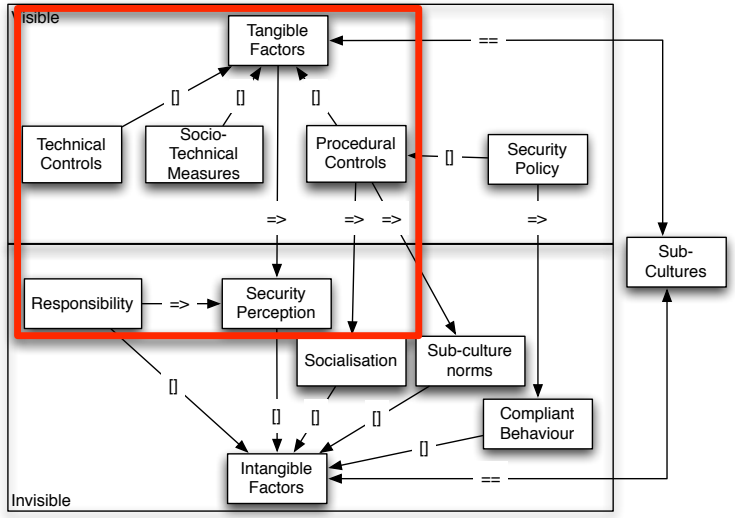
- *Socialisation* is the process of developing culturally acceptable beliefs, values and behaviours [Brown, 1998].
- Certificate installation as a rite of passage.
- Compliance and socialisation synonymous in the SDL.



Guideline 3

Model lines of responsibility

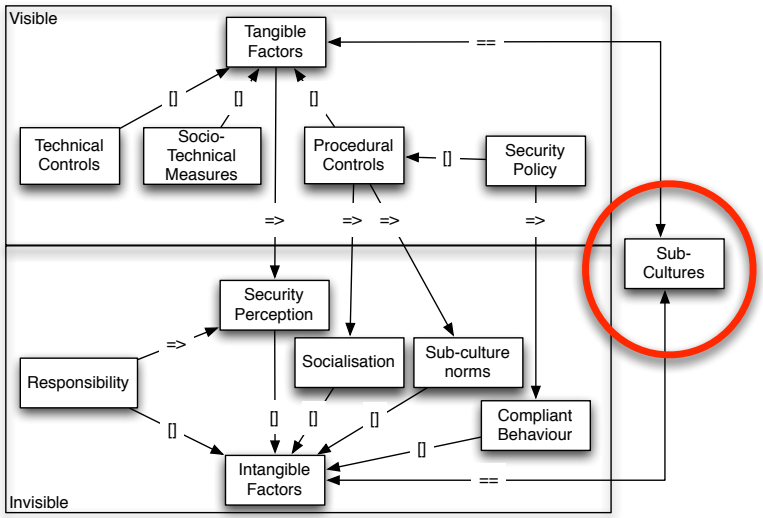
- Literature : organisational and moral responsibility.
- NeuroGrid : various and split between technical controls and assets.
- Ambiguity identified by modelling lines of responsibility before implementing a security policy.



Guideline 4

Know your subcultures

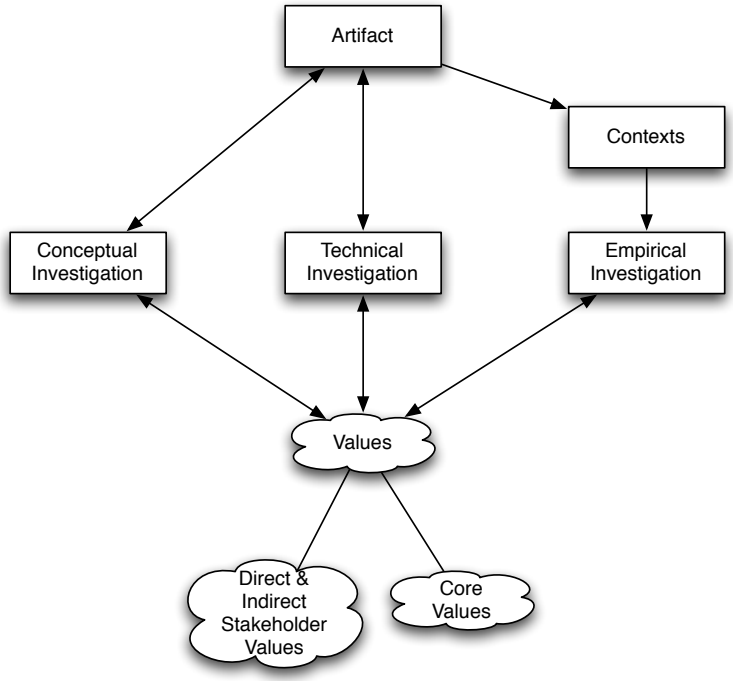
- Evident in NeuroGrid when asking users to describe how data was handled.
- Diffusion of Responsibility [Darley and Latané, 1970].
- Understanding values helps to determine whether security will be sacrificed for operational goals.



Future work

Value Sensitive Design and the design process

- Identifies *impacting human values* and integrates them into the design process.
- Conceptual, Empirical and Technical Investigation.
- Supplements existing design processes.
- Precedents in secure and usable design [Friedman et al., 2002, Friedman et al., 2005, Friedman et al., 2006]



Future work

Augmenting Value Sensitive Design

- Conceptual Investigation.
  - Augment with additional values.
- Empirical Investigation.
  - Responsibility modelling.
- Technical Investigation.
  - Implications of augmenting the approach.

Guideline	Value
Have a single, visible security policy	Compliant Behaviour
Leverage socialisation	Socialisation
Model lines of responsibility	Responsibility
Understand your subcultures	Sub-culture norms

Summary

Contributions

- Security Culture : what is it and why do we need it.
- Guidelines for a healthy security culture.
- An agenda for incorporating insights into the secure design process.

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