How to understand, specify and describe the security function of a product: Towards a language and a framework for designing against crime

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Origins: the need for a language

- Project Marc – crime-proofing of portable electronic products – concern with precision terminology in project design – *What do you mean, is it secure?*
- Judging student Design Against Crime competitions – rationale of designs poorly articulated
- Teaching/studio design work – MA Industrial Design – rationale, student difficulties with crime science
- Participation in real product/environmental design projects – Bikeoff (secure bike parking designs and standards) and Grippa.(anti-bag-theft table clips in bars) – this highlighted:
  - How designs appear simple but in fact are high-performance
  - Importance of capturing design knowledge for transfer
  - Strategic concept of ***building innovative capacity***

Building innovative capacity – why?

- All crime prevention interventions are highly context-dependent – replication of what works in new contexts is more like innovation
- DAC must cope with Heraclitean world – adaptive offenders, social and technological change
- Boosting the innovative capacity of designers helps them extend their coverage to new contexts and keep up in the arms race
- While designers have plenty of generic innovative capacity, they are limited on crime side
  - Wrong mindset
  - Little capacity to think abuser rather than think user
  - Lack theory and frameworks to articulate and transfer knowledge

Designers can do if prompted: The No ClimBIN - Jenny Loqvist Griffith University Australia 2008

Competition organisers

Design Out Crime Research Group
Curtin University Australia
www.designoutcrime.org

Building innovative capacity – how?

- Basic task is to supply knowledge of what works in crime prevention
- *Cropley* – but in a way that simultaneously *enables creativity* as well as *constrains designers to reality*
- *Eck* - theory - 'what works is situational crime prevention'
- *Tilley* – Scientific Realist mechanisms
- *Ekblom* – generative principles as well as practical methods, and articulation of the tacit, are needed in reflective practice and knowledge transfer
- 'Sense-making' – ideas must connect to processes and concepts *designers* understand, including both the purpose and the actual, technical realisation of the product

Security Function Framework

- Purpose

What crime problem/s does the design address?

- Niche

How does the product fit within the ecology of security?

- Mechanism

How does the product work in preventing crime?

- Technology

How is the product realised so as to support the preventive mechanisms and address all other purposes?

Security Function Framework

Purpose

What **crime problem/s** does the design address?

- Risk reduction (prevention)
  - Possibility
  - Probability
  - Harm – immediate and knock-on (including crime proliferation)
- Harm mitigation

Purpose: What kind of crime risk?
Misdeeds & Security framework

Mistreatment (damage)

Misappropriation (theft)

Mishandling (e.g. fraud)

Target of crime

Misuse (e.g. as tool)

Misbehaviour (nuisance, conflict)

Contributor to crime

Mistake (false alarm)

Downside of prevention

Security Function Framework

Purpose

More general purpose – importance of avoiding 'vulnerability led' designs, addressing 'multiple drivers' and being user-friendly/abuser-unfriendly

- *Principal* purpose – what product is for

- *Subsidiary* purpose/s – what *other* requirements are made of the product
  - *Desire*
    - e.g. economy, aesthetics, reliability, user-friendliness – for various stakeholders
  - *Hygiene*
    - e.g. safety, sustainability, inclusiveness

Security Function Framework

Niche

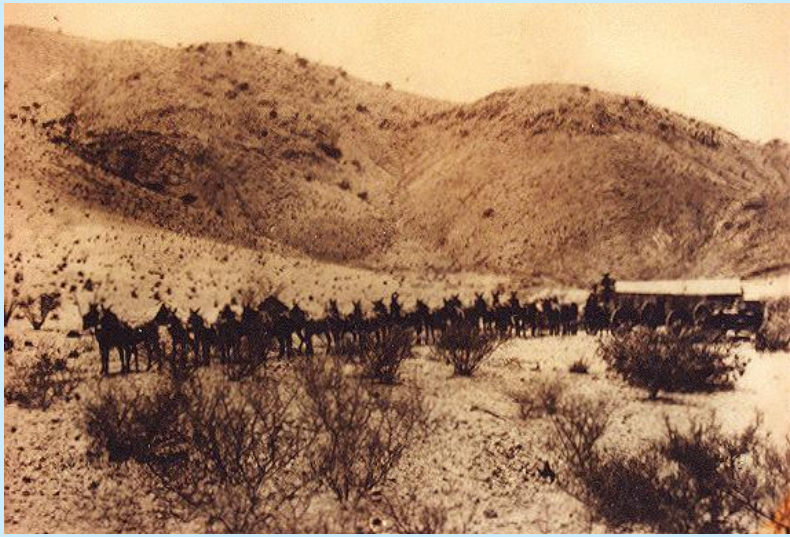
How does the product fit within the ecology of security?

- *Safe* product – not exposed to risk
  - Inherently undesirable to offender
  - In fully secure physical/social environment

Security Function Framework

Niche

How does the product fit within the ecology of security?



- *Secure* product – own properties protect it
  - Intrinsic – e.g. bulk, weight
  - Security adaptations

Security Function Framework

Niche

How does the product fit within the ecology of security?

- *Security* product – principal purpose to protect something/ someone else – e.g. ink tag

Security Function Framework

Niche

How does the product fit within the ecology of security?

- Security *component* – e.g. anti-counterfeit label

Security Function Framework

Niche

How does the product fit within the ecology of security?

- *Securing* product – *principal* purpose is non-crime-related; but *subsidiary* purpose is
  - e.g. Stop Thief Chair, CaMden bike stand…

Security Function Framework

Niche

How does the product fit within the ecology of security?

- Security *communication* – to mobilise some person or organisation to act as preventer/ stop acting as crime promoter

Security Function Framework

Niche

How does the product fit within the ecology of security?

- Secure *environment* – e.g. enclosure, guards…

Security Function Framework

Niche

How does the product fit within the ecology of security?

- *Security* or *securing* product/environment

  – In function – protecting some product, place or person

  – As object – itself at risk of some misdeed – misappropriation, mistreatment, misbehaviour

  – These misdeeds could be
    - Incidental – e.g. theft for scrap, damage for fun
    - Criminal countermove – defeat security function
    - In either case could disable security function

Security Function Framework

- Mechanism
- Causes and interve

How does the product work in preventing crime?

  - Which properties/features of the product *increase* crime risk? Which *decrease* it?
    - e.g. **CRAVED**
  - How do properties have effect in interaction with physical/social environment? e.g.:
    - Anchor bike to ground
    - Block entry of people lacking authorisation
    - Alert place managers
    - Disrupt criminal scripts
    - Tip balance in script clash between user and abuser

Security Function Framework

Mechanism

How does the product work in preventing crime?

- Substantive – physical blocking

- Perceptual influence – anticipation of risk, effort, low reward

and

- Direct
- Indirect – require actions of preventers

Security Function Framework

Security function =

Mechanism with Purpose

Security Function Framework

Technology

- Construction
- Material
- Manufacture
- Operation

How is the product realised so as to support the preventive mechanisms and address all other purposes?

Case study – the Grippa Clip

Niche

- Security product
  - Intended to reduce risk of crime

Or…

- Securing product
  - Reduces risk of crime whilst serving other purpose

Purpose

Face-value purpose as a securing product

- Reduce risk of misappropriation
  - Prevent theft of customers' bags in bars
- Make bar environment tidier and safer
  - Hang up bags neatly, reduce trip hazard

Principal purpose *for whom*?

- For *society*, principal purpose is hygiene
  - Protect citizens' property cost-effectively
  - Reduce policing/CJS costs
- For *customers*, principal purpose is
  - Theft prevention = security product
- For *bar managers*, principal purpose could be
  - Protect reputation of bar – avoid customers becoming victims and not returning, present image of 'caring bar'
  - Avoid hassles from police about crime problem
  - Avoid bar staff spending time on looking after customer-victims

Desire/hygiene requirement for whom?

- For *society*, hygiene requirements include
  - Health and safety – nobody hurt by clips
  - Sustainability – low carbon in production
  - Economy/cost-effectiveness e.g. if police paying for installation
- For *customers*, desire requirements include
  - Attractive, reassuring
  - Easy to use
  - No risk of injury or damage to clothing
  - No looking uncool
  - No risk of forgetting bag on departure

Desire/hygiene requirement for whom?

- For *bar managers*, desire requirements include
  - Economical
  - Easy to install/uninstall
  - No damage to tables e.g. when stacking
  - Easy to clean
  - Does not scream ‘crime problem’ (hence ‘tidy and safety’ purposes)
  - Fits décor
  - Satisfies societal hygiene functions to meet obligations/regulations

Mechanisms and *Technology*

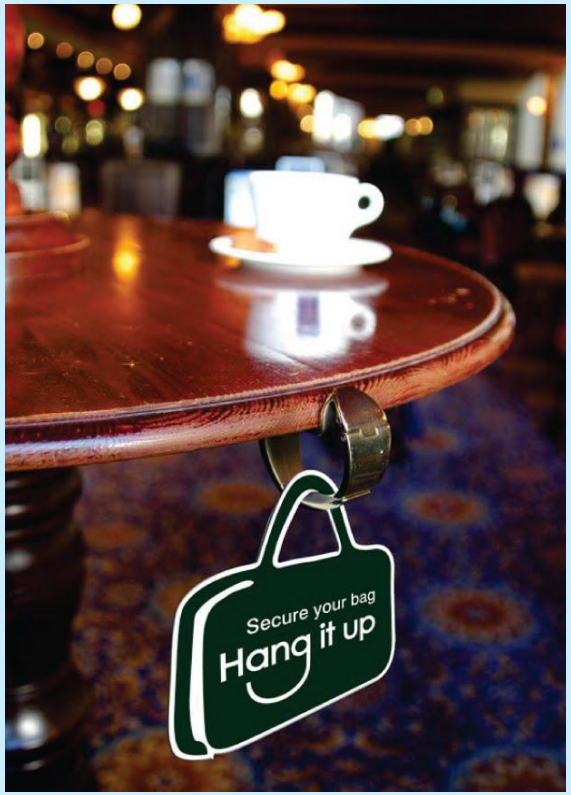
- Easier to present the two using *by statements*
- Substantive mechanisms
  - Block removal of bag by anchorage *by clip screwed to bulky/heavy table (gape, strength of clip/mount)*
  - Block *stealthy* removal by requiring thief to make visible and unambiguously malintentioned hand movements *by gate or curved exit track*
  - Make thief feel uncomfortable in close proximity to owner's personal space *by mounting clip close to owner's lap*
  - Do these *differentially* so bag owner is not inconvenienced *by having gate/track aligned towards owner*

Mechanisms and Technology

- Perceptual mechanisms – deter and discourage offender by
  - Making clip *look* robust and tricky and likely to attract attention if bag removal attempted from wrong position *e.g. by stout (looking) shape, and accurately-modeled hinge*
  - Making bar seem a security-conscious place *e.g. by visible presence of clips via prominent mounting and colour*

Mechanisms and *Technology*

- Indirect mechanisms – mobilise preventers
  - Mobilise **customers** to use clip
    - Alert to crime risk *e.g. by hanger communication*



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    - Inform how to use clip, *by self-evident operation*, *by bag graphic or adjunct communication - hanger*
    - Motivate – e.g. *by 'pleasure to play with'*
    - (or remove demotivators e.g. inconvenience, fear of forgetting) *by easy operation, mounting where bag visible, fitting with natural security behaviour*
    - Empower *by use of clip to thwart thief*

Mechanisms and *Technology*

- Indirect mechanisms – mobilise preventers
  - Mobilise **bar staff** to get customers to use clip, e.g.
    - Alert and Empower *by briefing procedures/posters*
    - Motivate *by orders*
  - Mobilise **bar management** to install clips and mobilise bar staff to encourage use *by designing clips to meet all purpose, desire and hygiene requirements previously listed (e.g. matching furniture style/construction)*

Final thoughts

- These 4 levels of the Security Function Framework resemble a **patent claim** – *Purpose served through security niche by mechanism realised by technology* – albeit patents also have diagrams
- SFF can be used not just to describe what's done, but prospectively, – e.g. specification for blast-resistant railway carriage (Meyer and Ekblom) – also indicating wide scope of framework
- Can apply to all crime prevention, not just that delivered through design of products/places