Innovation, Security and Crime

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- What is innovation?

- What is the scope of innovation?

- How important are human/ social factors in innovation?

- What is social innovation?

- Example of technological/ social innovation in urban security

- Why should we innovate in urban security?

- What are the tactical challenges of innovation in urban security?

- What are the broader challenges that innovation in urban security must address?

- How can we support innovation in urban security by local governments and others?

- Example future trends of interest to crime/security

- **Innovation** is the successful exploitation of new ideas – in other words, creativity deployed to a specific purpose

- **Creativity** is the generation of new ideas

- Creativity becomes innovation through **Design**, which shapes novel ideas to become practical and attractive propositions for users or customers

- Innovations can occur
  – In security (e.g. a new anti-counterfeit banknote)
  – Elsewhere in commercial/social world, with implications for crime and security (e.g. drones)
  – By criminals and terrorists themselves (e.g. a new legal narcotic, a new way to deliver poison)

- Innovation covers
  - Products – e.g. drones
  - Places – e.g. secure buildings
  - Services – e.g. fraud-resistant social benefits
  - Procedures – e.g. application for citizenship
  - Organisations and Governance
  - Systems and ICT

- **ICT** blurs these distinctions

- ICT and the hyperconnectedness that it brings, is a major game-changer – disruptive and an accelerant of innovation
  - Constraints of **time/distance/inertia** annihilated
  - **Cost/effort** of obtaining, manipulating and acting on data decreased, **scale** increased
  - **Scope** – aspects of our lives, activities, transactions that were previously never practical to obtain information on, to influence and to engage with (citizen science, crowdfunding, online fraud)
  - **Speed** – rapid development/ diffusion/ deployment

Future of Social Networking with Augmented Reality
Concept investigation by Matthew Buckland (matthewbuckland.com) and Philip Langley (@royalalien) of 20fourlabs.com

- Even the most technological of innovations has human and social dimensions which can cause it to succeed or fail – examples from crime and security
  - **CCTV** – someone has to monitor it and make decisions, initiate action – so performance factors, e.g. attention span, are vital
  - **Door locking systems on public housing** – different individuals, organisations or companies must specify, buy, fit, operate and maintain them, and they often fail
  - **Anti-stab kitchen knife** – technically clever
    - But imagine giving this as a wedding present!

  - **Anti-bag theft clips for tables in bars** – worked in Barcelona but not in some British pubs
    - The supporting attitude/behaviour of bar personnel was vital

  - In **crime** and even **terrorism**, social factors are important in innovation too
    - **Timing device for bombs** – the engineers of the Provisional IRA invented a new timer which relied on acid eating its way through a condom
    - This worked perfectly but none of the operatives would use it in case their Catholic mothers or aunties found the stash of contraceptives

- **EU**:
  - New ideas that meet social needs, create social relationships and form new collaborations
  - These innovations can be products, services or models addressing unmet needs more effectively

- **Stanford Uni Business School Center for Social Innovation**:
  - The process of developing and deploying effective solutions to challenging and often systemic social and environmental issues in support of social progress
  - Involves cross-sector fertilisation via:
    - Exchange of ideas and values
    - Shifts in roles and relationships
    - Integration of private capital with public and philanthropic support

- Project in Kvadraturen district, Oslo
- Location was under-used, some fear of crime
- Major output was development of the 'eBenk' www.ebenk.no
  - Aimed to increase links between people and area
  - To generate connected, safe and people-centred street experiences via mechanisms ranging from informal surveillance to placemaking
  - Technically, by offering multiple sitting positions, free on-street wifi, free charging for mobile devices, ambient lighting and an electricity point to supply public activities
  - In a pilot test, number of users and uses per hour increased between 150-250%

- Project was an example of **reframing**
  - Reframing of the **problem**
    - Started out seeking **less of** crime, disorder, fear; moved on to include **more of** vibrancy
  - Also reframing of the **framework** used to analyse the problem and generate solutions
    - **Security Function Framework** > **Vibrant Secure Function Framework**
    - Marcus Willcocks, Paul Ekblom and Adam Thorpe (2019) 'Less crime, more vibrancy, by design', in Rachel Armitage and Paul Ekblom (Eds), *Rebuilding Crime Prevention Through Environmental Design: Strengthening the Links with Crime Science.* Taylor and Francis.

- Current solutions to crime problems may be inefficient/too expensive, may not work, may have adverse side effects e.g. on privacy or aesthetics

- Cookbook replication of success stories doesn't work. Crime prevention needs attuning to context, which has multiple dimensions. Every replication involves innovation, including an iterative process of development

- New crime problems emerge, also new constraints, possibilities or contexts – e.g. funding source dries up, priorities change, a law or a policy changes in the operating environment

- Adaptive criminals may exploit new technology to overcome existing security measures – arms races

- Special challenges and opportunities of ICT – major accelerants of the arms race
  - Dark Web offering 'criminal services' – credit card numbers, passwords, script kiddies (virus kits)
  - 3D printing of weapons, keys for handcuffs, fascias to stick on cash machines to steal bank card data

What are the tactical challenges of innovation in urban security?

UCL

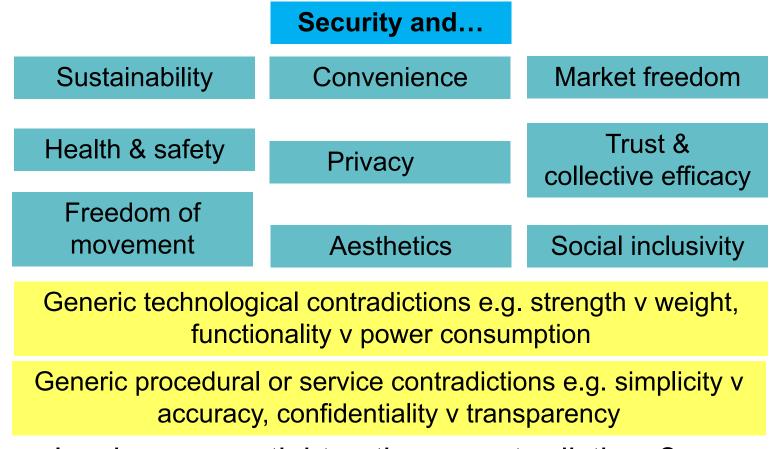- We can identify **tactical 'script clashes'** between offenders and security

Wield force v resist (Damage v protect, Injure v keep intact)	Take v keep	Snoop v maintain privacy
Act at will v control misbehaviour	Confront v avoid	Pursue v escape
Conceal traces and tracks v detect	Surprise/ ambush v be alert	Trap v elude
	Challenge suspect v give plausible response	Conceal criminal intent v detect
	Surveill v conceal	

- These clashes
  - Influence **criminal plans and outcomes**
  - are **generic and perennial** – will always need to be faced
- Innovations elsewhere in society – e.g. the cordless electric drill, the camera on the smartphone – can **disrupt the balance** of these clashes, and favour one side over other
- We must design things to **advantage the good side**
- Approaches to **inventiveness** like TRIZ highlight these contradictions, and also identify **evolutionary trends in invention**

- Various broader **design contradictions** can hold back exploitation of current/future technologies by the security side (offenders are less constrained):

Security and…		
Sustainability	Convenience	Market freedom
Health & safety	Privacy	Trust & collective efficacy
Freedom of movement	Aesthetics	Social inclusivity

Generic technological contradictions e.g. strength v weight, functionality v power consumption

Generic procedural or service contradictions e.g. simplicity v accuracy, confidentiality v transparency

- Will innovations relax, bypass, or tighten these contradictions?
- Can we steer them in beneficial directions, or at least be ready with mitigations?

- Given changing social/ technological context, adaptive offenders and co-evolutionary arms races, **the strategic requirement is for us to develop the capacity to out-innovate them and disseminate it**

  – Encouraging **variety** of solutions – **design freedom** and related approaches e.g. **performance standards**

  – **Plausibility** – using tested theory and practical knowledge to **generate** candidate innovations and boost the chance that they will work first time or with only minor adjustments

  – **Systematic approach to capturing knowledge**

    • **Modular** – enables elements of successful action to be **recombined** (e.g. a failed burglary project may have developed good methods of mobilising residents, which are **transferrable** to other projects)

    • **Process-oriented** – e.g. **5Is** (Intelligence, Intervention, Implementation, Involvement, Impact) – we can innovate under each of these crime prevention tasks

  – Making **resources** available for experiments, iterative improvements – difficult under austerity, but necessary

  – **More tolerant attitude to risk/failure** – organisational subculture, media strategy…

  – **Open innovation** (but beware aiding offenders)

  – **Involvement** of wide range of **stakeholders** including private sector, civil society organisations and researchers – **consulted** and indeed included in **co-design, co-development and co-production** of security

- **Anticipation** of new problems, constraints, possibilities or contexts – **horizon-scanning**, **crime-proofing** of designs of new products and places, **crime impact assessments** of new services…

Example future trends of interest to crime/security

Applications

- Drones
- Autonomous vehicles
- Smart rail signalling systems
- Non-GPS navigation
- Blockchain
- Brainwave reading/ control
- Smart lighting
- Performance-enhancing prosthetics
- Instructional technology
- Script kiddies

Generic technologies

- Hyperconnectivity
- AI
- Robotics/ Nanobots
- Quantum computing
- SCADA
- 3D printing
- Mass customisation
- Portable, renewable power
- Wearable ICT
- Smart materials
- Stealth technologies
- Sensors, sensor fusion
- IoT
- Pharma
- Chemical synthesis
- GM/ CRISPR
- Advanced optics
- Hacking (both senses)

Background changes

- Climate change
    - Temperature
    - Sea level/ acidification
    - Water, food shortage
- Mass migration
- Antimicrobial resistance
- Commodity scarcities
- Commodity substitution e.g. Mo for Pt catalysts
- Circular economy
- Universal wage
- New finance/ banking models
- New working patterns
- New transport/ movement patterns
- Any concentration or dispersal of value, anywhere in the value chain

I look forward to our collaboration and co-production on the new Working Group on Innovation and Security!