Ensuring effectiveness and efficiency in security screening: the contribution of Human Factors

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Andrew McClumpha
Background to requirement for sustainable innovative solutions

Human Factors Integration

Implementing solutions
There is persistent and increasing pressure on security officers to achieve effective and sustainable performance.

**Increasing pressure on Security Officers**

- Increasing regulatory demands and audits
- Increasing use of 2\textsuperscript{nd} and 3\textsuperscript{rd} Gen technologies
- New emerging threats
- New skills and training required
- Need to meet Key Performance Indicators
- Increasing passenger demands
- Increasing airport /airline demands
A Human Factors programme demonstrates a strong commitment to innovation and is the ‘glue’ to ensure an effective security system.

Potential areas involved in an airport security Human Factors Program to deliver security and service:

- Defining job roles (e.g. supervisor, team leader)
- Understanding what makes a successful Security Officer
- Choosing staff with the right skills
- Establishing monitoring, training, incentive regimes
- Assess, and managing security officer motivation
- Providing KPMs for security tasks

- Giving passengers the information they need to prepare for security and improve the ‘passenger journey’
- Deploying staff resources to minimise down-time but ensure individual effectiveness
- Providing a positive working environment (e.g., security culture)

- Determining user and operational requirements for security technology
- Tailoring technology to the specific checkpoint through rapid prototyping, simulation, and operational trials
- Developing training material (for security officer’s) in advance of deployment
- Developing and managing competence frameworks
Human Factors looks at improving and sustaining operational security but essentially addresses the following questions:

- Human Factors focuses from the security officer, to their Management, to the Regulator, but essentially through different means asks the following questions:

- Can this person...
  - ... with this training...
  - ... do these tasks...
  - ... to these standards...
  - .... with this equipment....
  - ..... within this working environment....
  - ... under these conditions?
....but, security stakeholders have different challenges that can limit the potential to achieve consistent and sustainable security

**Regulators**
- Require objective analysis and evaluation of new technologies and processes to decide effectiveness
- Primary focus is on threat detection not cost or operational impact
- Requirement to encourage innovation and remain neutral

**Equipment Manufacturers**
- New concepts and ideas are often not in line with industry and regulator requirements resulting in:
  - increased costs
  - inefficient use of R&D resources and budgets
- Various challenges in obtaining requirements from regulators and airports

**Airport Industry**
- Want to rapidly implement new technologies and processes but are uncertain of:
  - Impact on operations
  - Cost
  - Performance effectiveness
- Often frustrated by the amount of time taken by regulators to approve technologies

The application of Human Factors Integration in system design can increase operational effectiveness and reduce costs over full life cycle of system

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Human Factors Integration

Implementing solutions
Human Factors Integration (HFI) in supporting and managing security technology design, development, and implementation

**Purpose of HFI**

- Ensures application of human factors knowledge about human characteristics throughout the design, development, and evaluation of technology systems
- Provides balanced development of technical, operational, and human aspects
- Provides an audit trail demonstrating human factors issues have been adequately addressed during system design and development
- Provides comprehensive guidance to system developers, system procurers, airport authorities and end users

**HFI Domains**

- Training
- System Safety
- Health Hazard Assessment
- Human Factors Engineering
- Manpower
- Personnel

HFI typically covers six key areas
A Human Factors Integration Standard has been developed to leverage the full capability of emerging security technologies.
Content

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Human Factors Integration

Implementing solutions
An empirical measure of screening effectiveness has great potential to support continual operational effectiveness

**Aim**
- A valid, reliable, and operationally usable operational checklists have the capability to improve performance and achieve a more standardised approach to passenger security screening

**Benefits**
- Standard view across Airports and Screening Service Providers that defines “good” performance
- More effective identification of required performance enhancements
- Validated tools for
  - Individual and group performance assessments
  - Training evaluations
  - Procedure evaluations
- More rapid and effective feedback of performance than covert testing procedures are able to provide
- Diagnostic recommendations based on observed and accrued evidence
The KPM Checklists

The KPM tools, currently in the form of paper-based checklists, have been developed for all checkpoint screening tasks:

- **Passenger frisk (male / female)**
- **Baggage hand search**
- **Explosive Trace Detection (ETD)**
A valid, reliable, and standardised basis for operational assessment of Security Officers’ tasks is now available

- For the very first time standardised operational performance assessment tools have been developed and validated for the range of Security Officers’ tasks
- These tools provide a low cost operationally valid, quantitative performance assessment technique
The ACI Guide to Airport Security was formally published in February 2014
The document provides detailed leading practice information for each component of four high level categories.
The ACI guide to the assessment of Human Factors in Checkpoint Security includes a self diagnostic assessment.
For each area the airport can assess their level of approach.
It is important to consider motivation and its organisational and managerial influences in supporting sustainable aviation security

- Many studies have referred to the importance of motivated security officers, but no comprehensive research has specifically looked at:
  - what makes a security officer motivated
  - ...and what makes them demotivated
Why achieve a motivated workforce?

Operational benefits of a highly motivated workforce

- Low rates of absenteeism
- Staff turnover is at an acceptable level
- Low number of security breaches
- High standard of KPIs
- Easier to obtain shift cover at short notice with staff willing to support
- Security officers change roles and positions with limited or no complaint and operate effectively
- High pass rate for qualifications and certifications
- Frequent and structured communication between management and security officers
- Positive security culture throughout the organisation

Sydney airport and SNP, looked at motivation and culture which resulted in voluntary turnover decreasing from 22% to 14%, and absenteeism reducing from 700 days per month to an average of 290 days
Three documents enable airports to assess, diagnose, and implement solutions to improve motivation.

1. **Security Officer Questionnaire**
   - Validated questionnaire for Security Officers

2. **Analysis Tool**
   - A simple data analysis tool of the questionnaire results

3. **Guidance Document**
   - Comprehensive guidance document to providing advice on targeted interventions
Sustaining effective security and ensuring innovation through continuous improvement can be affordable and implementable

- Human Factors solutions focus from the end-user to management to the regulator, but address how to achieve the most efficient and effective systems ensuring that:
  - **This Security Officer can:**
    - ... with this training...
    - ... do these tasks...
    - ... to these standards...
    - ... with this equipment....
    - ... under these conditions...
    - ... sustainably, efficiently and in a motivated and error tolerant manner
  - And so provide the essential support to effective and efficient aviation security in its role of mitigating the persistent terrorist threat
Andrew McClumpha
Director

McClumpha Associates

M: +44 (0) 788 043 9352
E: amcclumpha@mcclumpha-associates.com