

HSPD-24 – Technology Panel



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Growth of Government-wide Biometrics Policy



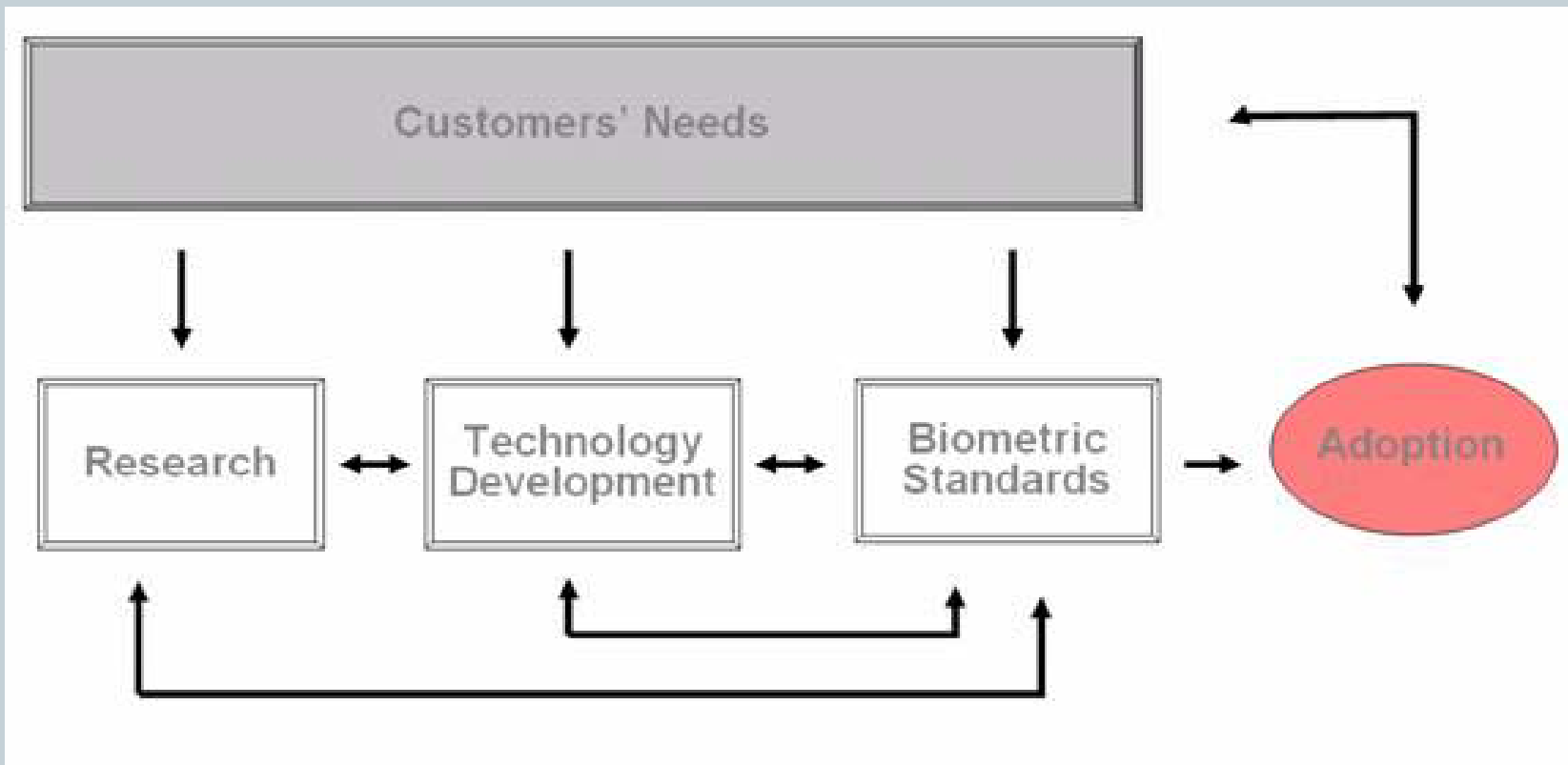
- **Executive Order 12881**
- **HSPD-6**
- **Executive Order 13354**
- **HSPD-11**
- **HSPD-12**
- **HSPD-15**

How can academia help



- **Play an active role to meet the challenges associated with government ID management requirements**
 - Core R&D
 - Applied R&D
 - ✦ Participation on standards
 - ✦ Testing and Evaluation of Products
 - ✦ Working with certification bodies
 - ✦ Training (external and within the curriculum)
 - ✦ Testing effectiveness of standards
 - ✦ Play an advisory role for those that need to implement standards

Academia and Standards



Interoperability of Fingerprint Sensors



- HSPD 24 highlights the importance of using compatible methods of data collection
- Fingerprint sensors introduce distortions and variations in the images captured by the sensor
- Matching fingerprints collected on different types of sensors increases probability of false accepts and false rejects
- Fingerprints collected at border control might not work well with fingerprints collected on a mobile device in the field

Interoperability



- **MINEX Test evaluated interoperability of fingerprint template generators and matchers**
- **Currently conducting research on statistical testing of interoperability of sensors**
- **Evaluating a compensation model to remove geometric inconsistencies between fingerprint images**

MultiBiometrics



- **Next Generation Identification systems will be capable of capturing and storing multiple biometrics**
- **Key challenge is how to fuse the multiple biometric traits to improve matching ability**
- **Extend the knowledge of image quality from single modality to impact of quality on multiple modalities**

Testing Effectiveness of Standards



- Are standards helping to maintain the matching ability while promoting data exchange, standardized capture methods, and use in multiple applications?
- Large scale tests required to understand the impact of standards (MINEX, IREX)

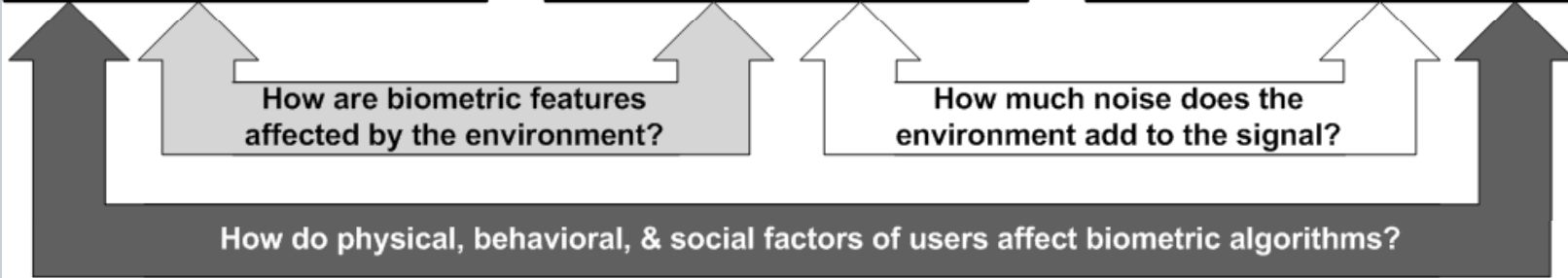


Biometric System Ergonomic Design

Users

Environment

Algorithm





- What impacts the performance of a biometric system?
 - Is the algorithm the cause of matching errors?
 - Is the application/environment the problem?
 - Is the design of the sensor the problem?
 - Are the users the problem?
 - ✦ Cannot do what the system/sensor is asking for.
 - ✦ Do not understand how to use the system/sensor.
 - ✦ Cannot produce repeatable images.

HBSI Evaluation Method

Usability

Image Quality

Qualitative

Quantitative

Ergonomics

Biometric System Performance

User Satisfaction

Efficiency
Effectiveness
Learnability

Survey
Failure to Use (FTU)

Task Time
Number of Errors per User
Number of Assists
% Task Completion

Quantitative

Hand Size
Length & Width of fingers
Finger Circumference

Image Size
Image Quality Score
Image Contrast
Minutiae Count

Failure to Acquire (FTA)
Failure to Enroll (FTE)
Matching – (FAR) and (FRR)

Improving Image Quality



- **Image Quality**

- ✦ Good image in = good performance
- ✦ How do we get good images???
 - Understanding how the devices work optimally
 - Understand where the data capture “sweet spot” is (mobile iris for example)
 - Improve image quality
 - Change the design of the devices
 - Focus groups of specific populations