

Enhancing the Human Factor in Security Screening

Slavtcho Groshev
Project Manager

January 2018 - Counter Terrorism Symposium Miami

A large, white, abstract graphic element consisting of several overlapping, curved shapes that resemble a stylized arrow or a modern architectural element, pointing towards the bottom right corner of the slide.

Overview

- › Introduction: CASRA
- › Sociotechnical Approach
- › Determinants of Screener Performance
- › Image Interpretation Competency
- › Systematic Threat Assessment
- › Technological Progress
- › Level of Automation
- › Work Design
- › Take Home Message

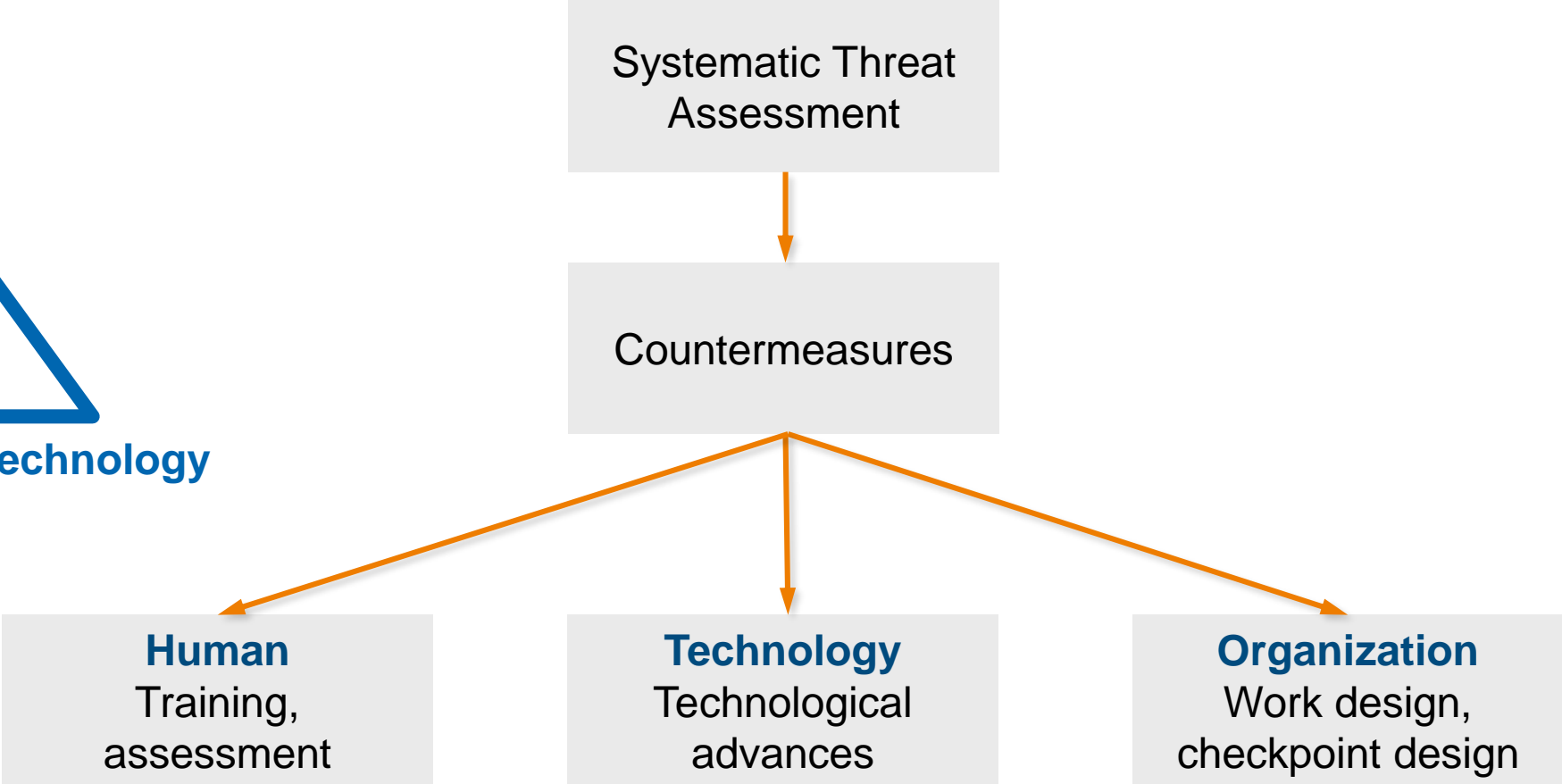
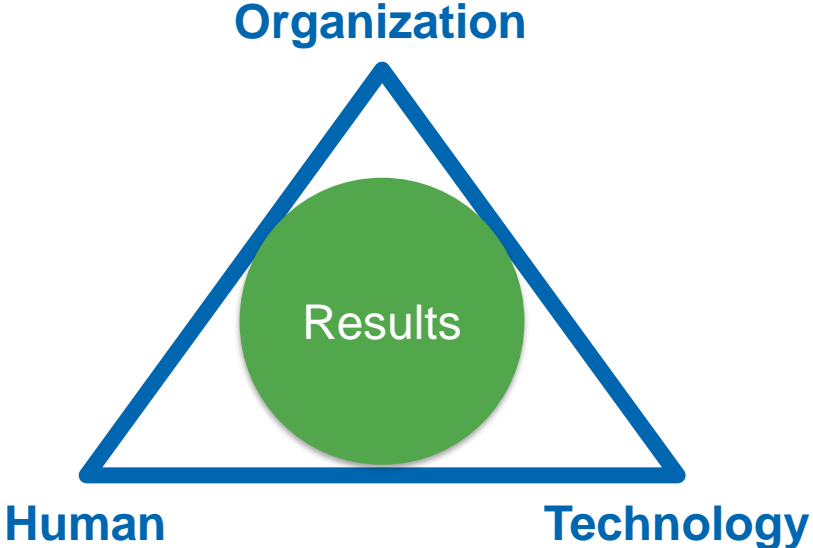
Introduction: CASRA

- › Aim is increase of security and facilitation at airports and other environments involving people and security
- › Located in Zurich, Switzerland
- › Founded in 2008
- › Emerged from the Visual Cognition Research Group (VICOREG) at the University of Zurich (founded in 1999)
- › About 35 employees (mainly psychologists, computer scientists, and engineers)

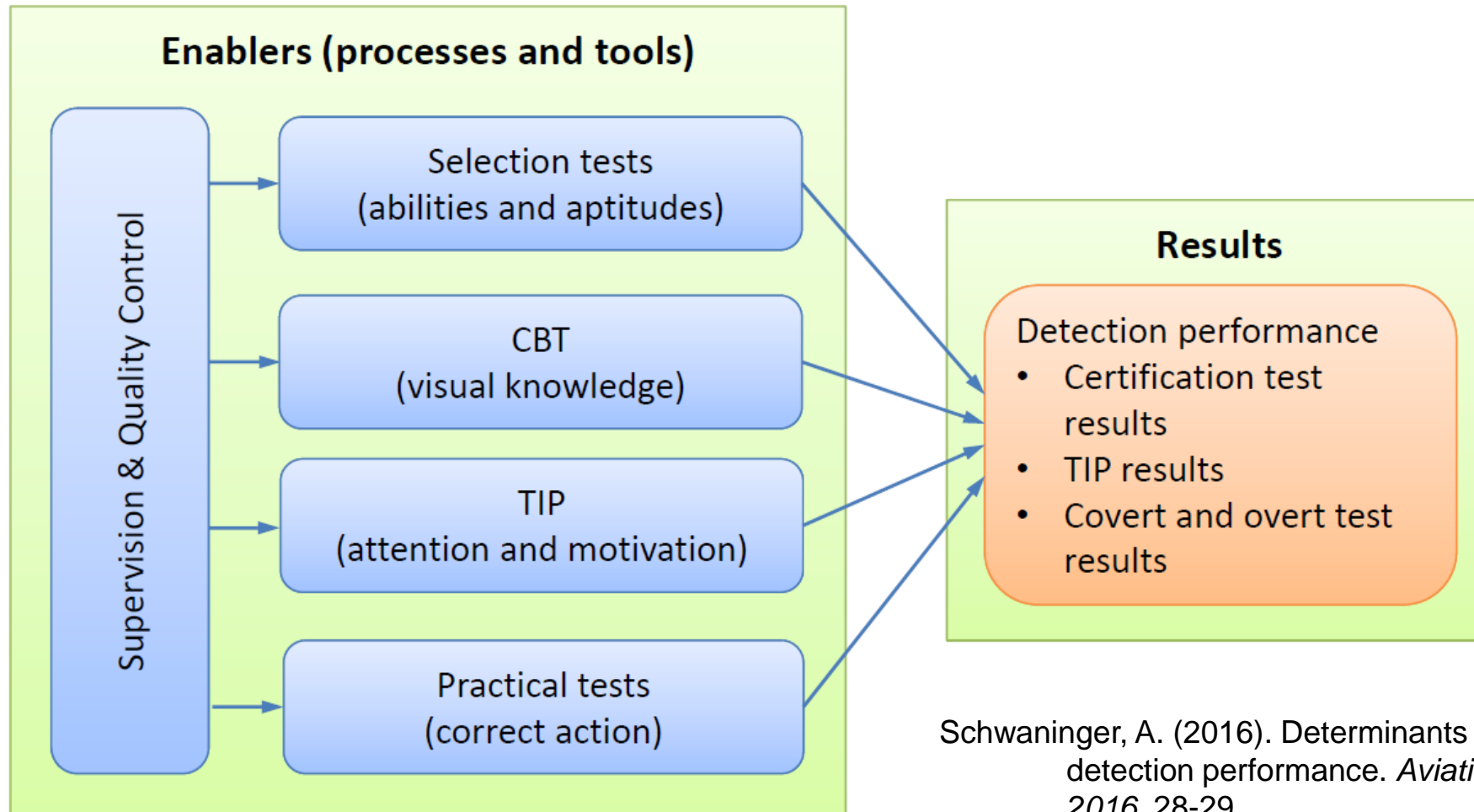


CASRA = Center for Adaptive Security Research and Applications

Sociotechnical Approach

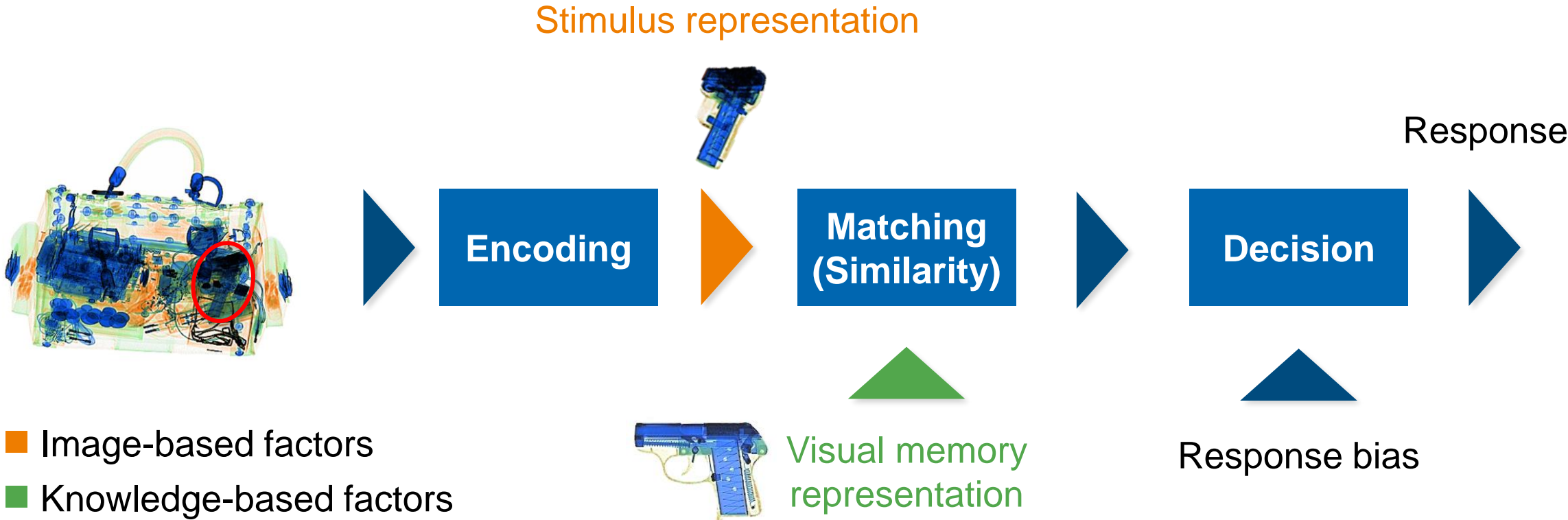


Determinants of Screener Performance



Schwanger, A. (2016). Determinants of airport security X-ray screeners' detection performance. *Aviation Security International*, August 2016, 28-29.

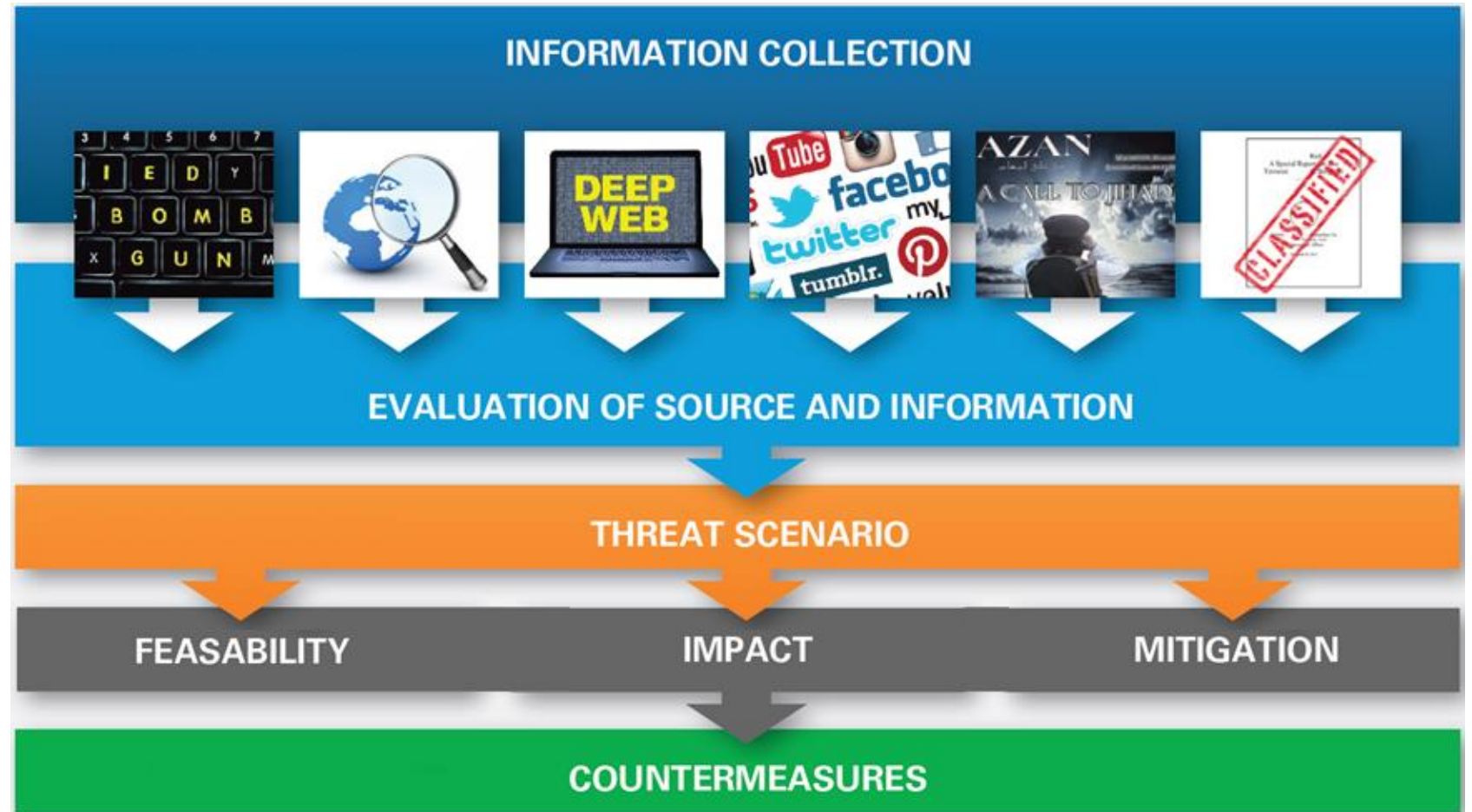
Image Interpretation Competency



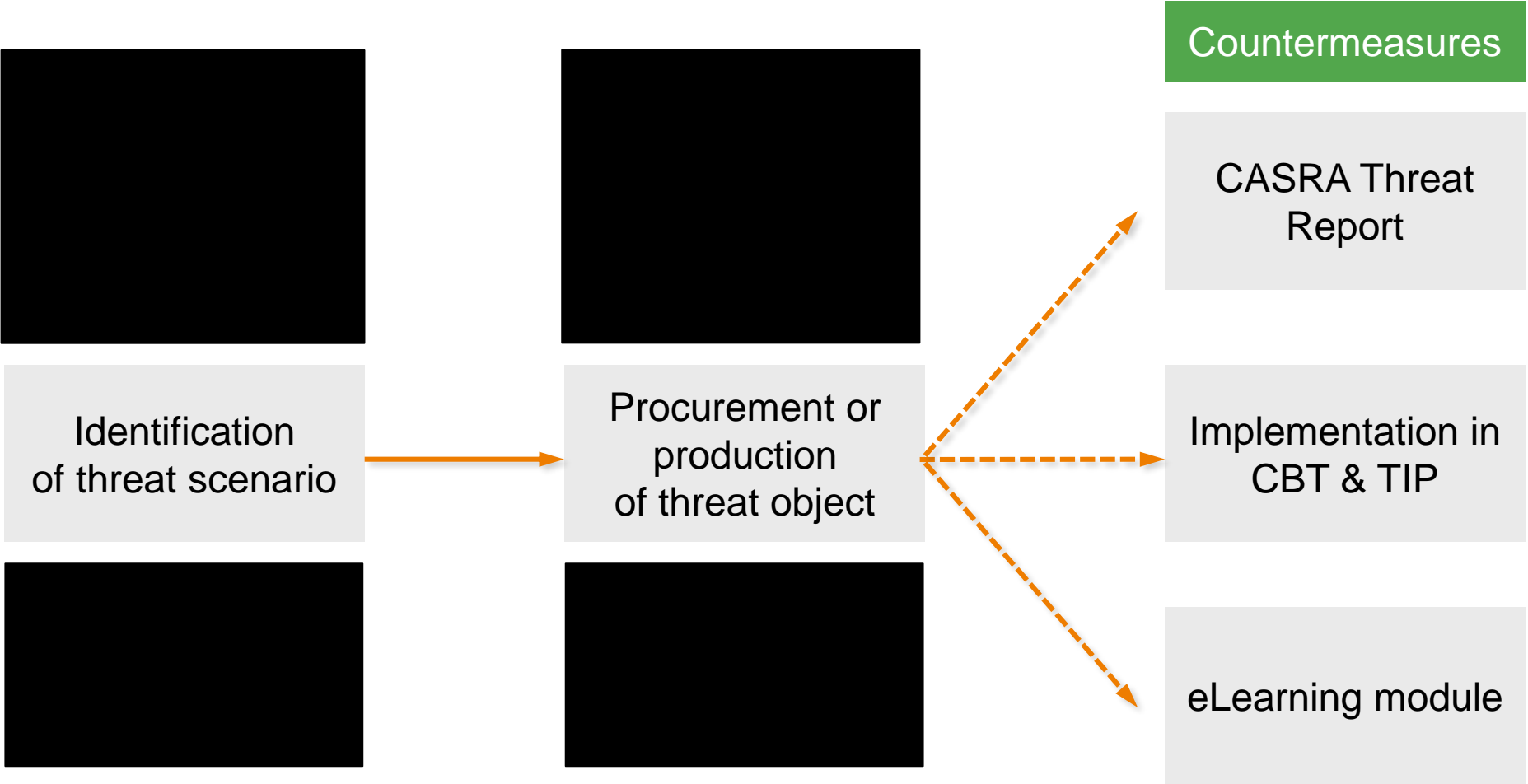
Schwaninger, A., Hardmeier, D., & Hofer, F. (2004). Measuring visual abilities and visual knowledge of aviation security screeners. *IEEE ICCST Proceedings*, 38, 258-264.

Systematic Threat Assessment

- › Goal: Increasing threat detection performance by combining intelligence with competence of security officers
- › Funding: Swiss Federal Office of Civil Aviation (FOCA), since 2013
- › Scope: All Swiss airports and security screening providers
- › Collaborations: Swiss airports, police authorities, federal competence centers and screening providers



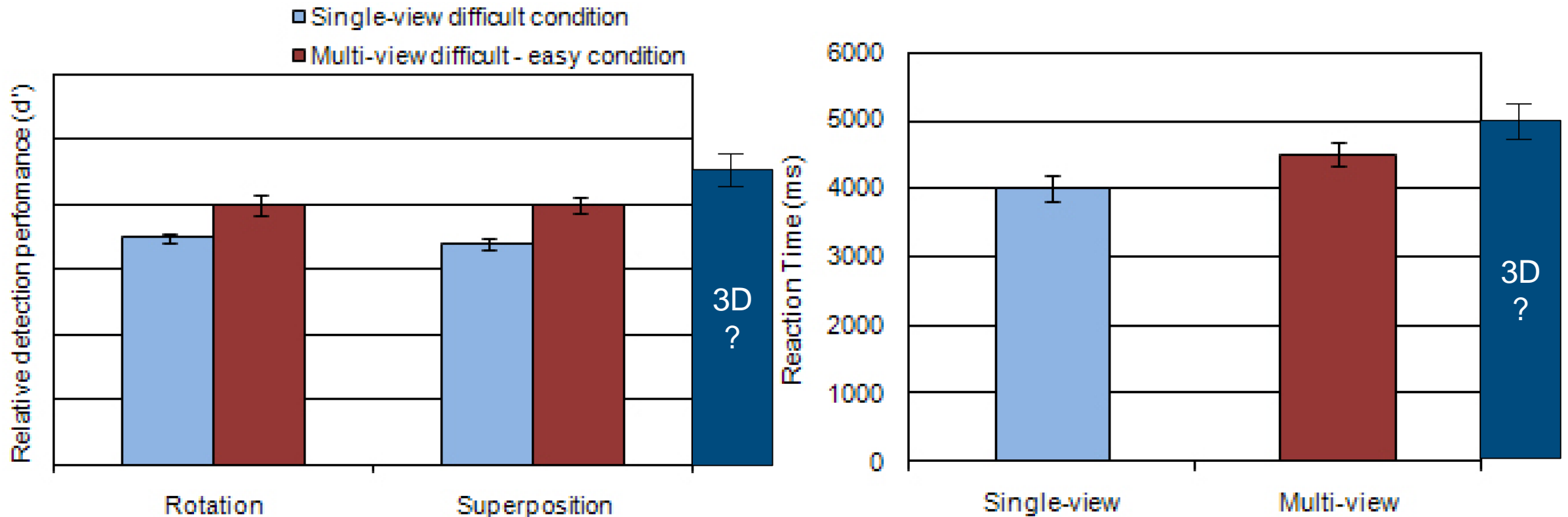
Systematic Threat Assessment (Continued)



Technological Progress

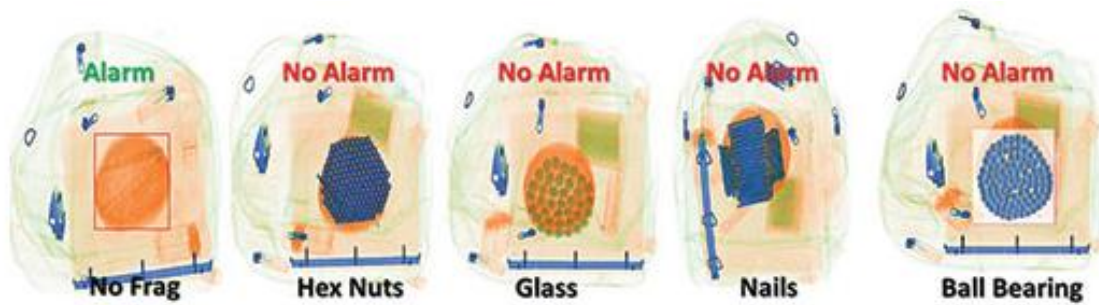


Technological Progress (Continued)



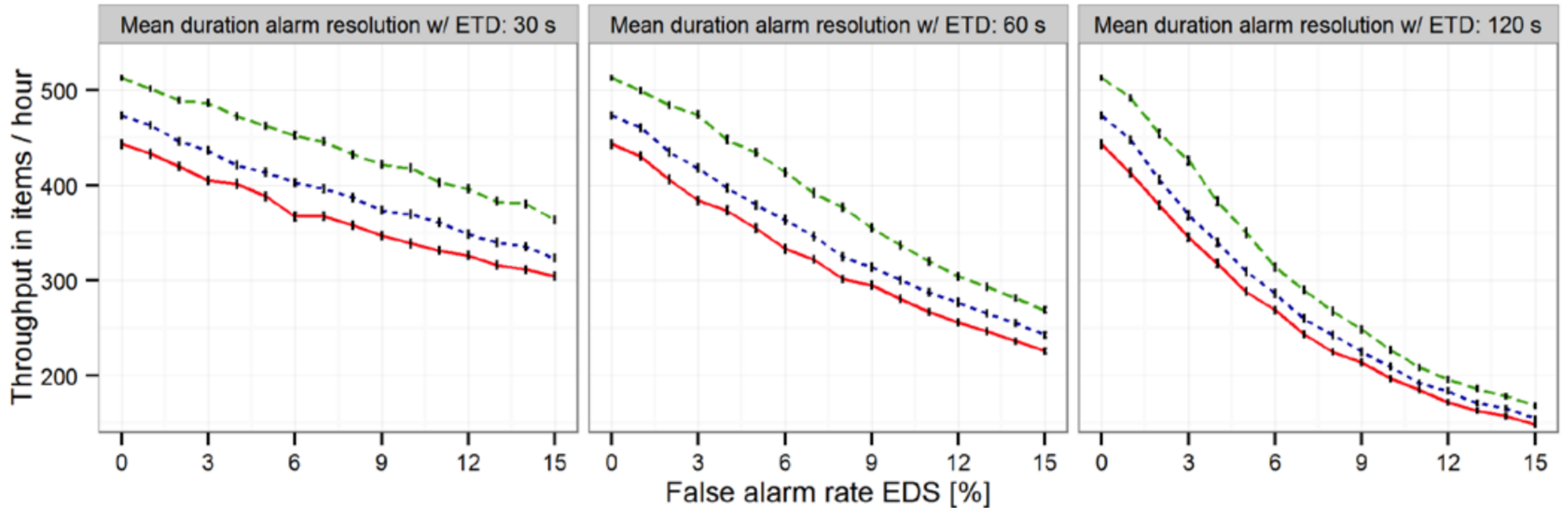
von Bastian, C., Schwaninger, A., & Michel, S. (2008). Do multi-view X-ray systems improve X-ray image interpretation in airport security screening? *Zeitschrift für Arbeitswissenschaft*, 3, 166-173.

Level of Automation



Howell, J. (2017). The Modern IED: Design and Trends. *Aviation Security International*, 23(4), 34-37.

Level of Automation (Continued)



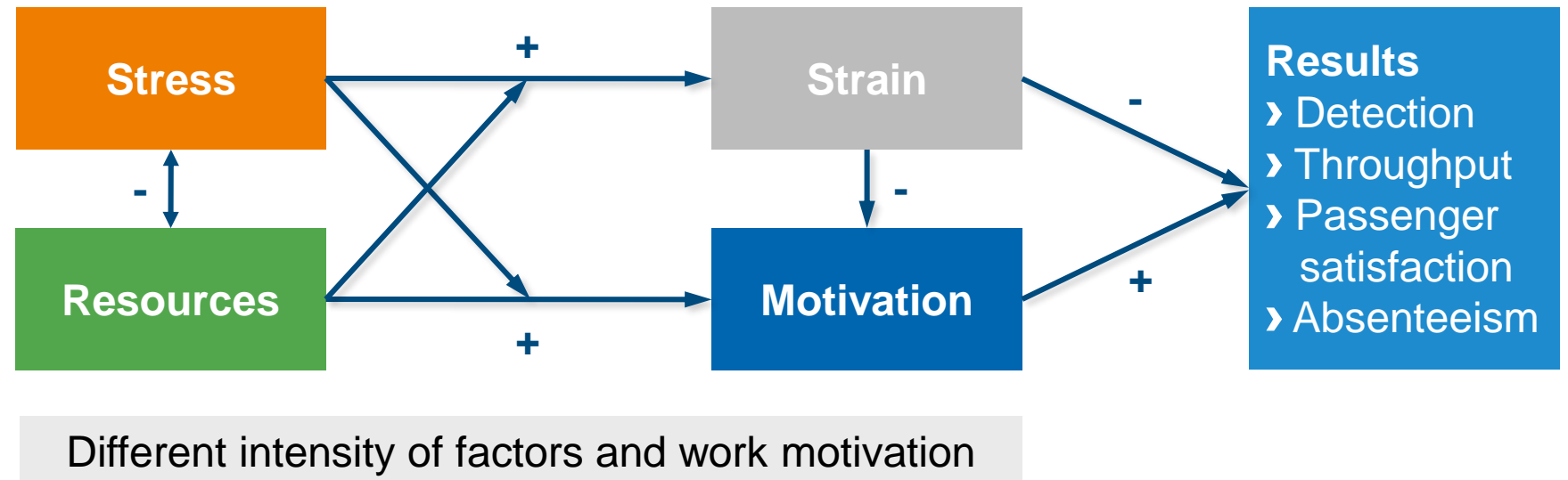
Sterchi, Y., & Schwaninger, A. (2015). A First Simulation on Optimizing EDS for Cabin Baggage Screening Regarding Throughput. *Proceedings of the 49th IEEE International Carnahan Conference on Security Technology, Taipei Taiwan, September 21-24, 2015*, 55-60.

Work Design

Influence of organizational factors on detection, throughput, passenger satisfaction, and absenteeism

- › External working conditions (e.g. noise)
- › Work-privacy conflict, shift work
- › Monotonous tasks
- › Fear of failure

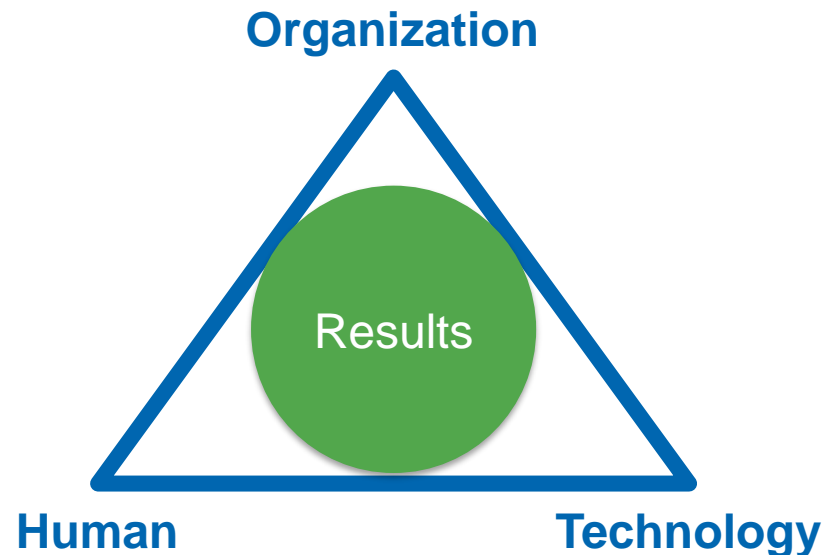
- › Social interactions
- › Clear roles
- › Leadership
- › Recovery, breaks



Bakker, A. B., & Demerouti, E. (2007). The job demands-resources model: State of the art. *Journal of managerial psychology*, 22(3), 309-328.

Take Home Message

- › Select personnel using reliable, valid, and standardized tests.
- › Continuously train them on current and emerging threats.
- › Measure performance regularly with appropriate feedback.
- › Use a sociotechnical approach by optimizing human, technological, and organizational factors and their interactions.



Thank you for your attention