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Reintroducing Human Systems Integration: Evolving Frameworks, Global Applications, and Future Directions

Hosted by: Board on Human-Systems Integration (BOHSI)

Closing Remarks; Resources; Evolving & Applying; Looking Forward

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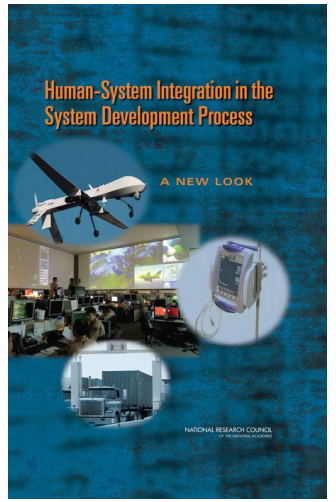
BOSHI member

MAY 2025

Resources available for practitioners, educators, & policy leaders

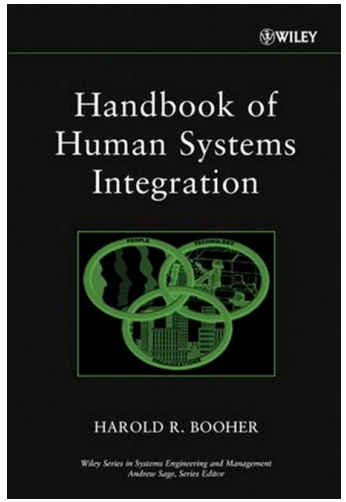
[Human-System Integration in the System Development Process: A New Look]

– National Research Council. 2007. *Human-System Integration in the System Development Process: A New Look*. Washington, DC: The National Academies Press. https://nap.nationalacademies.org/11893



[Handbook of Human Systems Integration]

– Booher, H. R. (Ed.). 2003. *Handbook of Human Systems Integration*. John Wiley & Sons, Inc.



[SAE International G-45 HSI Committee Process Standards at HSI and Domain Levels]

https://www.sae.org/standards/content/sae6906/

Resources available for practitioners, educators, & policy leaders

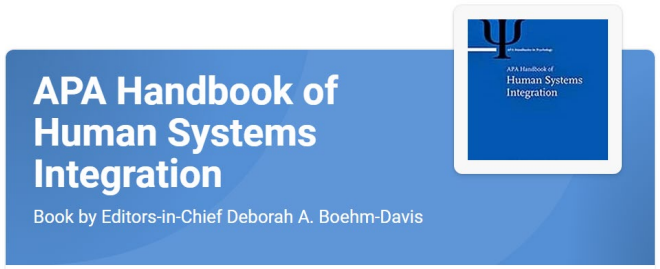
[Human Systems Integration – DoD, OUSD(R&E)]

- Office of the Under Secretary of Defense, Research and Engineering OUSD(R&E) https://www.cto.mil/sea/hsi/
- DoD Instruction 5000.95: Human Systems Integration in Defense Acquisition (2022) https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/500095p.PDF?ver=4Qa4p7JP7EPtA%3d%3d
- Human Systems Integration Guidebook (2022) https://www.cto.mil/wp-content/uploads/2023/06/HSI-Guidebook-2022.pdf

NASA Human Systems Integration Handbook (2021)

- https://ntrs.nasa.gov/citations/20210010952

- APA Handbook of Human Systems Integration
  - https://psycnet.apa.org/fulltext/2014-29521-000-FRM.pdf



Resources available for practitioners, educators, & policy leaders

Principles and guidelines for human factors /ergonomics (HFE) design and management of work systems; ILO & IEA

https://iea.cc/wp-content/uploads/2014/10/LABADMINOSH_Principles-and-guidelines-for-human-factors-ergonomics-HFE_WEB86.pdf

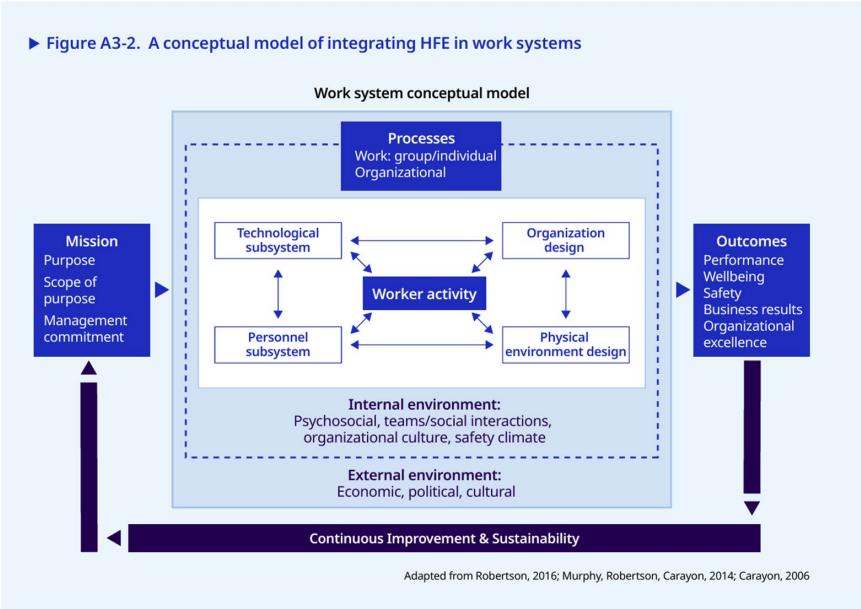
IEA International Ergonomics & Human Factors Association

International perspectives

- Cross-organizational working group with INCOSE HSI WG and IEA
  - Creating an International Ergonomics Association (IEA) Technical Committee
  - www.iea.cc : IEA Congress 2027
  - Yakir Yaniv, Israeli Human Factors and Ergonomics Association, yakir@ednu.net, info@ihfea.org.il
- https://incose.nl/incose_events/incose-hsi-conference-2024-jeju-korea/
- https://www.incose.org/communities/working-groups-initiatives/human-systems-integration

Chartered Institute of Ergonomics & Human Factors

INCOSE HSI2024 Human Systems Integration International Conference HYBRID EVENT, Jeju, Korea August 27-29, 2024



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HSI: Global Applications

- HSI in various domains: Occupations
  - Medical & Patient Safety
  - Robotics & Aging in place
  - Service, Knowledge Workers
  - Department of Corrections (DOC)
- Healthcare System Framework
  - Systems Engineering Initiative for Patient Safety (SEIPS)
- Context
  - Simple to Complex work systems

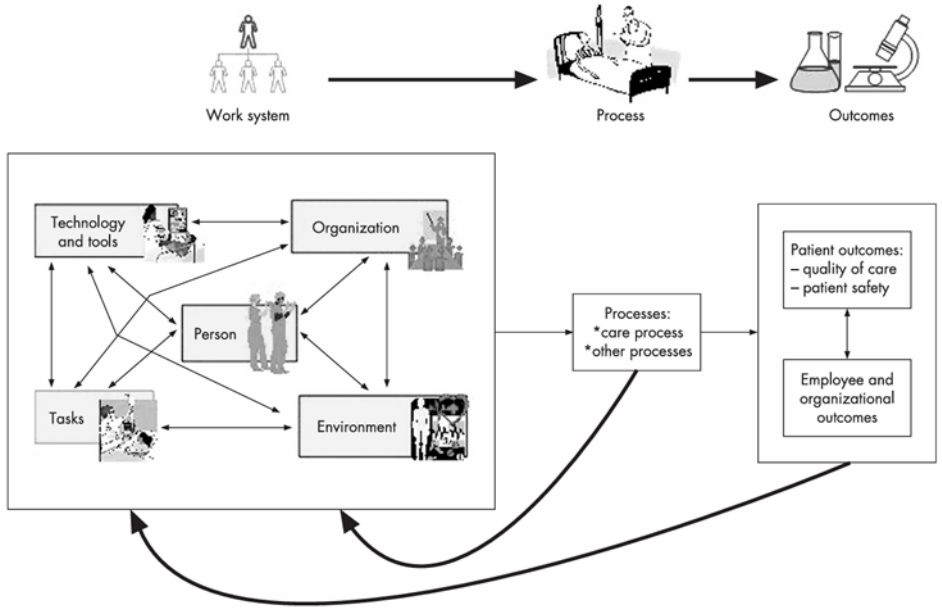


Figure 1 SEIPS model of work system and patient safety.

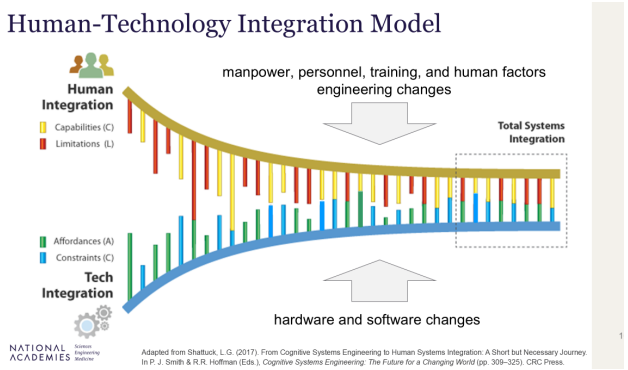
Holden, R. J., & Carayon, P. 2021. SEIPS 101 and seven simple SEIPS tools. *BMJ Quality & Safety, 30*(10), 901–910. https://qualitysafety.bmj.com/content/qhc/30/11/901.full.pdf

Applying HSI Design & Integrated Models: Observations

- Human-Sociotechnical System Integration: Integration of the Human—total system; Lifecycle; Iterative process
  - Bridging HSI and STS models, concepts with HFE approaches and disciplines (transdisciplinary)
  - Systems Management theories and approaches; Systems Engineering
- Speaking the languages; engineers; managers; stakeholders; designers
  - Education & Training; individual, group, & organizational readiness
- Participatory ergonomics approaches to design solutions
- HSI Methodologies: Modeling & Simulation-formative evaluation
- HSI case studies: ROI & management business cases
  - Trade-Offs; Outcomes
- Role of international standards & recommendations/guidelines

HSI: Looking forward & Future Directions

- Design for Sustainability
  - Continuous learning process for evaluation, training, refinement, and redesign
  - Organizational Culture; Top Management support
  - Education and Training programs; HSI
  - Methodologies: AR/VR; Systems Tools
- External environment influences/disruptions: Digital Technology, Robotics, AI, Teaming; Cobot; Global influences
  - Adaptive systems; Resilience; emergent properties
- Systems of Systems: interrelated and interactions: Safety & Performance driven



Adapted from Shattuck, 2017

Figure 1. HSI emerges from the overlapping of three main circles: (1) technology, organization, and people within an environment at the heart; (2) examples of HSI perspectives; and (3) contributing disciplines and operational domain.

https://www.incose.org/communities/working-groups-initiatives/human-systems-integration