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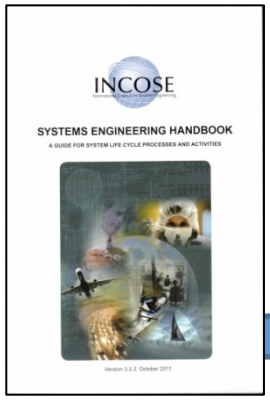
Seattle, WA
July 13 - 16, 2015

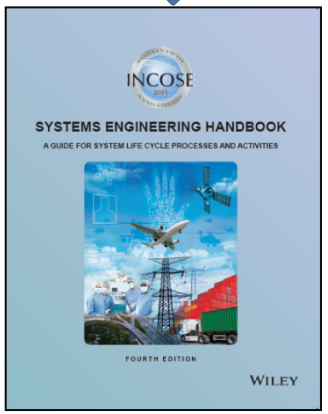
INCOSE SE Handbook Version 4: Updating the Reference for Practitioners

David Walden, ESEP, Sysnovation - Lead Editor
Garry Roedler, ESEP, Lockheed Martin - Editor
Kevin Forsberg, ESEP, OGR Systems - Editor

The INCOSE SE Handbook

- The INCOSE SE Handbook (SEH)
  - Reflects the state-of-the-practice of Systems Engineering
  - Based on ISO/IEC/IEEE 15288
    - Further elaborates the processes and activities to execute the processes
  - Inputs from the entire INCOSE Technical Community
  - Serves as a reference to practices and methods that have proven beneficial to the SE community at large
- Purpose
  - Defines the discipline and practice of systems engineering (SE)
  - Provides an authoritative reference
- Version 4 published in July 2015





The SEH serves as the basis for the CSEP & ASEP exams.

INCOSE Systems Engineering Handbook (SEH) History

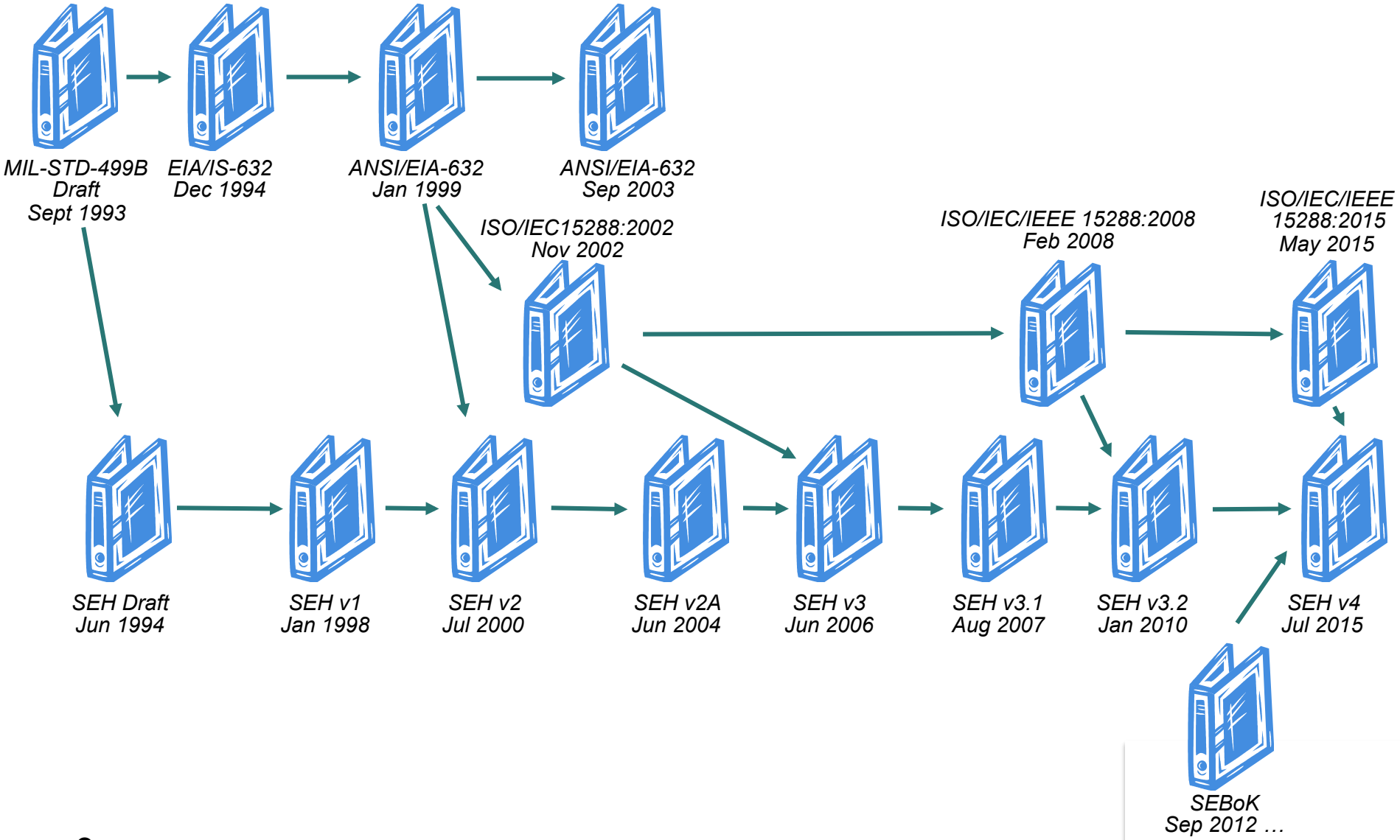


Image courtesy of Dave Walden, Sysnovation

SEHv4 Drivers for Change

- Alignment with the **ISO/IEC/IEEE 15288:2015** updates
- Refresh the Technical content based on SE state-of-the-practice with the latest inputs from the **INCOSE technical Working Groups (WGs)**
- Add **new content** consistent with the SE state-of-the-practice
- Be consistent with the **Guide to the Systems Engineering Body of Knowledge (SEBoK)** version 1.3 to the maximum extent practicable (www.sebokwiki.org)

SEHv4 Formatting Considerations

- Maintain the “spirit” of previous versions
  - Readers should see this as a logical progression in the INCOSE SEH series
- Make SEHv4 stand out as a new major revision
  - Update size of hardcopy from 6” x 9” to 8” x 10”
  - Move from single column to two columns
  - New cover art and content
- Provide new eBook formats
- Move to external publishing via Wiley distribution channels (vs. self-published by INCOSE)
  - Increase exposure
  - Higher quality product

Development Team

- Editors:
  - David Walden, ESEP, Lead Editor
  - Garry Roedler, ESEP
  - Kevin Forsberg, ESEP
  - Douglas Hamlin
  - Thomas Shortell, CSEP
- Authors:
  - 55+ Authors from INCOSE Worldwide
  - Participation by all INCOSE Working Groups
- Reviewers:
  - Quoc Do, Review Team Lead
  - 25+ Reviewers from INCOSE Worldwide

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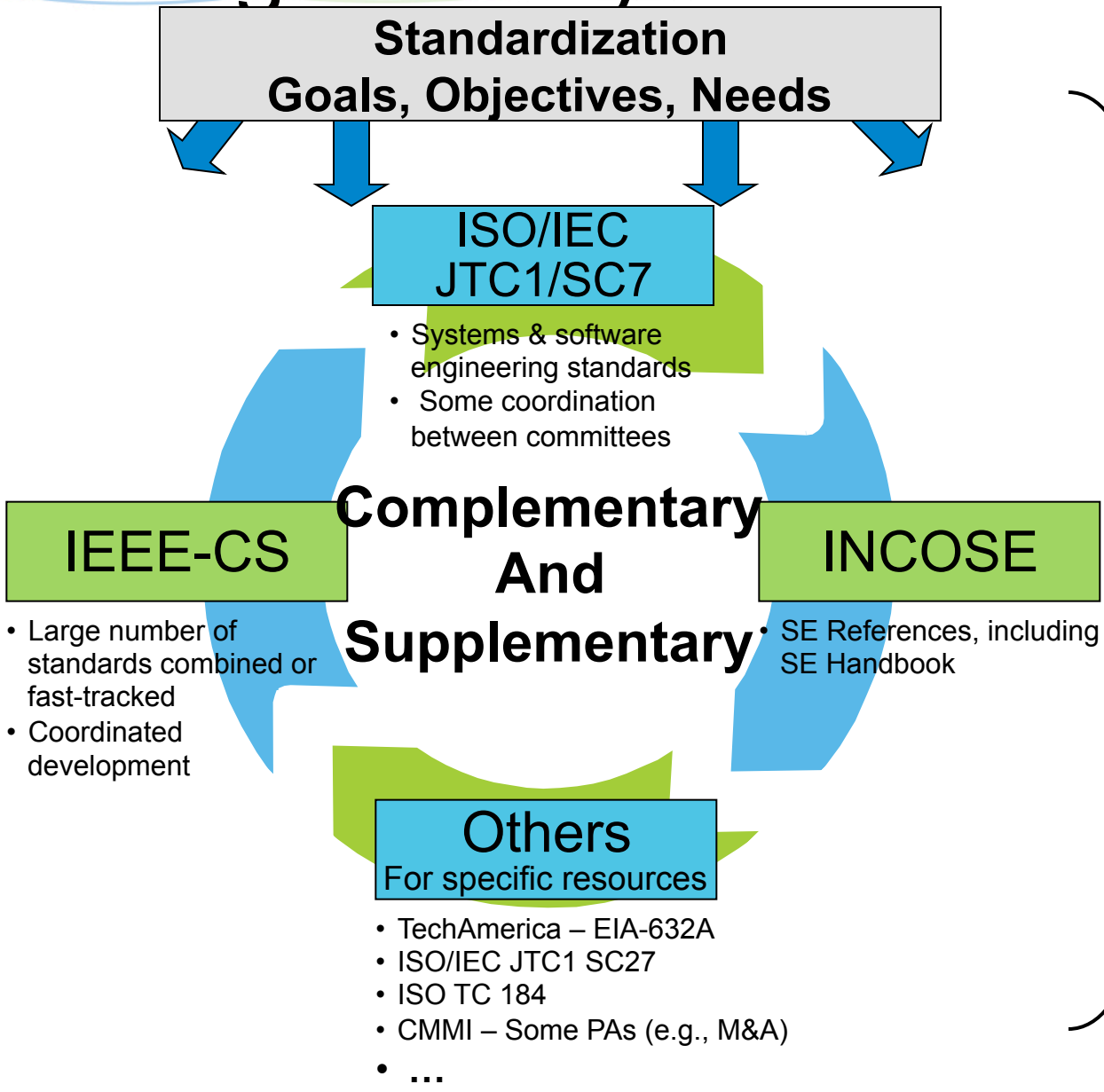
Growing Industry Collaboration



SEBoK
SWEBoK

- SE Body of Knowledge
- SW Body of Knowledge

Vocabularies

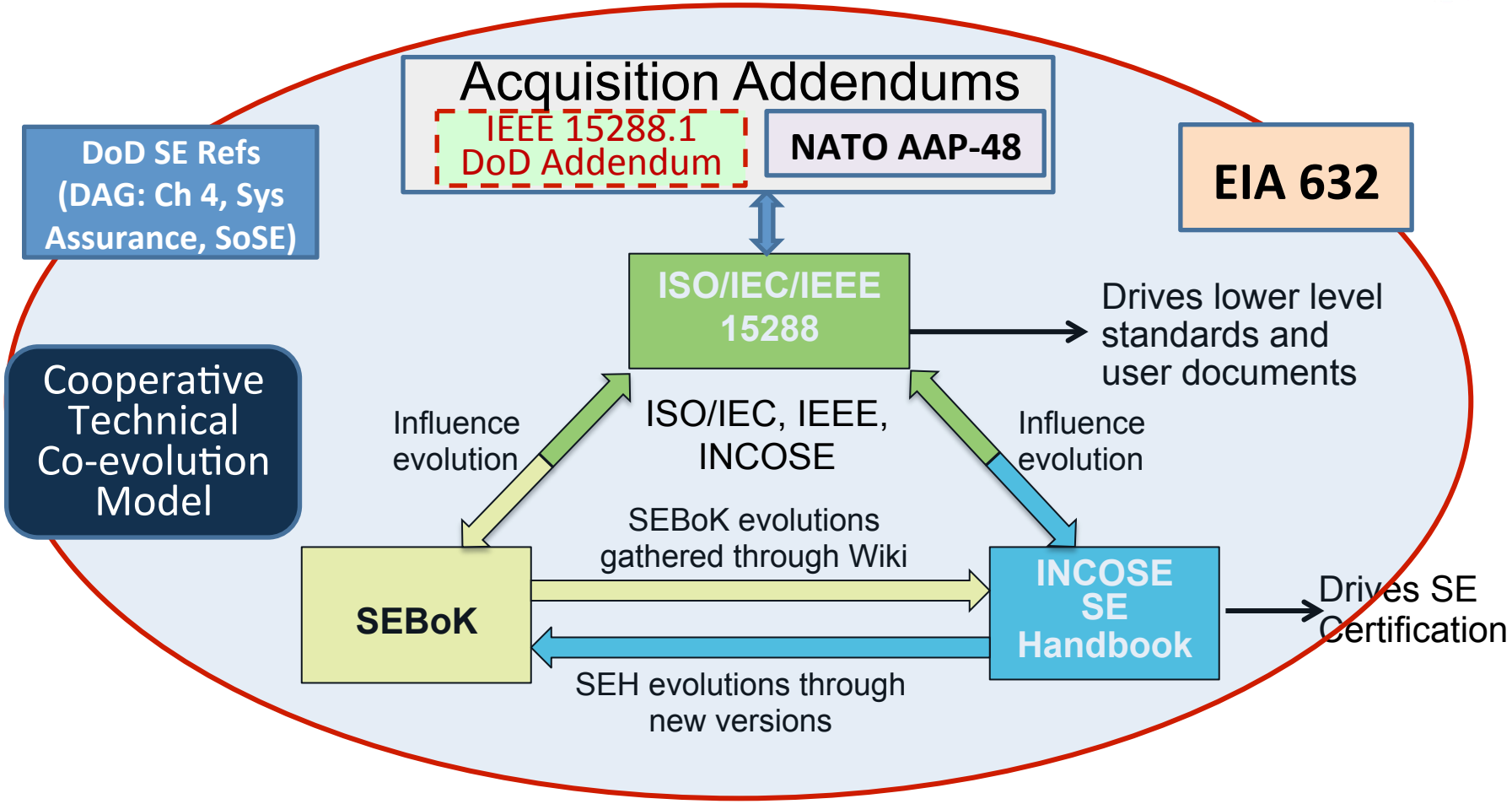
- SE & SW Processes SEVOCAB

Influence other key SE & SW resources

Reference Curricula

- Grad Ref Curriculum for SE - GRCSE
- Grad Ref Curriculum for SW

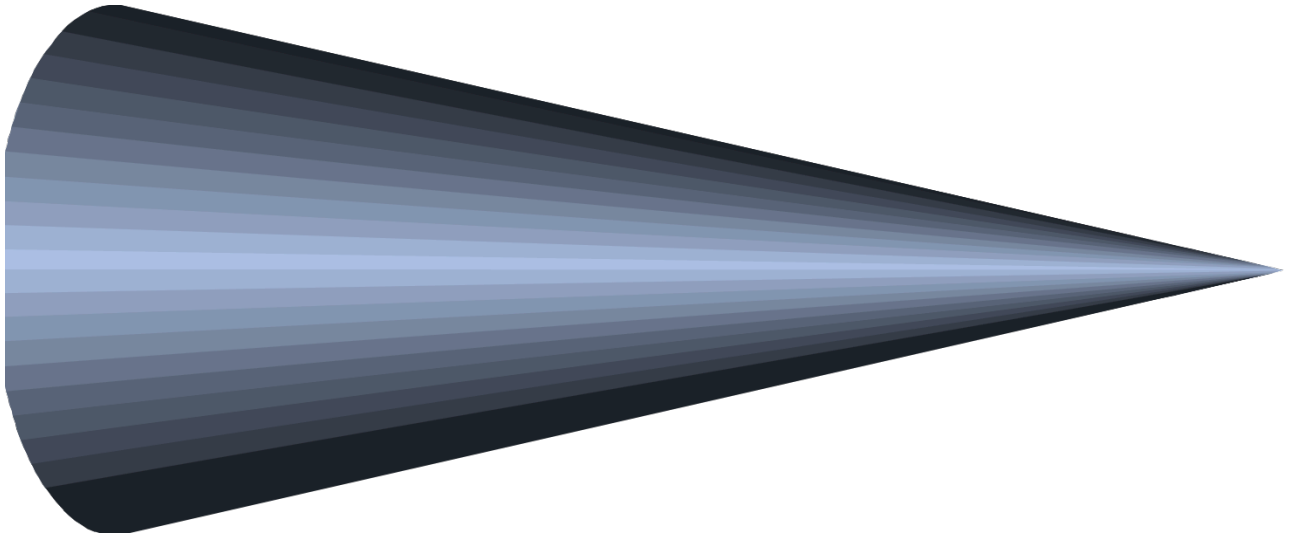
Evolution of Key SE&A Resources



Integrated evolution of the key SE resources through collaboration. Much of this evolution has occurred; growth & sustainment is necessary

Image courtesy of Garry Roedler, LMCO

Convergence of 15288 and SEH - History



2006 → **2015**

Version 3.0
- Adopted terminology
- General alignment of process structure

Version 3.2
- Adopted processes
- Same purposes and activities

Version 4.0
- Full alignment
- Terms & definitions
- Concepts
- Processes

Image courtesy of Garry Roedler, LMCO

Fourth Edition Table of Contents (1 of 2)

Fourth Edition Table of Contents (2 of 2)

Major 15288-2014 Changes Reflected in SEHv4

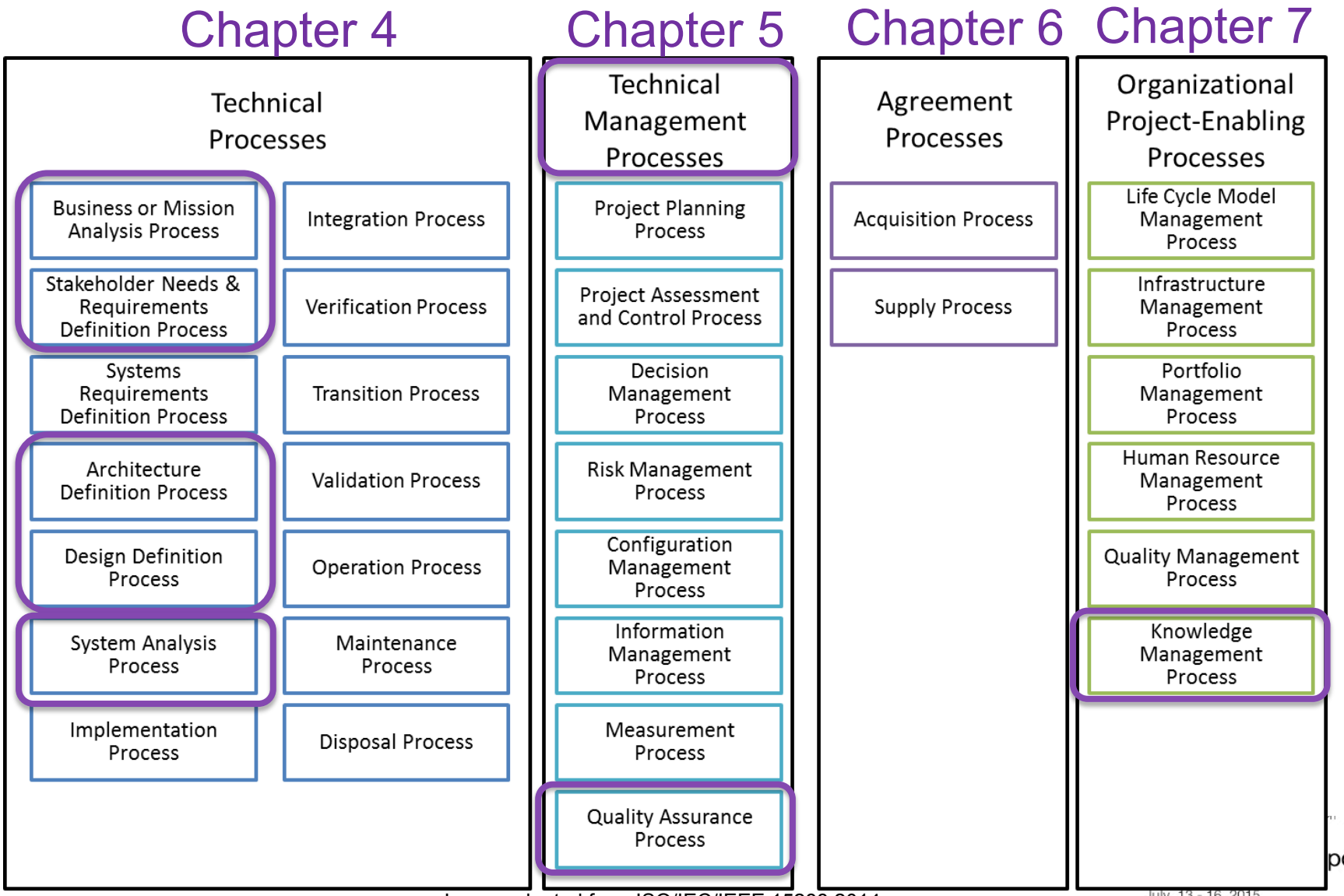


Image adapted from ISO/IEC/IEEE 15288:2014

Major Changes Reflected in SEHv4 (1 of 3)

- All Chapters
  - Updated format and content of IPO Diagrams (formerly Context Diagrams)
  - IPO diagrams based upon an updated underlying CORE model of (one instance of) the process areas
- Chapter 2: SE Overview – Added new sections:
  - 2.5 Enabling Systems
  - 2.9 - Systems Science and Systems Thinking
  - 2.10 Systems Engineering Leadership
  - 2.11 Systems Engineering Professional Development
- Chapter 3: Generic Life Cycle Stages
  - Added new section:
    - 3.4.1 - Iteration and Recursion
  - Added two new case studies:
    - 3.6.4 - Cyber Security Considerations in System Engineering
    - 3.6.5 - Design for Maintainability

Major Changes Reflected in SEHv4 (2 of 3)

- Chapter 8: Tailoring Process – Added new sections:
  - 8.2 – Tailoring for Specific Product or Domain Application
  - 8.3 – Application of SE for Product Line Management
  - 8.4 – Application of SE for Services
  - 8.5 – Application of SE for Enterprises
  - 8.6 – Application of SE for Very Small and Micro Enterprises (VSME)
- Chapter 9: Cross-Cutting SE Methods – Consolidated many existing & new topics into this new chapter (not just technical):
  - 9.1 – Modeling & Simulation
  - 9.2 – Model-Based System Engineering (MBSE)
  - 9.3 – Functions-Based SE (FBSE)
  - 9.4 – Object-Oriented SE (OOSE)
  - 9.5 – Prototyping
  - 9.6 – Interface Management
  - 9.7 – Integrated Product and Process Development
  - 9.8 – Lean SE
  - 9.9 – Agile SE

Major Changes Reflected in SEHv4 (3 of 3)

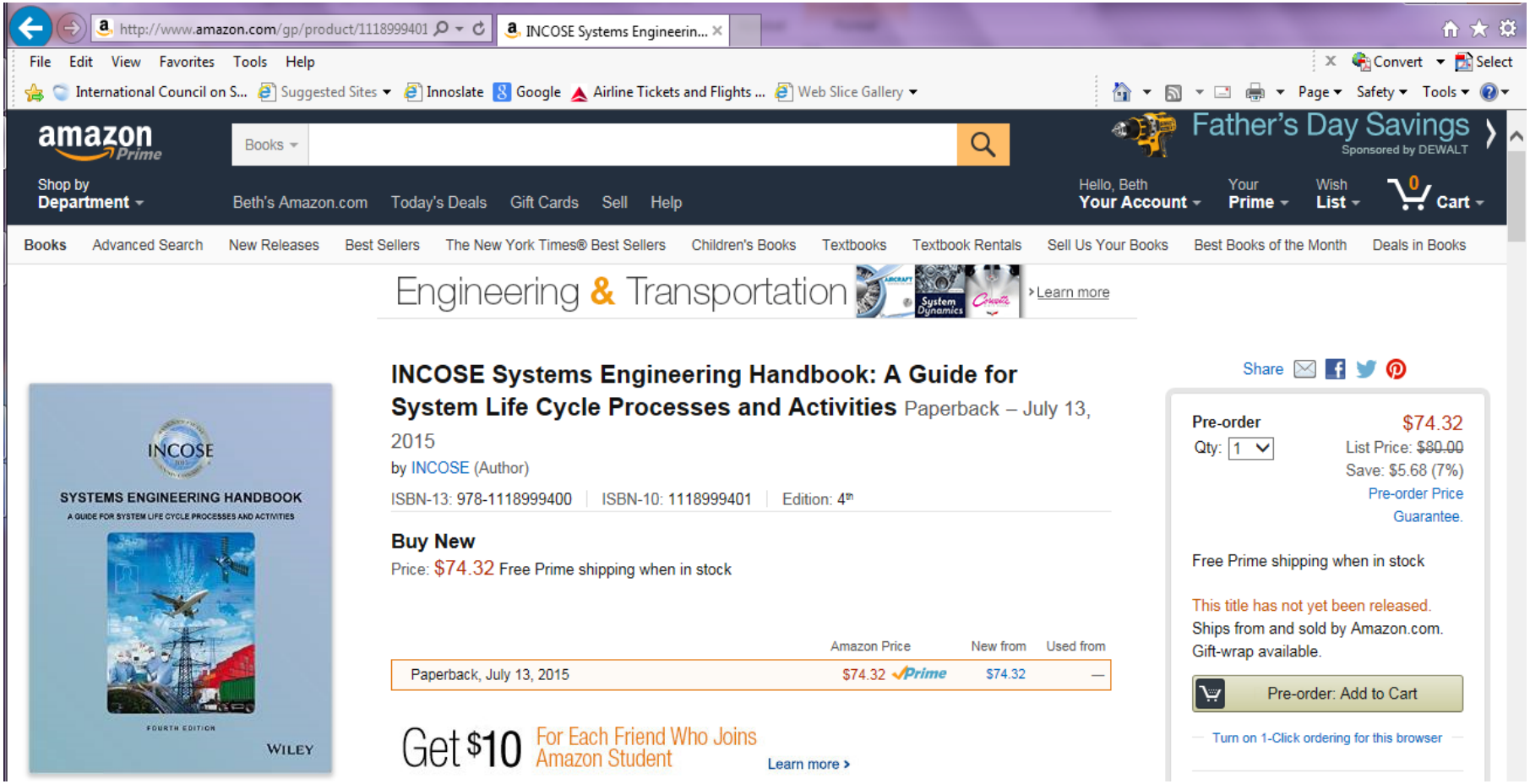
- Chapter 10: Specialty Engineering Activities – Updated, combined, and added new sections:
  - 10.2 – Affordability/Cost Effectiveness/Life-Cycle Cost Analysis
  - 10.8 – Reliability, Availability, and Maintainability
  - 10.9 – Resilience Engineering
  - 10.11 – System Security Engineering

- Appendices – New or elaborated:
  - A – References (SEHv3.2.2 had references distributed by chapter; Version 4 has references in a single appendix)
  - E – Input-Output descriptions, removed from the text body and put into Appendix E

Publication Details

- INCOSE has reached agreement with John Wiley & Sons to publish SEHv4
  - Softcopy PDF format will continue to be available free to INCOSE members and CAB organizations
  - Hardcopy can be purchased after 13 July 2015 through Wiley channels (instead of INCOSE Central as in the past)
  - Electronic book versions to be available (through Wiley channels) for iPad, Kindle, Nook, etc.
  - Translation into other languages can be facilitated by INCOSE Central and Wiley working with local chapters
- Publication delayed to follow 15288 release
  - Release of ISO/IEC/IEEE 15288:2015 was May 2015
  - Release of SEHv4 will be 13 July 2015
  - Also corresponds to INCOSE's 25th Anniversary Symposium

Amazon Page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