

Seminar on ISO/IEC/IEEE 15288:2015 Systems and Software Engineering -- System Life Cycle Processes

Harold “Bud” Lawson



IEEE COMPUTER SOCIETY
CHARLES BABBAGE
COMPUTER PIONEER



FELLOW



FELLOW and LIFE MEMBER



FELLOW



ISO/IEC 15288

Need and Fundamental Concepts

Harold “Bud” Lawson
Lawson Konsult AB, Syntell AB

An Important Happening

In 1994, then-Secretary of Defense, Dr. William Perry, issued a memorandum, known as the “Perry memo,” directing the use of performance and commercial specifications and standards in lieu of military specifications and standards, unless no practical alternative existed to meet the user’s needs.

Observation Promoted by Raghu Singh

You can never discuss Software without considering the Systems Context In which the Software is an Element.

A Standard on Systems Engineering Processes is needed to Complement ISO/IEC 12207.

Original Purpose and Goal (Why?)

- **The purpose of the standard is to define a generic, top level framework consisting of the processes needed for acquiring, supplying, developing, [operating], and maintaining systems.**
- **The goal is to:**
 - **Improve interaction between system components.**
 - **Establish a framework for a system.**
 - **Improve quality of related processes, such as development, operation and maintenance.**

Source: *Project Requirements - System Life Cycle Processes*
ISO/IEC JTC1/SC7 N1385, June 19th, 1995

Measurable Requirements (What)

- Define a system life cycle that integrates software life cycle
- Define a system architecture that integrates different components.
- Define processes and related tasks and the requirements for outputs (e.g. products)
- Define what tasks need to be performed, not how they would be performed
- Ensure the standard is independent of technologies
- Provide interfaces with other relevant standards
- Ensure the standard is culturally independent (supporting cultural requirements)
- Provide for process improvement.

Source: *Project Requirements - System Life Cycle Processes*
ISO/IEC JTC1/SC7 N1385, June 19th, 1995

Customers (Who)

- **The standard will promote consistent and uniform terminology among various engineering disciplines. The standard will establish interfaces and improved communication between various engineering disciplines needed to produce quality systems.**
 - **Information technology engineers**
 - **System engineers (and integrators)**
 - **Hardware engineers**
 - **Software engineers**
 - **Acquirers of system products and services**
 - **Suppliers of system products and services**

Source: *Project Requirements - System Life Cycle Processes*
ISO/IEC JTC1/SC7 N1385, June 19th, 1995

Expected Use (Where?)

- **The standard is expected to be used during the acquisition, supply, development, operation, and maintenance of systems that contain software.**
- **The standard is expected to be used as quality assurance and process improvement.**
- **The standard will be used in two-party agreements, internally by an organization , and as a self-imposed standard by a person.**

Source: *Project Requirements - System Life Cycle Processes*
ISO/IEC JTC1/SC7 N1385, June 19th, 1995

Prague May 1996

Start of Project the led to 15288

- **Four members of SC7 WG7 assigned to establish concepts and principles**
 - **Stuart Arnold (at that time DERA)**
 - **Richard Schmidt (Editor of IEEE 1220)**
 - **Jerry Lake**
 - **Bud Lawson**
- **The Convenor Raghu Singh appointed Arnold and Schmidt as Co-editors**

Stan Magee Takes Over

- **The New Convener takes ACTION in Curitiba, Brazil – Spring 1999**
 - **Dismisses Richard Schmidt**
 - **Stuart Arnold – Sole Editor**
 - **Identified Need for an Architect to work with the editor and keep the project on track**
 - **Bud Lawson elected as architect**

The Sigtuna Meeting

- **Stuart Arnold and Bud Lawson met at the latter's summer house in Sept. 1999**
- **Established the Concepts**
 - **System of Interest,**
 - **System Elements,**
 - **Recursive Decomposition,**
 - **Enabling Systems,**
 - **Life Cycle Models,**
 - **Stages,**
 - **Processes**



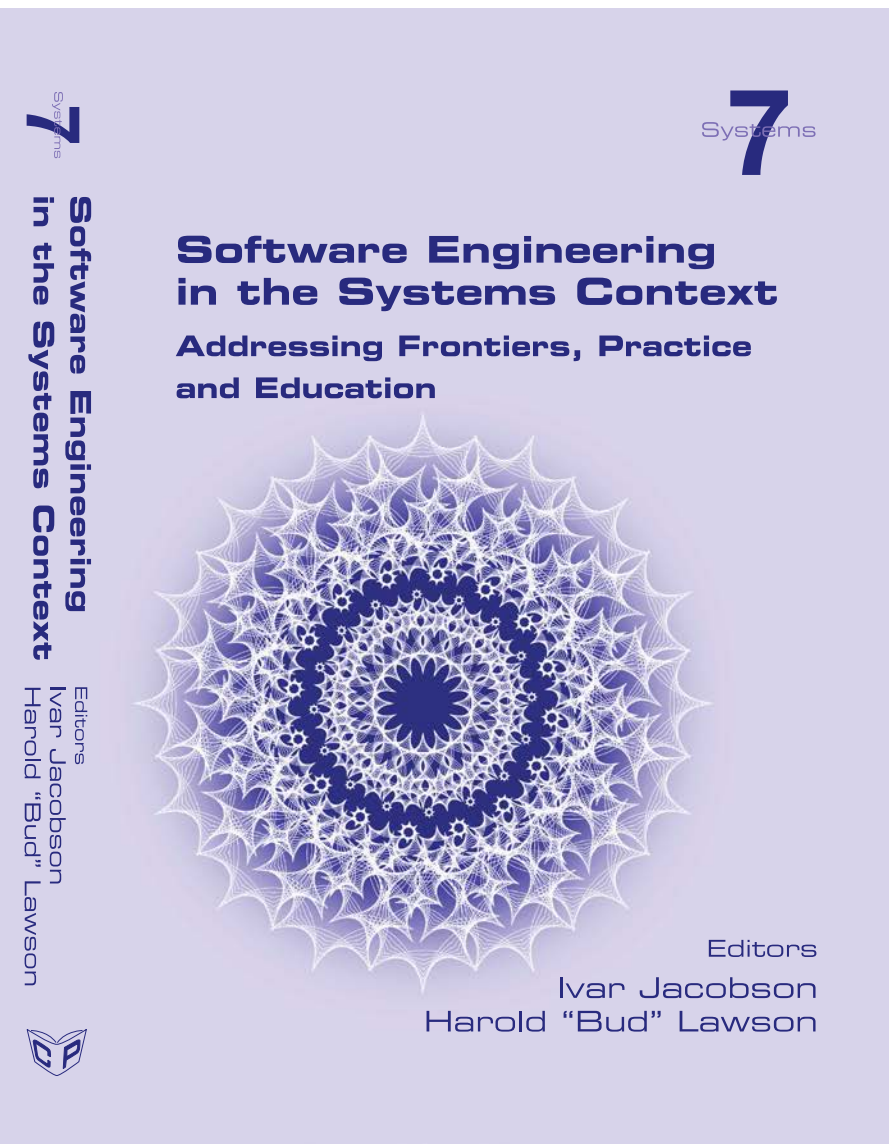
The Tough Road to a Standard

- Arnold and Lawson defend the concepts
- Standard went through several updates as Working Drafts, Committee Drafts, Draft International Standard
- Let's not create a Blivit – P Length Test
- Finally Approved in 2002



THE CAST

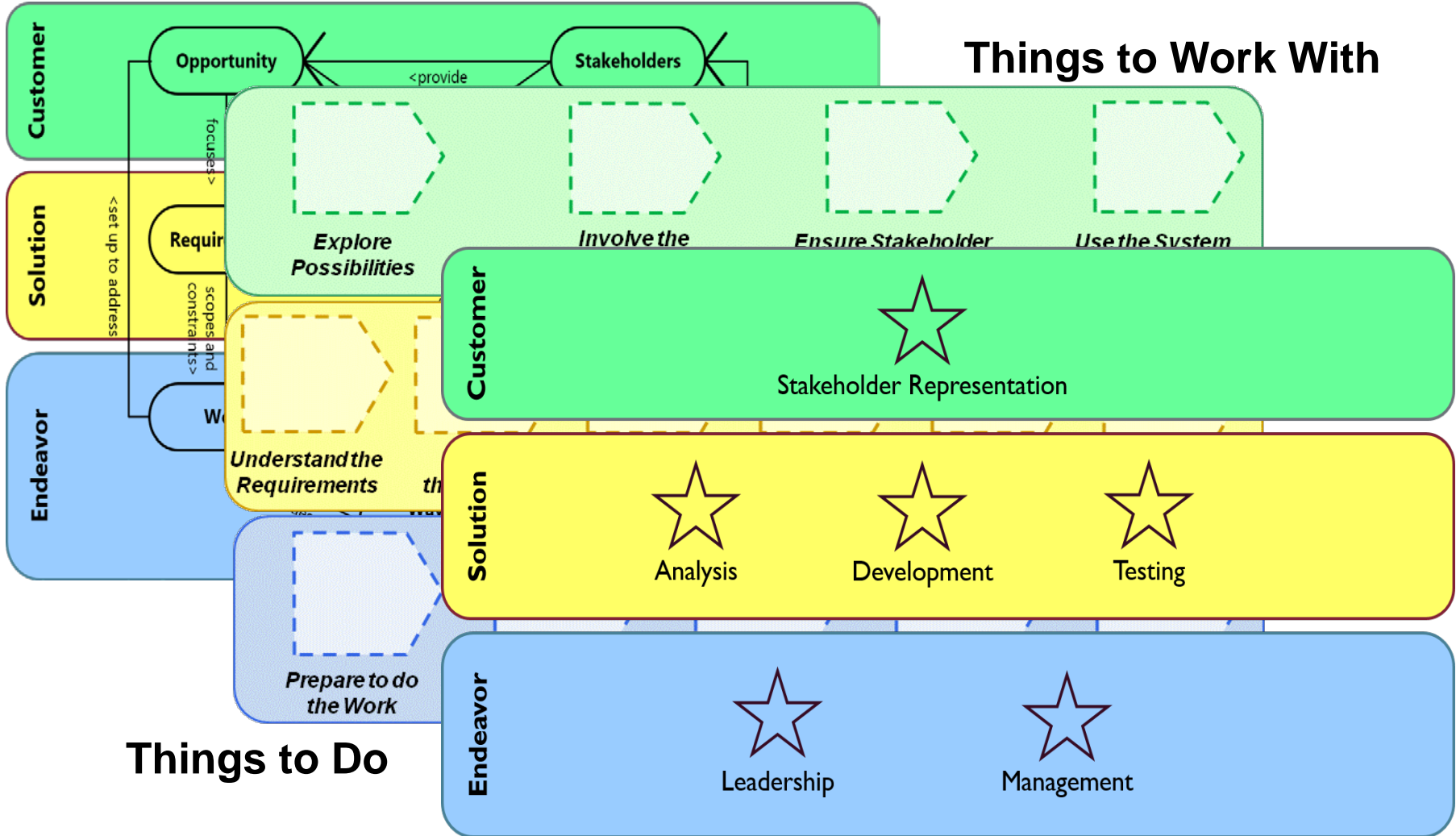
Ilia Bider Barry Boehm Lindsey Brodie
Francois Coallier Tom Gilb
Rich Hilliard Ivar Jacobson
Harold “Bud” Lawson Anatoly Levenchuk
Svante Lidman Paul E. McMahon
Moacyr de Mello Barry Myburgh
Pan-Wei Ng Don O’Neill
June Sung Park Sarah Sheard
Ian Sommerville Ian Spence



A MUST READ FOR ALL SOFTWARE AND SYSTEMS ENGINEERS!!!

Essence Kernel

A Framework for Thinking and Acting



The Competencies Needed

Exploring and Defining Software – Systems Relationships

- driving concepts and principles
- guidance on selecting development approaches
- issues of complexity
- stakeholder concerns and requirements
- the vital role of architecture
- agility, governance
- resilience, trust, risk
- acquisition, supply chains
- technical debt
- socio-technical aspects
- standards
- fundamental aspects of improving communication and understanding

CALL FOR ACTION – STRIVE TOWARDS UNIFYING SOFTWARE AND SYSTEMS ENGINEERING

A SYSTEMS ENGINEERING ESSENCE KERNEL

....

These twenty-two chapters express a huge breadth of perspective, as the practices used by different developers and teams can vary quite widely. But now, with ESSENCE, they can be compared, observed, metered and integrated in a much more straightforward fashion, as long as those practices which make up each methodology are defined using the standard ESSENCE kernel.

That's a huge accomplishment, and an important one for any organization, project manager or developer working in software development, systems analysis or any other engineering field. This book is for you.

Dr. Richard Mark Soley, Chairman and Chief Executive Officer
Object Management Group, Inc.