A Conceptual Model of ICT Interoperability

A Presentation by:

John L. Hill

Sun Microsystems

To Cover

- Identify a problem and suggest a solution

- Propose formulation of index of interoperability as a solution

- Discuss implications

Problem Description

- ICT solutions today often consume more time and money than a more ideal situation.

- Likely causes seem to be:
  - absence of a definition of 'interoperability'
  - diversity of interoperability goals

- Result is that end user receives suboptimal value.

Inadequate Definition

- 'Interoperability' is a concept for which disparate, pseudo definitions have arisen.

  – *Interoperability refers to the ability of two or more systems (computers, communication devices, networks, software, and other information technology components) to interact with one another and exchange data according to a prescribed method in order to achieve predictable results.*

  – *Interoperability is the ability to exchange information .. and to use it.*

Inadequate Definition

- Implied:
  - Boolean (Yes/No) valued system attribute

- Proposed:
  - Interoperability is a real-valued attribute that applies to a wide range of relationships among ICT processing entities.

Disparate Goals

- Achieving full interoperability requires addressing complex relationships:
  - Execution speed vs. functionality
  - Multiple vs. single point of entry (failure)
  - Integrate vs. interface
- A way to tailor interoperability goals to situations is needed.

Conceptual Model

$$V = \frac{\sum_{i=1}^{n} (E_i * M_i)}{\sum_{i=1}^{n} M_i}$$

Where:
V = the value of the index of interoperability
i = the interoperability function number
n = the number of interoperability functions
E = the extent to which an interoperability function is provided (0 ≤E ≤ 1)
M = the importance of the interoperability function

Implications

- For every 'system' the index value can account for multiple factors having differing importance.

- A premium can be placed on some interoperability factors.

- Academic research is necessary
    - the nature
    - requirements
    - methods
    - confirmation

Summary

- Interoperability is a complex system attribute whose value is best described on a scale.

- A conceptual model to calculate an index of interoperability exists in a primitive form.

- The importance of interoperability demands additional research.