

Requirements Management Tools and Techniques for Lawmaking

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System Engineering-Inspired Law Making

- Technology Systems VS Social Systems
- Significant Differences
 - No materials
 - May not retire (may last indefinitely)
 - Logistics
 - Need continuous reinforcement VS maintenance
 - Human to Human and Human to Institution VS User-Machine Interactions
 - Problem Solving: Court, Trials VS Maintenance and Repair

System Engineering-Inspired Law Making

- Foundation on Requirements
- Critical Operational Issues
- Requirements Validation and Verification
- System Test and Evaluation
- Approval, Amendment, or Rejection

CRITICAL OPERATIONAL ISSUES

- LIBERTY AND JUSTICE FOR ALL

CRITICAL OPERATIONAL ISSUES

- The ideal law of government shall***:
- Be simply stated and have clear meaning.
- Be completely successful in achieving its objective(s).
- Interacts synergistically with other laws.
- Produce no detrimental side effect.
- Optimally serves the purpose of democracy.

***The End of Chaos; Quality Laws and the Ascendancy of Democracy. David G. Schunk, 2005, ISBN 0-9770660-0-25

Quality Requirements Statements

- Requirement statements shall be:
 - Necessary
 - Implementation independent
 - Unambiguous
 - Complete
 - Singular
 - Feasible
 - Verifiable
 - Correct
 - Conforming

Requirements Elicitation

- The United States Constitution as Amended
- Precedents from the doctrine of Stare Decisis
 - The case by case foundation of Common Law System
 - Pros and Cons
- Common Sense
- New Circumstances
- Activist Group Demands
- Unexpected Events
- Environmental Threats
- Importance of Education

A Law Life Cycle



Traceability

- Does the law, as written, satisfy the statement of needs and initial fundamental requirements?
- Is the law, once approved, properly enforced?
- Is the law observed?
- Does the law in operation meet its original objectives?
- Is there any negative side effects related to the enforcement of the law?
- Should the law be kept as is, modified, or retracted?
- What are the long term benefits of the Law (evaluated as measure of effectiveness (MOE))

Making a Point

Requirements Verification: A Simple Example on non-compliance.

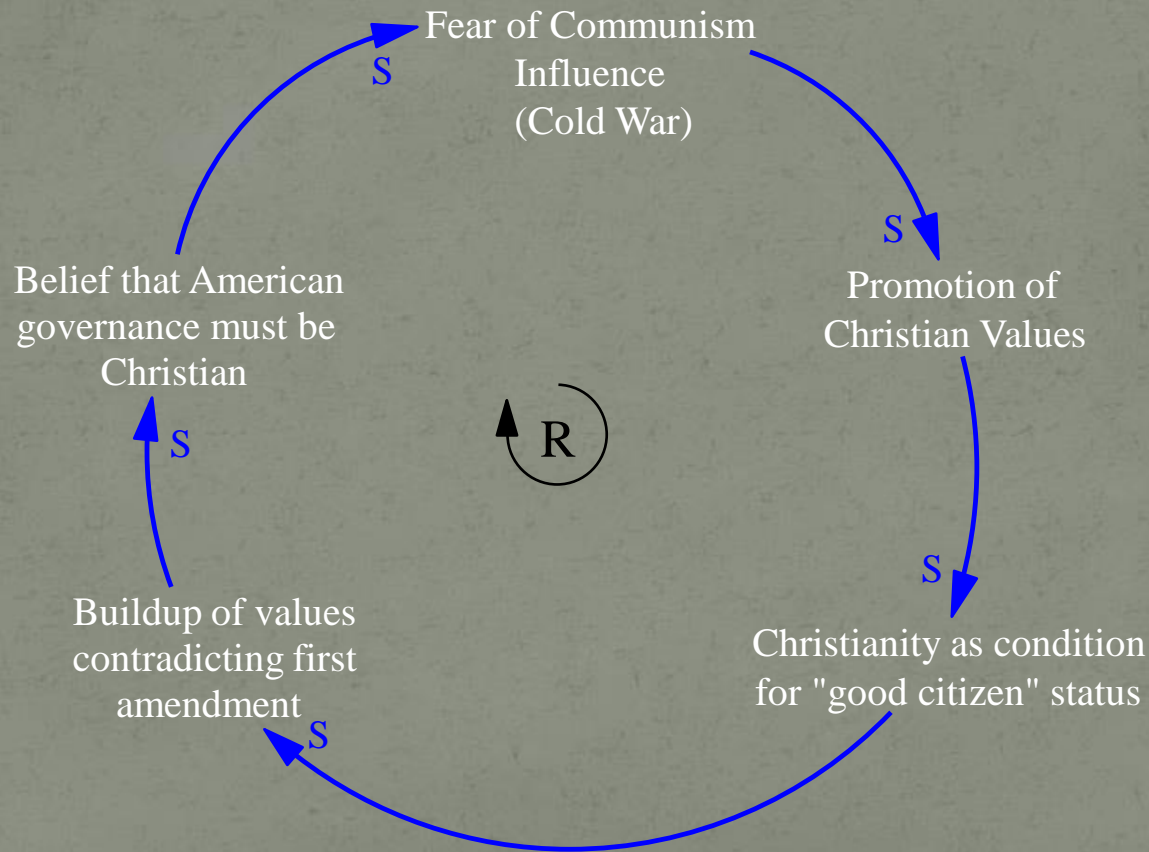
The American Constitution

- *First Amendment:*
- *“Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.”*

The Pledge of Allegiance

- 1892:
 - *“I pledge allegiance to my Flag and the Republic for which it stands, one nation, indivisible, with liberty and justice for all.”*
- 1923:
 - *“I pledge allegiance to the Flag of the United States of America and to the Republic for which it stands, one nation, indivisible, with liberty and justice for all.”*
- 1954:
 - *“I pledge allegiance to the flag of the United States of America, and to the republic for which it stands, one nation, under God, indivisible, with liberty and justice for all.”*
- **NEWER IS NOT NECESSARILY BETTER**

Simple Causal Loop Diagram



Three Simple Examples

1. New Drugs must be FDA approved prior to entering public market.
2. Second amendment to the constitution.
3. Bill H.R 185

FDA Approval of a Drug

- Law is well observed and enforced.
- The law offers the benefits of protecting customer's health and safety.
- Negative but necessary side effect: very costly. V&V programs for drugs represent 95% of the total development life cycle. In the world of systems engineering that is quite outstanding.
- This law is likely to survive for an indefinite period of time.
- New therapies will necessitate new procedures and law will be amended accordingly.

The Second Amendment to the Constitution

- A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed.
- Side effects: People can use arms to commit murder.
 - Single incidents
 - Mass murders at: school, college, theaters.
 - For this reason several groups challenge the enforcement of the second amendment.

The Second Amendment – An Opinion

- Criminals will always find a way to get arms.
- Legalizing the sale and the bearing of arms prevent the establishment of a stronger black market.
- Good citizen shall not be deprived of a basic right to defend themselves.
- The second amendment shall remain in full force and effect for an indefinite period of time.
- It is OK to prohibit sale of arms to people with criminal records.

Bill H.R. 185 The Regulatory Accountability Act

- If approved, would require federal agencies formulating new regulations to adopt “the least costly ruled considered during the rule making” in almost all cases.
- 3,500 new federal regulations – Laws – enacted every year without the direct approval of congress.

The Classic Triple Constraints

- SCOPE
 - BUDGET
 - TIME
-
- What will it take?